SEQUENCE LISTING

<110> Scharenberg, Andrew M.
Rawlings, David J.
Sommer, Karen
West, Samuel
Honaker, Yuchi Chiang
Takeuchi, Ryo

<120> Rapamycin Resistant Cells

<130> SCRI.186WO

<150> US 62/663,562
<151> 2018-04-27

<160> 58

<170> PatentIn version 3.5

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20 25 30

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35 40 45

Gln Ala Tyr Gly Arg Asp Leu Met Glu Ala Gln Glu Trp Cys Arg Lys
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Tyr Met Lys Ser Gly Asn Val Lys Asp Leu Thr Gln Ala Trp Asp Leu
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35 40 45

Gln Ala Tyr Gly Arg Asp Leu Met Glu Ala Gln Glu Trp Cys Arg Lys
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Tyr Met Lys Ser Gly Asn Val Lys Asp Leu Leu Gln Ala Trp Asp Leu
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Tyr Tyr His Val Phe Arg Arg Ile Ser Lys
85 90

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aagcagttcc tgccccggct cagggccaag aacagatggt ccccagatgc ggtcccgccc 180

tcagcagttt ctagagaacc atcagatgtt tccagggtgc cccaaggacc tgaaatgacc 240

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<213> Artificial sequence

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<220>
<221> misc_feature
<223> micro-DISC DNA (cytoplasmic tail only; codon diverged)

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tggctgaaaa aagtgctcaa gtgtaatacc cccgacccaa gcaagttctt ctcccagctt 180

tcttcagagc atggaggcga tgtgcagaaa tggctctctt caccttttcc ctcctcaagc 240

ttctccccgg gagggctggc gcccgagatt tcacctcttg aggtacttga acgagacaag 300

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<210> 5
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<223> Synthetic polypeptide

<220>
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<223> micro-DISC polypeptide (cytoplasmic tail only)

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Pro Ala Ala Leu Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu
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Val Gly Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu
20 25 30

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Ile Asn Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys
        35                  40                  45

Asn Thr Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His
    50                  55                  60

Gly Gly Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser
65                  70                  75                  80

Phe Ser Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu
                85                  90                  95

Glu Arg Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro
            100                 105                 110

Glu Pro Ala Ser Leu Ser Leu Asn Thr Asp Ala Tyr Leu Ser Leu Gln
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Glu Leu Gln
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<210> 6
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<220>
<223> Synthetic polypeptide

<220>
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<223> FKBP CISC domain

<400> 6

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Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly Met Leu Glu Asp
            20                  25                  30
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```
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
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<210>  7
<211>  245
<212>  PRT
<213>  Artificial sequence

<220>
<223>  Synthetic polypeptide

<220>
<221>  misc_feature
<223>  Entire micro-DISC polypeptide (FRB-truncated IL2Rbeta)

<400>  7

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

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

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

Lys Cys Asn Thr Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser
                165                 170                 175

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

Ser Ser Phe Ser Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu
        195                 200                 205

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

Val Pro Glu Pro Ala Ser Leu Ser Leu Asn Thr Asp Ala Tyr Leu Ser
225                 230                 235                 240

Leu Gln Glu Leu Gln
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<210> 8
<211> 3623

<212> DNA
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tcagcagttt ctagagaacc atcagatgtt tccagggtgc cccaaggacc tgaaatgacc 240

ctgtgcctta tttgaactaa ccaatcagtt cgcttctcgc ttctgttcgc gcgcttctgc 300

tccccgagct ctatataagc agagctcgtt tagtgaaccg tcagatcgct agcaccggtg 360

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cccaggccgg cgtgcaggtg gagacaatct ccccaggcga cggacgcaca ttccctaagc 480

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<210> 9
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<223> IL2Rgamma-CISC polypeptide

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Met Pro Leu Gly Leu Leu Trp Leu Gly Leu Ala Leu Leu Gly Ala Leu
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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
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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
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<210> 10
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            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
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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 Glu Gly
        115                 120                 125

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

Leu His Lys Leu Ser Glu Ser Gln Leu Glu Leu Asn Trp Asn Asn Arg
145                 150                 155                 160

Phe Leu Asn His Cys Leu Glu His Leu Val Gln Tyr Arg Thr Asp Trp
                165                 170                 175

Asp His Ser Trp Thr Glu Gln Ser Val Asp Tyr Arg His Lys Phe Ser
            180                 185                 190

Leu Pro Ser Val Asp Gly Gln Lys Arg Tyr Thr Phe Arg Val Arg Ser
        195                 200                 205

Arg Phe Asn Pro Leu Cys Gly Ser Ala Gln His Trp Ser Glu Trp Ser
    210                 215                 220

His Pro Ile His Trp Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe Leu
225                 230                 235                 240

Phe Ala Leu Glu Ala Val Val Ile Ser Val Gly Ser Met Gly Leu Ile
                245                 250                 255

Ile Ser Leu Leu Cys Val Tyr Phe Trp Leu Glu Arg Thr Met Pro Arg
            260                 265                 270

Ile Pro Thr Leu Lys Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly
        275                 280                 285

Asn Phe Ser Ala Trp Ser Gly Val Ser Lys Gly Leu Ala Glu Ser Leu
    290                 295                 300
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```
Gln Pro Asp Tyr Ser Glu Arg Leu Cys Leu Val Ser Glu Ile Pro Pro
305                 310                 315                 320


Lys Gly Gly Ala Leu Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn Gln
                325                 330                 335


His Ser Pro Tyr Trp Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu Thr
            340                 345                 350


<210>  11
<211>  349
<212>  PRT
<213>  Artificial sequence

<220>
<223>  Synthetic polypeptide

<220>
<221>  misc_feature
<223>  IL2Rgamma-CISC polypeptide

<400>  11

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 Glu Gly
        115                 120                 125

Gln Asn Leu Val Ile Pro Trp Ala Pro Glu Asn Leu Thr Leu His Lys
    130                 135                 140

Leu Ser Glu Ser Gln Leu Glu Leu Asn Trp Asn Asn Arg Phe Leu Asn
145                 150                 155                 160

His Cys Leu Glu His Leu Val Gln Tyr Arg Thr Asp Trp Asp His Ser
                165                 170                 175

Trp Thr Glu Gln Ser Val Asp Tyr Arg His Lys Phe Ser Leu Pro Ser
            180                 185                 190

Val Asp Gly Gln Lys Arg Tyr Thr Phe Arg Val Arg Ser Arg Phe Asn
        195                 200                 205

Pro Leu Cys Gly Ser Ala Gln His Trp Ser Glu Trp Ser His Pro Ile
    210                 215                 220

His Trp Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe Leu Phe Ala Leu
225                 230                 235                 240

Glu Ala Val Val Ile Ser Val Gly Ser Met Gly Leu Ile Ile Ser Leu
                245                 250                 255

Leu Cys Val Tyr Phe Trp Leu Glu Arg Thr Met Pro Arg Ile Pro Thr
            260                 265                 270

Leu Lys Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly Asn Phe Ser
        275                 280                 285
```

```
Ala Trp Ser Gly Val Ser Lys Gly Leu Ala Glu Ser Leu Gln Pro Asp
    290                 295                 300

Tyr Ser Glu Arg Leu Cys Leu Val Ser Glu Ile Pro Pro Lys Gly Gly
305                 310                 315                 320

Ala Leu Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn Gln His Ser Pro
                325                 330                 335

Tyr Trp Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu Thr
            340                 345
```

<210> 12
<211> 251
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL2Rgamma-CISC polypeptide

<400> 12

```
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 Glu Gly
        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> 13
<211> 429
<212> PRT
<213> Artificial sequence

<220>

<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL2Rbeta-CISC polypeptide

<400> 13

```
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> 14
<211> 543
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL2Rbeta-CISC polypeptide

<400> 14

```
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 Gly Ser Lys Pro Phe Glu Asn Leu Arg Leu Met Ala Pro
        115                 120                 125

Ile Ser Leu Gln Val Val His Val Glu Thr His Arg Cys Asn Ile Ser
    130                 135                 140

Trp Glu Ile Ser Gln Ala Ser His Tyr Phe Glu Arg His Leu Glu Phe
145                 150                 155                 160

Glu Ala Arg Thr Leu Ser Pro Gly His Thr Trp Glu Glu Ala Pro Leu
                165                 170                 175

Leu Thr Leu Lys Gln Lys Gln Glu Trp Ile Cys Leu Glu Thr Leu Thr
            180                 185                 190

Pro Asp Thr Gln Tyr Glu Phe Gln Val Arg Val Lys Pro Leu Gln Gly
        195                 200                 205

Glu Phe Thr Thr Trp Ser Pro Trp Ser Gln Pro Leu Ala Phe Arg Thr
    210                 215                 220

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

Leu Val Gly Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu
                245                 250                 255

Leu Ile Asn Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys
            260                 265                 270

Cys Asn Thr Pro Asp Pro Ser Lys Phe Phe Gln Leu Ser Ser Glu His
        275                 280                 285
```

```
Gly Gly Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser
    290                 295                 300

Phe Ser Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu
305                 310                 315                 320

Glu Arg Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro
                325                 330                 335

Glu Pro Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr
            340                 345                 350

Asn Gln Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu
        355                 360                 365

Ala Cys Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro
    370                 375                 380

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

Gln Pro Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg
                405                 410                 415

Asp Asp Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro
            420                 425                 430

Pro Ser Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro
        435                 440                 445

Pro Ser Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu
    450                 455                 460

Gly Pro Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro
465                 470                 475                 480
```

```
Pro Glu Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly
                485                 490                 495


Pro Arg Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly
            500                 505                 510


Glu Phe Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr
        515                 520                 525


Leu Ser Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
    530                 535                 540
```

<210> 15
<211> 541
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL2Rbeta-CISC polypeptide

<400> 15

```
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 Lys Pro Phe Glu Asn Leu Arg Leu Met Ala Pro Ile Ser Leu
        115                 120                 125

Gln Val Val His Val Glu Thr His Arg Cys Asn Ile Ser Trp Glu Ile
    130                 135                 140

Ser Gln Ala Ser His Tyr Phe Glu Arg His Leu Glu Phe Glu Ala Arg
145                 150                 155                 160

Thr Leu Ser Pro Gly His Thr Trp Glu Glu Ala Pro Leu Leu Thr Leu
                165                 170                 175

Lys Gln Lys Gln Glu Trp Ile Cys Leu Glu Thr Leu Thr Pro Asp Thr
            180                 185                 190

Gln Tyr Glu Phe Gln Val Arg Val Lys Pro Leu Gln Gly Glu Phe Thr
        195                 200                 205

Thr Trp Ser Pro Trp Ser Gln Pro Leu Ala Phe Arg Thr Lys Pro Ala
    210                 215                 220

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

Leu Ser Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn
                245                 250                 255

Cys Arg Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr
            260                 265                 270

Pro Asp Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly
        275                 280                 285
```

```
Asp Val Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser
    290                 295                 300

Pro Gly Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg
305                 310                 315                 320

Asp Lys Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro
                325                 330                 335

Ala Ser Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln
            340                 345                 350

Gly Tyr Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys
        355                 360                 365

Gln Val Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu
    370                 375                 380

Gly Val Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro
385                 390                 395                 400

Leu Ser Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp
                405                 410                 415

Leu Leu Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser
            420                 425                 430

Thr Ala Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser
        435                 440                 445

Leu Gln Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro
    450                 455                 460

Pro Thr Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu
465                 470                 475                 480
```

```
Leu Val Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg
                485                 490                 495


Glu Gly Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe
            500                 505                 510


Arg Ala Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser
        515                 520                 525


Leu Gln Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
    530                 535                 540
```

<210> 16
<211> 379
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL7Ralpha-CISC polypeptide

<400> 16

```
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 Trp Leu Gly His Leu Leu Val Gly Leu Ser
65                  70                  75                  80
```

```
Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn Cys Arg
                85                  90                  95

Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr Pro Asp
            100                 105                 110

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

Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser Pro Gly
    130                 135                 140

Gly Leu Ala Pro Glu Ile Ser Pro Leu Glu Val Leu Glu Arg Asp Lys
145                 150                 155                 160

Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro Ala Ser
                165                 170                 175

Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln Gly Tyr
            180                 185                 190

Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys Gln Val
        195                 200                 205

Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu Gly Val
    210                 215                 220

Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro Leu Ser
225                 230                 235                 240

Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp Leu Leu
                245                 250                 255

Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser Thr Ala
            260                 265                 270

Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser Leu Gln
        275                 280                 285
```

```
Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro Pro Thr
    290                 295                 300

Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu Leu Val
305                 310                 315                 320

Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg Glu Gly
                325                 330                 335

Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe Arg Ala
            340                 345                 350

Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser Leu Gln
        355                 360                 365

Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
    370                 375
```

<210> 17
<211> 345
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL7Ralpha-CISC polypeptide

<400> 17

```
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 Glu Ile Asn Asn Ser Ser Gly Glu Met Asp Pro Ile Leu
        115                 120                 125

Leu Thr Ile Ser Ile Leu Ser Phe Phe Ser Val Ala Leu Leu Val Ile
    130                 135                 140

Leu Ala Cys Val Leu Trp Lys Lys Arg Ile Lys Pro Ile Val Trp Pro
145                 150                 155                 160

Ser Leu Pro Asp His Lys Lys Thr Leu Glu His Leu Cys Lys Lys Pro
                165                 170                 175

Arg Lys Asn Leu Asn Val Ser Phe Asn Pro Glu Ser Phe Leu Asp Cys
            180                 185                 190

Gln Ile His Arg Val Asp Asp Ile Gln Ala Arg Asp Glu Val Glu Gly
        195                 200                 205

Phe Leu Gln Asp Thr Phe Pro Gln Gln Leu Glu Glu Ser Glu Lys Gln
    210                 215                 220

Arg Leu Gly Gly Asp Val Gln Ser Pro Asn Cys Pro Ser Glu Asp Val
225                 230                 235                 240
```

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

Ala Gly Asn Val Ser Ala Cys Asp Ala Pro Ile Leu Ser Ser Ser Arg
260 265 270

Ser Leu Asp Cys Arg Glu Ser Gly Lys Asn Gly Pro His Val Tyr Gln
275 280 285

Asp Leu Leu Leu Ser Leu Gly Thr Thr Asn Ser Thr Leu Pro Pro Pro
290 295 300

Phe Ser Leu Gln Ser Gly Ile Leu Thr Leu Asn Pro Val Ala Gln Gly
305 310 315 320

Gln Pro Ile Leu Thr Ser Leu Gly Ser Asn Gln Glu Glu Ala Tyr Val
325 330 335

Thr Met Ser Ser Phe Tyr Gln Asn Gln
340 345

<210> 18
<211> 4
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> Linker polypeptide

<400> 18

Gly Gly Gly Ser
1

<210> 19
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> Linker polypeptide

<400> 19

Gly Gly Gly Ser Gly Gly Gly
1   5

<210> 20
<211> 3
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> Linker polypeptide

<400> 20

Gly Gly Gly
1

<210> 21
<211> 3
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> Linker polypeptide

<400> 21

Gly Gly Ser
1

<210> 22
<211> 4
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> Linker polypeptide

<400> 22

Gly Gly Ser Pro
1

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

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL2Rgamma-CISC polypeptide

<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 Val 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 Glu Gly
        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> 443
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL2Rbeta-CISC polypeptide

<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 Val 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 Glu Gly
        115                 120                 125


Gly Lys Asp Thr Ile Pro Trp Leu Gly His Leu Leu Val Gly Leu Ser
    130                 135                 140


Gly Ala Phe Gly Phe Ile Ile Leu Val Tyr Leu Leu Ile Asn Cys Arg
145                 150                 155                 160
```

```
Asn Thr Gly Pro Trp Leu Lys Lys Val Leu Lys Cys Asn Thr Pro Asp
                165                 170                 175

Pro Ser Lys Phe Phe Ser Gln Leu Ser Ser Glu His Gly Gly Asp Val
            180                 185                 190

Gln Lys Trp Leu Ser Ser Pro Phe Pro Ser Ser Ser Phe Ser Pro Gly
        195                 200                 205

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

Val Thr Gln Leu Leu Leu Gln Gln Asp Lys Val Pro Glu Pro Ala Ser
225                 230                 235                 240

Leu Ser Ser Asn His Ser Leu Thr Ser Cys Phe Thr Asn Gln Gly Tyr
                245                 250                 255

Phe Phe Phe His Leu Pro Asp Ala Leu Glu Ile Glu Ala Cys Gln Val
            260                 265                 270

Tyr Phe Thr Tyr Asp Pro Tyr Ser Glu Glu Asp Pro Asp Glu Gly Val
        275                 280                 285

Ala Gly Ala Pro Thr Gly Ser Ser Pro Gln Pro Leu Gln Pro Leu Ser
    290                 295                 300

Gly Glu Asp Asp Ala Tyr Cys Thr Phe Pro Ser Arg Asp Asp Leu Leu
305                 310                 315                 320

Leu Phe Ser Pro Ser Leu Leu Gly Gly Pro Ser Pro Pro Ser Thr Ala
                325                 330                 335

Pro Gly Gly Ser Gly Ala Gly Glu Glu Arg Met Pro Pro Ser Leu Gln
            340                 345                 350

Glu Arg Val Pro Arg Asp Trp Asp Pro Gln Pro Leu Gly Pro Pro Thr
        355                 360                 365
```

```
Pro Gly Val Pro Asp Leu Val Asp Phe Gln Pro Pro Pro Glu Leu Val
    370                 375                 380

Leu Arg Glu Ala Gly Glu Glu Val Pro Asp Ala Gly Pro Arg Glu Gly
385                 390                 395                 400

Val Ser Phe Pro Trp Ser Arg Pro Pro Gly Gln Gly Glu Phe Arg Ala
                405                 410                 415

Leu Asn Ala Arg Leu Pro Leu Asn Thr Asp Ala Tyr Leu Ser Leu Gln
            420                 425                 430

Glu Leu Gln Gly Gln Asp Pro Thr His Leu Val
        435                 440
```

<210> 25
<211> 358
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> IL2Ralpha-CISC polypeptide

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

Ser Ile Leu Ser Phe Phe Ser Val Ala Leu Leu Val Ile Leu Ala Cys
145                 150                 155                 160

Val Leu Trp Lys Lys Arg Ile Lys Pro Ile Val Trp Pro Ser Leu Pro
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Asp His Lys Lys Thr Leu Glu His Leu Cys Lys Lys Pro Arg Lys Asn
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Leu Asn Val Ser Phe Asn Pro Glu Ser Phe Leu Asp Cys Gln Ile His
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Arg Val Asp Asp Ile Gln Ala Arg Asp Glu Val Glu Gly Phe Leu Gln
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Asp Thr Phe Pro Gln Gln Leu Glu Glu Ser Glu Lys Gln Arg Leu Gly
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Gly Asp Val Gln Ser Pro Asn Cys Pro Ser Glu Asp Val Val Ile Thr
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Pro Glu Ser Phe Gly Arg Asp Ser Ser Leu Thr Cys Leu Ala Gly Asn
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Val Ser Ala Cys Asp Ala Pro Ile Leu Ser Ser Ser Arg Ser Leu Asp
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Cys Arg Glu Ser Gly Lys Asn Gly Pro His Val Tyr Gln Asp Leu Leu
    290                 295                 300

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

Gln Ser Gly Ile Leu Thr Leu Asn Pro Val Ala Gln Gly Gln Pro Ile
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Arg Thr Phe Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly
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Met Leu Glu Asp Gly Lys Lys Val Asp Ser Ser Arg Asp Arg Asn Lys
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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
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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 Glu Gly
        115                 120                 125

Glu Ile Asn Asn Ser Ser Gly Glu Met Asp Pro Ile Leu Leu Thr Ile
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Ser Ile Leu Ser Phe Phe Ser Val Ala Leu Leu Val Ile Leu Ala Cys
145                 150                 155                 160

Val Leu Trp Lys Lys Arg Ile Lys Pro Ile Val Trp Pro Ser Leu Pro
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Asp His Lys Lys Thr Leu Glu His Leu Cys Lys Lys Pro Arg Lys Asn
            180                 185                 190

Leu Asn Val Ser Phe Asn Pro Glu Ser Phe Leu Asp Cys Gln Ile His
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Arg Val Asp Asp Ile Gln Ala Arg Asp Glu Val Glu Gly Phe Leu Gln
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Asp Thr Phe Pro Gln Gln Leu Glu Glu Ser Glu Lys Gln Arg Leu Gly
225                 230                 235                 240
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Gly Asp Val Gln Ser Pro Asn Cys Pro Ser Glu Asp Val Val Ile Thr
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Pro Glu Ser Phe Gly Arg Asp Ser Ser Leu Thr Cys Leu Ala Gly Asn
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Val Ser Ala Cys Asp Ala Pro Ile Leu Ser Ser Ser Arg Ser Leu Asp
        275                 280                 285


Cys Arg Glu Ser Gly Lys Asn Gly Pro His Val Tyr Gln Asp Leu Leu
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Leu Ser Leu Gly Thr Thr Asn Ser Thr Leu Pro Pro Pro Phe Ser Leu
305                 310                 315                 320


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

Glu Thr Ala Trp Ile Ser Leu Val Thr Ala Leu His Leu Val Leu Gly
    130                 135                 140

Leu Ser Ala Val Leu Gly Leu Leu Leu Leu Arg Trp Gln Phe Pro Ala
145                 150                 155                 160

His Tyr Arg Arg Leu Arg His Ala Leu Trp Pro Ser Leu Pro Asp Leu
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His Arg Val Leu Gly Gln Tyr Leu Arg Asp Thr Ala Ala Leu Ser Pro
            180                 185                 190

Pro Lys Ala Thr Val Ser Asp Thr Cys Glu Glu Val Glu Pro Ser Leu
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Leu Glu Ile Leu Pro Lys Ser Ser Glu Arg Thr Pro Leu Pro Leu Cys
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Ser Ser Gln Ala Gln Met Asp Tyr Arg Arg Leu Gln Pro Ser Cys Leu
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Gly Thr Met Pro Leu Ser Val Cys Pro Pro Met Ala Glu Ser Gly Ser
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<211> 4

<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic polypeptide

<220>
<221> misc_feature
<223> Linker/spacer polypeptide

<400> 31

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<210> 32
<211> 267
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic polynucleotide

<220>
<221> misc_feature
<223> Naked FRB domain nucleic acid sequence

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aagggcatgt ttgaagtcct cgaacccctt catgccatga tggaacgcgg accccagacc 120

ttgaaggaga caagttttaa ccaagcttac ggaagagacc tgatggaagc ccaggaatgg 180

tgcaggaaat acatgaaaag cgggaatgtg aaggacttga cccaagcgtg ggacctgtac 240

tatcatgtct ttaggcgcat tagtaag 267

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<211> 353
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic polynucleotide

<220>

<221> misc_feature
<223> MND promoter

<400> 33
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cggctcaggg ccaagaacag ttggaacagc agaatatggg ccaaacagga tatctgtggt 120

aagcagttcc tgccccggct cagggccaag aacagatggt ccccagatgc ggtcccgccc 180

tcagcagttt ctagagaacc atcagatgtt tccagggtgc cccaaggacc tgaaatgacc 240

ctgtgcctta tttgaactaa ccaatcagtt cgcttctcgc ttctgttcgc gcgcttctgc 300

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<210> 34
<211> 20
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<220>
<223> Synthetic polynucleotide

<220>
<221> misc_feature
<223> DICS HDR FP

<400> 34
cggcgacgtg gaagagaatc 20

<210> 35
<211> 20
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<220>
<223> Synthetic polynucleotide

<220>
<221> misc_feature
<223> DISC HDR RP

<400> 35
ggctgtggtt cagcctgact 20

<210> 36

<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic polynucleotide

<220>
<221> misc_feature
<223> DISC HDR probe (FAM)

<400> 36
aggctctccc cgacctccc 19

<210> 37
<211> 2880
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic polynucleotide

<220>
<221> misc_feature
<223> Coding sequences for 3186
(Signal-FKBP-IL2Rg-P2A-signal-FRB-IL2Rb-P2A-FRB-P2A-GFP-FOXP3
(knock-in)

<400> 37
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ggcgtgcagg tcgagacaat tagtcctggc gacggccgga cctttcctaa gcgaggacag 120

acatgcgtgg tgcactacac cggcatgctg gaagatggca agaagttcga cagcagccgg 180

gacagaaaca agcctttcaa gttcatgctg ggcaagcaag aagtgatcag aggctgggaa 240

gagggcgtcg cccagatgtc tgttggacag agagccaagc tgacaatcag ccccgattac 300

gcctatggcg ccacaggaca ccctgggatc attcctccac atgccacact ggtgttcgat 360

gtggaactgc tgaagctcgg cgaaggcagc aataccagca aagagaaccc cttcctgttc 420

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<211> 2742
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic polynucleotide

<220>
<221> misc_feature
<223> Coding sequences for 3187
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(knock-in)

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<210> 39
<211> 2715
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<223> Synthetic polynucleotide

<220>
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<223> Coding sequences for 3195
(Signal-FKBP-IL2Rg-P2A-signal-FRB-IL2Rb-P2A-FRB-P2A-FOXP3
(knock-in)

<400> 39

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acatgcgtgg tgcactacac cggcatgctg gaagatggca agaagttcga cagcagccgg 180

gacagaaaca agcctttcaa gttcatgctg ggcaagcaag aagtgatcag aggctgggaa 240

gagggcgtcg cccagatgtc tgttggacag agagccaagc tgacaatcag ccccgattac 300

gcctatggcg ccacaggaca ccctgggatc attcctccac atgccacact ggtgttcgat 360

gtggaactgc tgaagctcgg cgaaggcagc aataccagca aagagaaccc cttcctgttc 420

gccctggaag ccgtggttat cagcgtggga tctatgggcc tgatcatctc cctgctgtgc 480

gtgtacttct ggctggaacg gaccatgcct cggatcccca cactgaagaa tctggaagat 540

ctggtcaccg agtaccacgg caatttcagc gcttggagtg gcgtgtccaa aggcctggct 600

gaaagcctgc agcctgacta ctctgagaga ctgtgcctgg tgtctgagat ccctcctaaa 660

ggcggcgctc tcggagaagg accaggcgct tctccatgca atcagcacag cccttattgg 720

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gtgttccggc ggatctctaa gggcaaagac acaatccctt ggctgggcca tctgctcgtt 1200

ggactgtctg gcgccttcgg cttcatcatc ctggtgtacc tgctgatcaa ctgtcggaac 1260

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agggacaaag tgacccagct gctcctgcaa caggacaagg tgccagaacc tgccagcctg 1500

tctagcaatc acagcctgac cagctgcttt accaaccagg gctacttctt cttccatctg 1560

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<210> 46
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<210> 47
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<400> 48
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<400> 49

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<210> 50
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<210> 56

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<400> 56
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<210> 57
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<400> 58
ccgatgccca accccaggcc 20