SEQUENCE LISTING

<110> Umoja Biopharma, Inc.
Scharenberg, Andrew
Beitz, Laurie

<120> VECTOR SYSTEM FOR DELIVERY OF MULTIPLE POLYNUCLEOTIDES AND USES THEREOF

<130> UMOJ-008/01WO

<150> US 63/116,611
<151> 2020-11-20

<160> 33

<170> PatentIn version 3.5

<210> 1
<211> 90
<212> PRT
<213> Artificial Sequence

<220>
<223> FRB domain

<400> 1

Met Glu Met Trp His Glu Gly Leu Glu Glu Ala Ser Arg Leu Tyr Phe
1 5 10 15

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

Ala Met Met Glu Arg Gly Pro Gln Thr Leu Lys Glu Thr Ser Phe Asn
35 40 45

Gln Ala Tyr Gly Arg Asp Leu Met Glu Ala Gln Glu Trp Cys Arg Lys
50 55 60

Tyr Met Lys Ser Gly Asn Val Lys Asp Leu Thr Gln Ala Trp Asp Leu
65 70 75 80

Tyr Tyr His Val Phe Arg Arg Ile Ser Lys
85 90

<210> 2

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

<220>
<223> FRB domain

<400> 2

Met Glu Met Trp His Glu Gly Leu Glu Glu Ala Ser Arg Leu Tyr Phe
1 5 10 15

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

Ala Met Met Glu Arg Gly Pro Gln Thr Leu Lys Glu Thr Ser Phe Asn
35 40 45

Gln Ala Tyr Gly Arg Asp Leu Met Glu Ala Gln Glu Trp Cys Arg Lys
50 55 60

Tyr Met Lys Ser Gly Asn Val Lys Asp Leu Leu Gln Ala Trp Asp Leu
65 70 75 80

Tyr Tyr His Val Phe Arg Arg Ile Ser Lys
85 90

<210> 3
<211> 353
<212> PRT
<213> Artificial Sequence

<220>
<223> MND Promoter

<400> 3

Gly Ala Ala Cys Ala Gly Ala Gly Ala Ala Ala Cys Ala Gly Gly Ala
1 5 10 15

Gly Ala Ala Thr Ala Thr Gly Gly Gly Cys Cys Ala Ala Ala Cys Ala
20 25 30

Gly Gly Ala Thr Ala Thr Cys Thr Gly Thr Gly Gly Thr Ala Ala Gly
35 40 45

```
Cys Ala Gly Thr Thr Cys Cys Thr Gly Cys Cys Cys Cys Gly Gly Cys
    50                  55                  60

Thr Cys Ala Gly Gly Gly Cys Cys Ala Ala Gly Ala Ala Cys Ala Gly
65                  70                  75                  80

Thr Thr Gly Gly Ala Ala Cys Ala Gly Cys Ala Gly Ala Ala Thr Ala
                85                  90                  95

Thr Gly Gly Gly Cys Cys Ala Ala Ala Cys Ala Gly Gly Ala Thr Ala
            100                 105                 110

Thr Cys Thr Gly Thr Gly Gly Thr Ala Ala Gly Cys Ala Gly Thr Thr
        115                 120                 125

Cys Cys Thr Gly Cys Cys Cys Cys Gly Gly Cys Thr Cys Ala Gly Gly
    130                 135                 140

Gly Cys Cys Ala Ala Gly Ala Ala Cys Ala Gly Ala Thr Gly Gly Thr
145                 150                 155                 160

Cys Cys Cys Cys Ala Gly Ala Thr Gly Cys Gly Gly Thr Cys Cys Cys
                165                 170                 175

Gly Cys Cys Cys Thr Cys Ala Gly Cys Ala Gly Thr Thr Thr Cys Thr
            180                 185                 190

Ala Gly Ala Gly Ala Ala Cys Cys Ala Thr Cys Ala Gly Ala Thr Gly
        195                 200                 205

Thr Thr Thr Cys Cys Ala Gly Gly Gly Thr Gly Cys Cys Cys Cys Ala
    210                 215                 220

Ala Gly Gly Ala Cys Cys Thr Gly Ala Ala Ala Thr Gly Ala Cys Cys
225                 230                 235                 240

Cys Thr Gly Thr Gly Cys Cys Thr Thr Ala Thr Thr Thr Gly Ala Ala
                245                 250                 255
```

```
Cys Thr Ala Ala Cys Cys Ala Ala Thr Cys Ala Gly Thr Thr Cys Gly
            260                 265                 270

Cys Thr Thr Cys Thr Cys Gly Cys Thr Thr Cys Thr Gly Thr Thr Cys
        275                 280                 285

Gly Cys Gly Cys Gly Cys Thr Thr Cys Thr Gly Cys Thr Cys Cys Cys
    290                 295                 300

Cys Gly Ala Gly Cys Thr Cys Thr Ala Thr Ala Thr Ala Ala Gly Cys
305                 310                 315                 320

Ala Gly Ala Gly Cys Thr Cys Gly Thr Thr Thr Ala Gly Thr Gly Ala
                325                 330                 335

Ala Cys Cys Gly Thr Cys Ala Gly Ala Thr Cys Gly Cys Thr Ala Gly
            340                 345                 350

Cys
```

<210> 4
<211> 251
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2Rgamma complex

<400> 4

```
Met Pro Leu Gly Leu Leu Trp Leu Gly Leu Ala Leu Leu Gly Ala Leu
1               5                   10                  15

His Ala Gln Ala Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly
            20                  25                  30

Arg Thr Phe Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly
        35                  40                  45

Met Leu Glu Asp Gly Lys Lys Phe Asp Ser Ser Arg Asp Arg Asn Lys
    50                  55                  60
```

```
Pro Phe Lys Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu
65                  70                  75                  80

Glu Gly Val Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile
                85                  90                  95

Ser Pro Asp Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro
            100                 105                 110

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

Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe Leu Phe Ala Leu Glu Ala
    130                 135                 140

Val Val Ile Ser Val Gly Ser Met Gly Leu Ile Ile Ser Leu Leu Cys
145                 150                 155                 160

Val Tyr Phe Trp Leu Glu Arg Thr Met Pro Arg Ile Pro Thr Leu Lys
                165                 170                 175

Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly Asn Phe Ser Ala Trp
            180                 185                 190

Ser Gly Val Ser Lys Gly Leu Ala Glu Ser Leu Gln Pro Asp Tyr Ser
        195                 200                 205

Glu Arg Leu Cys Leu Val Ser Glu Ile Pro Pro Lys Gly Gly Ala Leu
    210                 215                 220

Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn Gln His Ser Pro Tyr Trp
225                 230                 235                 240

Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu Thr
                245                 250
```

<210> 5
<211> 429
<212> PRT

<213> Artificial Sequence

<220>
<223> IL2Rbeta cmplex

<400> 5

```
Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1               5                  10                  15


His Ala Ala Arg Pro Ile Leu Trp His Glu Met Trp His Glu Gly Leu
            20                  25                  30


Glu Glu Ala Ser Arg Leu Tyr Phe Gly Glu Arg Asn Val Lys Gly Met
        35                  40                  45


Phe Glu Val Leu Glu Pro Leu His Ala Met Met Glu Arg Gly Pro Gln
    50                  55                  60


Thr Leu Lys Glu Thr Ser Phe Asn Gln Ala Tyr Gly Arg Asp Leu Met
65                  70                  75                  80


Glu Ala Gln Glu Trp Cys Arg Lys Tyr Met Lys Ser Gly Asn Val Lys
                85                  90                  95


Asp Leu Leu Gln Ala Trp Asp Leu Tyr Tyr His Val Phe Arg Arg Ile
            100                 105                 110


Ser Lys Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu Val Gly
        115                 120                 125


Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn
    130                 135                 140


Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr
145                 150                 155                 160


Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly
                165                 170                 175


Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser
            180                 185                 190
```

```
Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg
        195                 200                 205

Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro
    210                 215                 220

Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln
225                 230                 235                 240

Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys
                245                 250                 255

Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu
            260                 265                 270

Gly Val Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro
        275                 280                 285

Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp
    290                 295                 300

Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser
305                 310                 315                 320

Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser
                325                 330                 335

Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro
            340                 345                 350

Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu
        355                 360                 365

Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg
    370                 375                 380

Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe
385                 390                 395                 400
```

Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser
405 410 415

Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
420 425

<210> 6
<211> 108
<212> PRT
<213> Artificial Sequence

<220>
<223> FKBP domain

<400> 6

Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly Arg Thr Phe Pro
1 5 10 15

Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly Met Leu Glu Asp
20 25 30

Gly Lys Lys Phe Asp Ser Ser Arg Asp Arg Asn Lys Pro Phe Lys Phe
35 40 45

Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu Glu Gly Val Ala
50 55 60

Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile Ser Pro Asp Tyr
65 70 75 80

Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro Pro His Ala Thr
85 90 95

Leu Val Phe Asp Val Glu Leu Leu Lys Leu Gly Glu
100 105

<210> 7

<400> 7
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<210> 8

<400> 8
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<210> 9

<400> 9
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<210> 10

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<210> 17

<400> 17
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<210> 18
<211> 153
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2

<400> 18

Met Tyr Arg Met Gln Leu Leu Ser Cys Ile Ala Leu Ser Leu Ala Leu
1 5 10 15

Val Thr Asn Ser Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu
20 25 30

Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile
35 40 45

Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe
50 55 60

Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu
65 70 75 80

Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys
85 90 95

Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile
100 105 110

Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala
115 120 125

Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe
130 135 140

Cys Gln Ser Ile Ile Ser Thr Leu Thr
145 150

<210> 19
<211> 177
<212> PRT
<213> Artificial Sequence

<220>
<223> IL7

<400> 19

```
Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile
1               5                  10                  15

Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys
            20                  25                  30

Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu
        35                  40                  45

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe
    50                  55                  60

Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe
65                  70                  75                  80

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser
                85                  90                  95

Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr
            100                 105                 110

Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala
        115                 120                 125

Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu
    130                 135                 140

Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu
145                 150                 155                 160

Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu
                165                 170                 175

His
```

<210> 20
<211> 162

<212> PRT
<213> Artificial Sequence

<220>
<223> IL-15

<400> 20

Met Arg Ile Ser Lys Pro His Leu Arg Ser Ile Ser Ile Gln Cys Tyr
1 5 10 15

Leu Cys Leu Leu Leu Asn Ser His Phe Leu Thr Glu Ala Gly Ile His
20 25 30

Val Phe Ile Leu Gly Cys Phe Ser Ala Gly Leu Pro Lys Thr Glu Ala
35 40 45

Asn Trp Val Asn Val Ile Ser Asp Leu Lys Lys Ile Glu Asp Leu Ile
50 55 60

Gln Ser Met His Ile Asp Ala Thr Leu Tyr Thr Glu Ser Asp Val His
65 70 75 80

Pro Ser Cys Lys Val Thr Ala Met Lys Cys Phe Leu Leu Glu Leu Gln
85 90 95

Val Ile Ser Leu Glu Ser Gly Asp Ala Ser Ile His Asp Thr Val Glu
100 105 110

Asn Leu Ile Ile Leu Ala Asn Asn Ser Leu Ser Ser Asn Gly Asn Val
115 120 125

Thr Glu Ser Gly Cys Lys Glu Cys Glu Glu Leu Glu Glu Lys Asn Ile
130 135 140

Lys Glu Phe Leu Gln Ser Phe Val His Ile Val Gln Met Phe Ile Asn
145 150 155 160

Thr Ser

<210> 21

<211> 271
<212> PRT
<213> Artificial Sequence

<220>
<223> membrane IL7

<400> 21

```
Met Ala His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile
1               5                   10                  15


Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys
            20                  25                  30


Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu
        35                  40                  45


Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe
    50                  55                  60


Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe
65                  70                  75                  80


Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser
                85                  90                  95


Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr
            100                 105                 110


Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala
        115                 120                 125


Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu
    130                 135                 140


Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu
145                 150                 155                 160


Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu
                165                 170                 175
```

```
His Ser Gly Gly Gly Ser Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro
            180                 185                 190

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
        195                 200                 205

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
    210                 215                 220

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
225                 230                 235                 240

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn
                245                 250                 255

His Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val
            260                 265                 270
```

<210> 22
<211> 256
<212> PRT
<213> Artificial Sequence

<220>
<223> membrane IL-15

<400> 22

```
Met Gly Leu Val Arg Arg Gly Ala Arg Ala Gly Pro Arg Met Pro Arg
1               5                   10                  15

Gly Trp Thr Ala Leu Cys Leu Leu Ser Leu Leu Pro Ser Gly Phe Met
            20                  25                  30

Ala Gly Ile His Val Phe Ile Leu Gly Cys Phe Ser Ala Gly Leu Pro
        35                  40                  45

Lys Thr Glu Ala Asn Trp Val Asn Val Ile Ser Asp Leu Lys Lys Ile
    50                  55                  60

Glu Asp Leu Ile Gln Ser Met His Ile Asp Ala Thr Leu Tyr Thr Glu
65                  70                  75                  80
```

```
Ser Asp Val His Pro Ser Cys Lys Val Thr Ala Met Lys Cys Phe Leu
                85                  90                  95

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

Asp Thr Val Glu Asn Leu Ile Ile Leu Ala Asn Asn Ser Leu Ser Ser
        115                 120                 125

Asn Gly Asn Val Thr Glu Ser Gly Cys Lys Glu Cys Glu Glu Leu Glu
    130                 135                 140

Glu Lys Asn Ile Lys Glu Phe Leu Gln Ser Phe Val His Ile Val Gln
145                 150                 155                 160

Met Phe Ile Asn Thr Ser Ser Pro Ala Lys Pro Thr Thr Thr Pro Ala
                165                 170                 175

Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser
            180                 185                 190

Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr
        195                 200                 205

Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala
    210                 215                 220

Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys
225                 230                 235                 240

Asn His Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val
                245                 250                 255
```

<210> 23
<211> 251
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2Rgamma complex

<400> 23

```
Met Pro Leu Gly Leu Leu Trp Leu Gly Leu Ala Leu Leu Gly Ala Leu
1               5                  10                  15

His Ala Gln Ala Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly
            20                  25                  30

Arg Thr Phe Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly
        35                  40                  45

Met Leu Glu Asp Gly Lys Lys Phe Asp Ser Ser Arg Asp Arg Asn Lys
    50                  55                  60

Pro Phe Lys Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu
65                  70                  75                  80

Glu Gly Val Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile
                85                  90                  95

Ser Pro Asp Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro
            100                 105                 110

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

Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe Leu Phe Ala Leu Glu Ala
    130                 135                 140

Val Val Ile Ser Val Gly Ser Met Gly Leu Ile Ile Ser Leu Leu Cys
145                 150                 155                 160

Val Tyr Phe Trp Leu Glu Arg Thr Met Pro Arg Ile Pro Thr Leu Lys
                165                 170                 175

Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly Asn Phe Ser Ala Trp
            180                 185                 190

Ser Gly Val Ser Lys Gly Leu Ala Glu Ser Leu Gln Pro Asp Tyr Ser
        195                 200                 205
```

Glu Arg Leu Cys Leu Val Ser Glu Ile Pro Pro Lys Gly Gly Ala Leu
210 215 220

Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn Gln His Ser Pro Tyr Trp
225 230 235 240

Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu Thr
245 250

<210> 24
<211> 251
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2Rgamma complex

<400> 24

Met Pro Leu Gly Leu Leu Trp Leu Gly Leu Ala Leu Leu Gly Ala Leu
1 5 10 15

His Ala Gln Ala Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly
20 25 30

Arg Thr Phe Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly
35 40 45

Met Leu Glu Asp Gly Lys Lys Phe Asp Ser Ser Arg Asp Arg Asn Lys
50 55 60

Pro Phe Lys Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu
65 70 75 80

Glu Gly Val Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile
85 90 95

Ser Pro Asp Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro
100 105 110

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

```
Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe Leu Phe Ala Leu Glu Ala
    130                 135                 140

Val Val Ile Ser Val Gly Ser Met Gly Leu Ile Ile Ser Leu Leu Cys
145                 150                 155                 160

Val Tyr Phe Trp Leu Glu Arg Thr Met Pro Arg Ile Pro Thr Leu Lys
                165                 170                 175

Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly Asn Phe Ser Ala Trp
            180                 185                 190

Ser Gly Val Ser Lys Gly Leu Ala Glu Ser Leu Gln Pro Asp Tyr Ser
        195                 200                 205

Glu Arg Leu Cys Leu Val Ser Glu Ile Pro Pro Lys Gly Gly Ala Leu
    210                 215                 220

Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn Gln His Ser Pro Tyr Trp
225                 230                 235                 240

Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu Thr
                245                 250
```

<210> 25
<211> 251
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2Rgamma complex

<400> 25

```
Met Pro Leu Gly Leu Leu Trp Leu Gly Leu Ala Leu Leu Gly Ala Leu
1               5                   10                  15

His Ala Gln Ala Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly
            20                  25                  30

Arg Thr Phe Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly
```

35 40 45

Met Leu Glu Asp Gly Lys Lys Phe Asp Ser Ser Arg Asp Arg Asn Lys
50 55 60

Pro Phe Lys Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu
65 70 75 80

Glu Gly Val Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile
85 90 95

Ser Pro Asp Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro
100 105 110

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

Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe Leu Phe Ala Leu Glu Ala
130 135 140

Val Val Ile Ser Val Gly Ser Met Gly Leu Ile Ile Ser Leu Leu Cys
145 150 155 160

Val Tyr Phe Trp Leu Glu Arg Thr Met Pro Arg Ile Pro Thr Leu Lys
165 170 175

Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly Asn Phe Ser Ala Trp
180 185 190

Ser Gly Val Ser Lys Gly Leu Ala Glu Ser Leu Gln Pro Asp Tyr Ser
195 200 205

Glu Arg Leu Cys Leu Val Ser Glu Ile Pro Pro Lys Gly Gly Ala Leu
210 215 220

Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn Gln His Ser Pro Tyr Trp
225 230 235 240

Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu Thr
245 250

<210> 26
<211> 429
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2Ebeta complex

<400> 26

```
Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1               5                  10                  15


His Ala Ala Arg Pro Ile Leu Trp His Glu Met Trp His Glu Gly Leu
            20                  25                  30


Glu Glu Ala Ser Arg Leu Tyr Phe Gly Glu Arg Asn Val Lys Gly Met
        35                  40                  45


Phe Glu Val Leu Glu Pro Leu His Ala Met Met Glu Arg Gly Pro Gln
    50                  55                  60


Thr Leu Lys Glu Thr Ser Phe Asn Gln Ala Tyr Gly Arg Asp Leu Met
65                  70                  75                  80


Glu Ala Gln Glu Trp Cys Arg Lys Tyr Met Lys Ser Gly Asn Val Lys
                85                  90                  95


Asp Leu Leu Gln Ala Trp Asp Leu Tyr Tyr His Val Phe Arg Arg Ile
            100                 105                 110


Ser Lys Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu Val Gly
        115                 120                 125


Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn
    130                 135                 140


Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr
145                 150                 155                 160


Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly
```

```
                165                 170                 175

Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser
            180                 185                 190

Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg
        195                 200                 205

Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro
    210                 215                 220

Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln
225                 230                 235                 240

Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys
                245                 250                 255

Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu
            260                 265                 270

Gly Val Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro
        275                 280                 285

Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp
    290                 295                 300

Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser
305                 310                 315                 320

Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser
                325                 330                 335

Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro
            340                 345                 350

Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu
        355                 360                 365

Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg
    370                 375                 380
```

Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe
385 390 395 400

Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser
405 410 415

Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
420 425

<210> 27
<211> 429
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2Rbeta complex

<400> 27

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

His Ala Ala Arg Pro Ile Leu Trp His Glu Met Trp His Glu Gly Leu
20 25 30

Glu Glu Ala Ser Arg Leu Tyr Phe Gly Glu Arg Asn Val Lys Gly Met
35 40 45

Phe Glu Val Leu Glu Pro Leu His Ala Met Met Glu Arg Gly Pro Gln
50 55 60

Thr Leu Lys Glu Thr Ser Phe Asn Gln Ala Tyr Gly Arg Asp Leu Met
65 70 75 80

Glu Ala Gln Glu Trp Cys Arg Lys Tyr Met Lys Ser Gly Asn Val Lys
85 90 95

Asp Leu Leu Gln Ala Trp Asp Leu Tyr Tyr His Val Phe Arg Arg Ile
100 105 110

Ser Lys Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu Val Gly

```
        115                 120                 125

Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn
    130                 135                 140

Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr
145                 150                 155                 160

Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly
                165                 170                 175

Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser
            180                 185                 190

Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg
        195                 200                 205

Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro
    210                 215                 220

Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln
225                 230                 235                 240

Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys
                245                 250                 255

Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu
            260                 265                 270

Gly Val Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro
        275                 280                 285

Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp
    290                 295                 300

Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser
305                 310                 315                 320

Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser
                325                 330                 335
```

```
Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro
            340                 345                 350

Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu
        355                 360                 365

Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg
    370                 375                 380

Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe
385                 390                 395                 400

Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser
                405                 410                 415

Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
            420                 425


<210>  28
<211>  429
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  IL2Rbeta complex

<400>  28

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1               5                   10                  15

His Ala Ala Arg Pro Ile Leu Trp His Glu Met Trp His Glu Gly Leu
            20                  25                  30

Glu Glu Ala Ser Arg Leu Tyr Phe Gly Glu Arg Asn Val Lys Gly Met
        35                  40                  45

Phe Glu Val Leu Glu Pro Leu His Ala Met Met Glu Arg Gly Pro Gln
    50                  55                  60

Thr Leu Lys Glu Thr Ser Phe Asn Gln Ala Tyr Gly Arg Asp Leu Met
```

```
                                        25
65                  70                  75                  80

Glu Ala Gln Glu Trp Cys Arg Lys Tyr Met Lys Ser Gly Asn Val Lys
                85                  90                  95

Asp Leu Leu Gln Ala Trp Asp Leu Tyr Tyr His Val Phe Arg Arg Ile
            100                 105                 110

Ser Lys Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu Val Gly
        115                 120                 125

Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn
    130                 135                 140

Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr
145                 150                 155                 160

Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly
                165                 170                 175

Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser
            180                 185                 190

Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg
        195                 200                 205

Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro
    210                 215                 220

Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln
225                 230                 235                 240

Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys
                245                 250                 255

Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu
            260                 265                 270

Gly Val Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro
        275                 280                 285
```

```
Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp
    290                 295                 300

Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser
305                 310                 315                 320

Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser
                325                 330                 335

Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro
            340                 345                 350

Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu
        355                 360                 365

Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg
    370                 375                 380

Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe
385                 390                 395                 400

Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser
                405                 410                 415

Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
            420                 425
```

<210> 29
<211> 429
<212> PRT
<213> Artificial Sequence

<220>
<223> IL7Ralpha complex

<400> 29

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Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1               5                   10                  15

His Ala Ala Arg Pro Ile Leu Trp His Glu Met Trp His Glu Gly Leu
```

```
            20                  25                  30

Glu Glu Ala Ser Arg Leu Tyr Phe Gly Glu Arg Asn Val Lys Gly Met
        35                  40                  45

Phe Glu Val Leu Glu Pro Leu His Ala Met Met Glu Arg Gly Pro Gln
    50                  55                  60

Thr Leu Lys Glu Thr Ser Phe Asn Gln Ala Tyr Gly Arg Asp Leu Met
65                  70                  75                  80

Glu Ala Gln Glu Trp Cys Arg Lys Tyr Met Lys Ser Gly Asn Val Lys
                85                  90                  95

Asp Leu Leu Gln Ala Trp Asp Leu Tyr Tyr His Val Phe Arg Arg Ile
            100                 105                 110

Ser Lys Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu Val Gly
        115                 120                 125

Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn
    130                 135                 140

Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr
145                 150                 155                 160

Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly
                165                 170                 175

Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser
            180                 185                 190

Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg
        195                 200                 205

Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro
    210                 215                 220

Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln
225                 230                 235                 240
```

```
Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys
                245                 250                 255

Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu
            260                 265                 270

Gly Val Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro
        275                 280                 285

Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp
    290                 295                 300

Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser
305                 310                 315                 320

Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser
                325                 330                 335

Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro
            340                 345                 350

Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu
        355                 360                 365

Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg
    370                 375                 380

Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe
385                 390                 395                 400

Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser
                405                 410                 415

Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
            420                 425
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<210> 30
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<400> 30

Gly Gly Gly Ser
1

<210> 31
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<213> Artificial Sequence

<220>
<223> glycine spacer

<400> 31

Gly Gly Gly Ser Gly Gly Gly
1 5

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

<220>
<223> glycine spacer

<400> 32

Gly Gly Gly
1

<210> 33
<211> 429
<212> PRT
<213> Artificial Sequence

<220>
<223> IL2Ralpha complex

<400> 33

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

```
                                          30
His Ala Ala Arg Pro Ile Leu Trp His Glu Met Trp His Glu Gly Leu
            20                  25                  30

Glu Glu Ala Ser Arg Leu Tyr Phe Gly Glu Arg Asn Val Lys Gly Met
        35                  40                  45

Phe Glu Val Leu Glu Pro Leu His Ala Met Met Glu Arg Gly Pro Gln
    50                  55                  60

Thr Leu Lys Glu Thr Ser Phe Asn Gln Ala Tyr Gly Arg Asp Leu Met
65                  70                  75                  80

Glu Ala Gln Glu Trp Cys Arg Lys Tyr Met Lys Ser Gly Asn Val Lys
                85                  90                  95

Asp Leu Leu Gln Ala Trp Asp Leu Tyr Tyr His Val Phe Arg Arg Ile
            100                 105                 110

Ser Lys Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu Val Gly
        115                 120                 125

Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn
    130                 135                 140

Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr
145                 150                 155                 160

Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly
                165                 170                 175

Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser
            180                 185                 190

Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg
        195                 200                 205

Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro
    210                 215                 220

Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln
```

225 230 235 240

Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys
245 250 255

Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu
260 265 270

Gly Val Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro
275 280 285

Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp
290 295 300

Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser
305 310 315 320

Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser
325 330 335

Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro
340 345 350

Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu
355 360 365

Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg
370 375 380

Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe
385 390 395 400

Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser
405 410 415

Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
420 425