SEQUENCE LISTING

<110> NANJING LEGEND BIOTECH CO., LTD.

<120> MULTISPECIFIC CHIMERIC ANTIGEN RECEPTORS AND USES THEREOF

<130> 14651-028-228

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<151> 2020-07-16

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<170> PatentIn version 3.5

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<400> 1

Gly Arg Thr Phe Ser Ser Tyr Asn Met Gly
1 5 10

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<400> 2

Val Val Asp Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

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<210> 3
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<223> CDR3 (Kabat) of VHH-273, huVHH-253, huVHH-256

<400> 3

Arg Val Gln Tyr Gly Ser Ser Trp Ser Gly Asp Tyr
1   5   10

<210> 4
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<400> 4

Gly Arg Thr Phe Ser Ser Tyr Asn
1   5

<210> 5
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<220>
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<400> 5

Val Val Asp Trp Ser Gly Gly Ser Pro
1   5

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<223> CDR3 (IMGT) of VHH-273, huVHH-253, huVHH-256

<400> 6

Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser Gly Asp Tyr
1   5   10

<210> 7
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<220>
<223> CDR2 (Kabat) of VHH-283

<400> 7

Ala Ile Ser Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Ser Ser Val Arg
1   5   10   15

Gly

<210> 8
<211> 12
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<220>
<223> CDR3 (Kabat) of VHH-283, VHH-313, and huVHH-260

<400> 8

Pro Ile Glu Tyr Gly Ser Ser Trp Ser Ala Asp Tyr
1   5   10

<210> 9
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<220>
<223> CDR2 (IMGT) of VHH-283, VHH-313, and huVHH-260

<400> 9

Ile Ser Trp Ser Gly Gly Ser Pro
1   5

<210> 10
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<223> CDR3 (IMGT) of VHH-283, VHH-313, and huVHH-260

<400> 10

Ala Ala Pro Ile Glu Tyr Gly Ser Ser Trp Ser Ala Asp Tyr
1   5   10

<210> 11
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<220>
<223> CDR1 (Kabat) of VHH-313 and huVHH-260

<400> 11

Gly Arg Thr Ile Ser Ser Tyr Ser Met Gly
1   5   10

<210> 12
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<220>
<223> CDR2 (Kabat) of VHH-313 and huVHH-260

<400> 12

Ala Ile Ser Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val Lys
1   5   10   15

Gly

<210> 13
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<400> 13

Gly Arg Thr Ile Ser Ser Tyr Ser
1   5

<210> 14
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<220>
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<400> 14

Ala Tyr Ile Arg Val Phe Tyr Leu Met Gly
1   5   10

<210> 15
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<220>
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<400> 15

Arg Val Thr Ala Asp Gly Phe Thr Asn His Ala Ala Ser Val Lys Gly
1   5   10   15

<210> 16
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<220>
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       huVHH-843, and huVHH-846

<400> 16

Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr
1   5   10

<210> 17
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<220>
<223> CDR1 (IMGT) of VHH-440 and VHH-653

<400> 17

Ala Tyr Ile Arg Val Phe Tyr Leu
1   5

<210> 18

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<220>
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<400> 18

Val Thr Ala Asp Gly Phe Thr
1 5

<210> 19
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<220>
<223> CDR3 (IMGT) of VHH-440, VHH-466, VHH-653, huVHH-836, huVHH-840, huVHH-843, and huVHH-846

<400> 19

Ala Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr
1 5 10

<210> 20
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<220>
<223> CDR1 (Kabat) of VHH-466, huVHH-836, huVHH-840, huVHH-843, and huVHH-846

<400> 20

Ala Asp Ile Arg Leu Phe Tyr Leu Met Gly
1 5 10

<210> 21
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<220>
<223> CDR2 (Kabat) of VHH-466

<400> 21

Arg Val Asn Ala Asp Asp Ser Ile Asn Tyr Val Ala Ser Val Lys Gly

1 5 10 15

<210> 22
<211> 8
<212> PRT
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<220>
<223> CDR1 (IMGT) of VHH-466, huVHH-836, huVHH-840, huVHH-843, and huVHH-846

<400> 22

Ala Asp Ile Arg Leu Phe Tyr Leu
1 5

<210> 23
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<220>
<223> CDR2 (IMGT) of VHH-466, huVHH-840, and huVHH-843, huVHH-846

<400> 23

Val Asn Ala Asp Asp Ser Ile
1 5

<210> 24
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<213> Artificial Sequence

<220>
<223> CDR1 (Kabat) of VHH-496, huVHH-746, and huVHH-750, huVHH-753

<400> 24

Gly Phe Thr Phe Ser Asn Tyr Pro Met Thr
1 5 10

<210> 25
<211> 17
<212> PRT
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<220>
<223> CDR2 (Kabat) of VHH-496, huVHH-746, huVHH-750, and huVHH-753

<400> 25

Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 26
<211> 5
<212> PRT
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<220>
<223> CDR3 (Kabat) of VHH-496, huVHH-746, huVHH-750, and huVHH-753

<400> 26

Trp Asp Arg Thr Leu
1 5

<210> 27
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<220>
<223> CDR1 (IMGT) of VHH-496, huVHH-746, huVHH-750, and huVHH-753

<400> 27

Gly Phe Thr Phe Ser Asn Tyr Pro
1 5

<210> 28
<211> 8
<212> PRT
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<220>
<223> CDR2 (IMGT) of VHH-496, huVHH-746, huVHH-750, and huVHH-753

<400> 28

Ile Thr Ser Gly Gly Asp Arg Pro
1 5

<210> 29
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<212> PRT
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<220>
<223> CDR3 (IMGT) of VHH-496, huVHH-746, huVHH-750, and huVHH-753

<400> 29

Ala Thr Trp Asp Arg Thr Leu
1 5

<210> 30
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<220>
<223> CDR2 (Kabat) of VHH-653

<400> 30

Arg Val Asn Ala Asp Gly Ile Thr Asn His Ala Ala Ser Val Lys Gly
1 5 10 15

<210> 31
<211> 7
<212> PRT
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<220>
<223> CDR2 (IMGT) of VHH-653

<400> 31

Val Asn Ala Asp Gly Ile Thr
1 5

<210> 32
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<212> PRT
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<220>
<223> CDR2 (Kabat) of huVHH-253

<400> 32

Ala Val Asp Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 33
<211> 8
<212> PRT
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<220>
<223> CDR2 (IMGT) of huVHH-253, huVHH-256

<400> 33

Val Asp Trp Ser Gly Gly Ser Pro
1 5

<210> 34
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (Kabat) of huVHH-836

<400> 34

Arg Val Asn Ala Asp Asp Ser Ile Ser Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> 35
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (IMGT) of huVHH-836

<400> 35

Val Asn Ala Asp Asp Ser Ile Ser
1 5

<210> 36
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (Kabat) of huVHH-840

<400> 36

Phe Val Asn Ala Asp Asp Ser Ile Tyr Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> 37
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (Kabat) of huVHH-843

<400> 37

Arg Val Asn Ala Asp Asp Ser Ile Asn Tyr Val Asp Ser Val Lys Gly
1 5 10 15

<210> 38
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (Kabat) of huVHH-846

<400> 38

Phe Val Asn Ala Asp Asp Ser Ile Asn Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> 39
<211> 121
<212> PRT
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<220>
<223> VHH-273 (amino acid)

<400> 39

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Ala Gly Gly
1 5 10 15

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

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

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Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val
    50                  55                  60

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

Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95

Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser Gly Asp Tyr Trp Gly
            100                 105                 110

Gln Gly Thr Gln Val Thr Val Ser Ser
        115                 120
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<210> 40
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<220>
<223> VHH-283 (amino acid)

<400> 40

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Gln Val Lys Leu Glu Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1               5                   10                  15

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

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

Ala Ala Ile Ser Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Ser Ser Val
    50                  55                  60

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

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


Gln Gly Thr Gln Val Thr Val Ser Ser
        115                 120


<210>  41
<211>  121
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<220>
<223>  VHH-313 (amino acid)

<400>  41

Asp Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Ala Gly Gly
1               5                   10                  15


Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg Thr Ile Ser Ser Tyr
            20                  25                  30


Ser Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Arg Phe Val
        35                  40                  45


Ala Ala Ile Ser Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val
    50                  55                  60


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


Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95


Ala Ala Pro Ile Glu Tyr Gly Ser Ser Trp Ser Ala Asp Tyr Trp Gly
            100                 105                 110


Gln Gly Thr Gln Val Thr Val Ser Ser
        115                 120


<210>  42
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<212> PRT
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<220>
<223> VHH-440 (amino acid)

<400> 42

Gln Val His Leu Met Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1   5   10   15

Ser Leu Arg Leu Ser Cys Gln Ala Ser Ala Tyr Ile Arg Val Phe Tyr
            20   25   30

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

Ala Arg Val Thr Ala Asp Gly Phe Thr Asn His Ala Ala Ser Val Lys
    50   55   60

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

Gln Met Asp Ser Met Lys Ser Glu Asp Thr Ala Val Tyr Tyr Cys Ala
                85   90   95

Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
            100   105   110

Gln Val Thr Val Ser Ser
        115

<210> 43
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-466 (amino acid)

<400> 43

Gln Val His Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1   5   10   15

```
Ser Leu Arg Leu Ser Cys Gln Ala Ser Ala Asp Ile Arg Leu Phe Tyr
            20                  25                  30

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

Ala Arg Val Asn Ala Asp Asp Ser Ile Asn Tyr Val Ala Ser Val Lys
    50                  55                  60

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

Gln Met Asp Ser Leu Lys Pro Glu Asp Thr Ala Thr Tyr Tyr Cys Ala
                85                  90                  95

Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
            100                 105                 110

Gln Val Thr Val Ser Ser
        115


<210>  44
<211>  114
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  VHH-496 (amino acid)

<400>  44

Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5                   10                  15

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

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

Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val
    50                  55                  60
```

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


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


Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Gln Val Thr Val
            100                 105                 110


Ser Ser
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<210> 45
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<220>
<223> VHH-653 (amino acid)

<400> 45

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Gln Val Lys Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1               5                   10                  15


Ser Leu Arg Leu Ser Cys Gln Ala Ser Ala Tyr Ile Arg Val Phe Tyr
            20                  25                  30


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


Ala Arg Val Asn Ala Asp Gly Ile Thr Asn His Ala Ala Ser Val Lys
    50                  55                  60


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


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


Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
            100                 105                 110
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Gln Val Thr Val Ser Ser
        115

<210> 46
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<220>
<223> huVHH-253 (amino acid)

<400> 46

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1   5   10   15

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

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

Ala Ala Val Asp Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val
    50   55   60

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

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

Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser Gly Asp Tyr Trp Gly
            100   105   110

Gln Gly Thr Leu Val Thr Val Ser Ser
        115   120

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

<220>
<223> huVHH-256 (amino acid)

<400> 47

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

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

Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser Gly Asp Tyr Trp Gly
100 105 110

Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

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

<220>
<223> huVHH-260 (amino acid)

<400> 48

Asp Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg Thr Ile Ser Ser Tyr
20 25 30

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

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Ala Ala Ile Ser Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ser Val
    50                  55                  60


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


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


Ala Ala Pro Ile Glu Tyr Gly Ser Ser Trp Ser Ala Asp Tyr Trp Gly
            100                 105                 110


Gln Gly Thr Leu Val Thr Val Ser Ser
        115                 120


<210>  49
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<220>
<223>  huVHH-746 (amino acid)

<400>  49

Gln Ile Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5                   10                  15


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


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


Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val
    50                  55                  60


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


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

Ala Thr Trp Asp Arg Thr Leu Trp Gly Gln Gly Thr Met Val Thr Val
100 105 110

Ser Ser

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

<220>
<223> huVHH-750 (amino acid)

<400> 50

Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

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

Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Met Val Thr Val
100 105 110

Ser Ser

<210> 51
<211> 114

<212> PRT
<213> Artificial Sequence

<220>
<223> huVHH-753 (amino acid)

<400> 51

Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1   5   10   15

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

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

Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val
    50   55   60

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

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

Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Leu Val Thr Val
            100   105   110

Ser Ser

<210> 52
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<220>
<223> huVHH-836 (amino acid)

<400> 52

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1   5   10   15

```
Ser Leu Arg Leu Ser Cys Ala Ala Ser Ala Asp Ile Arg Leu Phe Tyr
            20                  25                  30

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

Ala Arg Val Asn Ala Asp Asp Ser Ile Ser Tyr Ala Asp Ser Val Lys
    50                  55                  60

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

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

Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
            100                 105                 110

Leu Val Thr Val Ser Ser
        115
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<210> 53
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<220>
<223> huVHH-840 (amino acid)

<400> 53

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Gln Val Gln Leu Gln Glu Ser Gly Gly Gly Val Val Gln Pro Gly Gly
1               5                   10                  15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Ala Asp Ile Arg Leu Phe Tyr
            20                  25                  30

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

Ala Phe Val Asn Ala Asp Asp Ser Ile Tyr Tyr Ala Asp Ser Val Lys
    50                  55                  60
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Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
65                  70                  75                  80


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


Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
            100                 105                 110


Leu Val Thr Val Ser Ser
        115


<210>  54
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<220>
<223>  huVHH-843 (amino acid)

<400>  54

Gln Val His Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5                   10                  15


Ser Leu Arg Leu Ser Cys Gln Ala Ser Ala Asp Ile Arg Leu Phe Tyr
            20                  25                  30


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


Ala Arg Val Asn Ala Asp Asp Ser Ile Asn Tyr Val Asp Ser Val Lys
    50                  55                  60


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


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


Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
            100                 105                 110
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Leu Val Thr Val Ser Ser
        115

<210> 55
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<220>
<223> huVHH-846 (amino acid)

<400> 55

Gln Val His Leu Gln Glu Ser Gly Gly Gly Val Val Gln Pro Gly Gly
1   5   10   15

Ser Leu Arg Leu Ser Cys Gln Ala Ser Ala Asp Ile Arg Leu Phe Tyr
            20   25   30

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

Ala Phe Val Asn Ala Asp Asp Ser Ile Asn Tyr Ala Asp Ser Val Lys
    50   55   60

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

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

Ala Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
            100   105   110

Leu Val Thr Val Ser Ser
        115

<210> 56
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-273 (nucleic acid)

<400> 56
gaagtccagc tggtggaatc cgggggaggc ctggtgcagg caggaggctc cctgcggctg 60

tcttgcgcag caagcggaag gaccttcagc tcctacaaca tgggctggtt taggcaggca 120

ccaggcaagg agagggagtt cgtggcagtg gtggactggt ctggaggcag cccttactat 180

gccgattccg tgaagggccg gtttaccatc agccgggaca acggcaagaa tacagtgtat 240

ctgcagatga acagcctgaa gcccgaggat acagccgtgt actattgtgc cggccgggtg 300

cagtacgggt caagctggtc tggggattat tgggggcagg ggactcaggt cactgtctca 360

tca 363

<210> 57
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-283 (nucleic acid)

<400> 57
caggtcaaac tggaggaatc tgggggaggc agcgtgcagg caggaggcag cctgcggctg 60

tcctgcgccg cctctggcag gaccttcagc tcctacaaca tgggctggtt taggcaggca 120

ccaggcaagg agagggagtt cgtggcagca atctcctggt ctggaggcag cccctactat 180

gcctctagcg tgcggggccg gttcaccatc tcccgggaca acgccaagaa tacagtgtat 240

ctgcagatga acagcctgaa gcccgaggat acagccgtgt actattgtgc cgcccctatc 300

gagtacggct cttcttggtc agcagattat tggggacagg gcactcaggt cacagtctca 360

tca 363

<210> 58
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-313 (nucleic acid)

<400> 58
gatgtgcagc tggtggagag cggcggcggg ttggtgcaag ccggtggttc gctgcggttg 60

tcatgcgccg cttccggacg tacaatctct agctactcca tgggctggtt ccgccaggcc 120

cctggtaagg agcgcaggtt tgtcgcggcc atctcctggt ctggagggtc gccctattac 180

gcggacagcg tgaagggccg cttcaccatc agccgtgaca acgccaagaa cacggtttac 240

ctgcagatga actccctcaa acctgaagac accgccgtgt actactgtgc tgcaccaatt 300

gagtacggct ccagttggtc tgcggactat tggggccagg gcacccaggt caccgtgtcc 360

tct 363

<210> 59
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-440 (nucleic acid)

<400> 59
caggtccacc tgatggagag cggaggcggc tccgtgcagg ccggaggtag tctgcgcctg 60

tcatgccagg cctccgccta cattcgagtg ttctacctga tgggctggtt ccgccaggcc 120

ccggggaagg agcgcgagga ggtggctcgt gtcactgcgg acggcttcac caaccatgca 180

gcttctgtga agggccgctt caccatctcc aaggacaacg cgaagaacac gctgtacttg 240

cagatggatt ctatgaaaag cgaagacact gccgtgtact actgtgccgc tgggcggacc 300

tggaactccg gttttgagta ttggggccag ggcacccagg tcaccgtgtc gtcc 354

<210> 60
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-466 (nucleic acid)

<400> 60
caggtccact tggtggagag cggtggaggc tccgtgcagg ccggaggttc tctccgtctc 60

tcatgccagg cctccgcgga catccgcctg ttttacctga tgggctggtt ccgccaagca 120

cccgggaagg agcgcgagga ggtggctcgg gttaacgcgg atgacagcat taactacgtg 180

gcgagtgtaa agggccgctt caccatctcc aaggacaacg ccaagaacac gctgtacttg 240

cagatggatt ctcttaaacc ggaagacacc gccacttact actgtgctgc tgggcgaacc 300

tggaactccg gcttcgagta ttggggccag ggcacccagg tcaccgtgag ctcg 354

<210> 61
<211> 342
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-496 (nucleic acid)

<400> 61
cagatccagc tggtggagag tggaggcggc ttggtgcagc cagggggctc cctacgcctg 60

tcatgcgctg cttctggctt cacgttcagc aactacccga tgacctggct ccgccaggcc 120

cccgggaaag gcctcgagag cgtgtccgac atcacctccg gtggtgatcg gccctattac 180

gcggactcgg tgaagggcag gtttacaatt tctcgcgaca acgccaagaa tatgctgtac 240

ctggagatga actccctgaa gactgaagac accgccgtgt actactgtgc cacctgggat 300

cgcaccctga cgggacaagg cacccaggtc accgttagct cg 342

<210> 62
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-653 (nucleic acid)

<400> 62
caggtgaagc tggtggagag cggtgggggc tccgtgcagg ccggaggtag ccttcgcctg 60

tcatgccagg cctccgccta cattcgggtg ttttacctga tgggctggtt ccgccaggcc 120

ccggggaagg agcgcgagga ggtggcacga gtcaacgcgg acggcatcac caaccatgca 180

gcttccgtaa aaggccgctt caccatctcc aaggacaacg ccaagaacac gctatacctc 240

cagatggatt ctctgaagcc cgaggacacc gccgtgtact actgtgctgc gggacgtact 300

tggaactccg gcttcgaata ttggggccag ggcacccagg tcactgtcag ttcc 354

<210> 63
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-253 (nucleic acid)

<400> 63
gaggtgcagc tggtggagag cggcggcggt ttggtgcagc caggaggctc cctccgcctg 60

tcatgcgccg cttccggccg caccttcagc agctacaaca tgggctggtt ccgccaggcc 120

cccggcaaag gcctggagtg ggtcgcggcc gtggattggt ctggcggttc cccctattac 180

gcggactccg tgaagggccg cttcaccatc tcccgcgaca actccaagaa cacggtgtac 240

ctgcagatga actctctgcg cgccgaggac accgccgtct actactgtgc cggccgagtg 300

cagtacggct ccagttggtc tggggactat tggggccagg gcaccctggt gaccgtgtcg 360

tcc 363

<210> 64
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-256 (nucleic acid)

<400> 64
gaggtgcagc tggtggagag cggaggcggt ttggtgcagc caggggttc tctgcgcctg 60

agctgtgctg cttccggtcg tacgttcagc agctacaaca tgggctggtt ccgccaggcc 120

cccggcaaag gcctggagtt cgtcgccgtg gtggactggt ctggcggctc cccctattac 180

gcggactccg tgaagggccg cttcaccatc tcccgcgaca actccaagaa cacggtgtac 240

ctgcagatgt cttctcttcg cgccgaggac accgccgtct actactgcgc cggccgagtg 300

cagtacggct ccagttggtc tggtgattat tggggccagg gcaccctggt gaccgtgtcg 360

tcc 363

<210> 65
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-260 (nucleic acid)

<400> 65
gacgtgcagc tgctggagag cggaggcggg ctggtgcagc caggggttc tcttcgcctg 60

tcatgcgccg cttccggtcg caccatctct agctactcca tgggctggtt ccgccaggcc 120

cccggcaaag gcctcgagtt cgtcgcggcc atcagttggt ctggcggctc cccctattac 180

gcggactccg tgaagggccg cttcaccatc tcccgcgaca acgccaagaa cacggtctac 240

ctgcagatga actccctgcg cgccgaggac accgccgtgt actactgtgc tgctcctatt 300

gagtacggct ccagttggtc tgcggactat tggggccagg gcaccctggt caccgtgtcg 360

tcc 363

<210> 66
<211> 342
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-746 (nucleic acid)

<400> 66
cagatccagc tgctggagag tggcggcggg ctggtgcagc cgggaggctc cctgcgcctg 60

tcatgcgccg cttccggctt cacgttcagc aactacccaa tgacctggat ccgccaggcc 120

cccggcaaag gcctcgagag cgtgtccgac atcacctccg gtggtgatag gccctattac 180

gcggactccg tgaagggccg cttcaccatc tctcgcgaca acgccaagaa catgctgtac 240

ctgcagatga actccctccg cgccgaggac accgccgtgt actactgtgc cacctgggac 300

cgcacccttt ggggccaggg caccatggtg accgtgagct cc 342

<210> 67
<211> 342
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-750 (nucleic acid)

<400> 67
cagatccagc tggtggagag cggaggcggt ttggtgcagc cgggcggctc cctgcgcctg 60

agctgtgctg cttccggctt cacattttca aattatccaa tgacctggct ccgccaggcc 120

cccggcaagg gcctggagtc cgtgtccgac atcacctccg gtggggacag gccctattac 180

gcggacagcg tcaaaggccg cttcaccatc tctcgcgaca acgccaagaa catgctgtac 240

ctgcagatga actccttacg cgccgaggac accgccgtgt actactgcgc cacctgggac 300

cgcaccctga ccggccaggg caccatggtg accgtgagct cc 342

<210> 68
<211> 342

<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-753 (nucleic acid)

<400> 68
cagatccagc tggtggagag cggcggcggt ttggtgcagc cgggaggctc cctgcgcctg 60

tcatgcgccg cttccggctt caccttttca aattacccaa tgacctggct ccgccaggcc 120

cccggcaaag gcctggagtc cgtgtccgac atcacctccg gtggggacag gccctattac 180

gcggacagcg tgaagggccg cttcaccatc tctcgcgaca acgccaagaa catgctttac 240

ctgcagatga actccttacg cgccgaggac accgccgtgt actactgtgc cacctgggac 300

cgcaccctca ctggacaggg caccctggtc accgtgtcgt cc 342

<210> 69
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-836 (nucleic acid)

<400> 69
gaggtgcagc tggtggagag cggtggcggt ctggtgcagc cgggaggctc cttgcgtcta 60

tcatgcgccg cttccgcgga catccgcctg ttttacctga tgggctggtt ccgccaggcc 120

cccgggaaag ggttggtttg ggtcgcccga gtcaacgcgg atgacagcat ttcttacgcg 180

gatagtgtga agggccgctt caccatctcc cgcgacaacg ccaagaacac gctctacctc 240

cagatgaact ccctgcgcgc cgaggacacc gccgtatact actgtgctgc aggacggacc 300

tggaactccg gcttcgagta ctggggccag ggcactcttg tcaccgtgag ctcg 354

<210> 70
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-840 (nucleic acid)

<400> 70
caggtgcagc tgcaggagag cggaggaggt gtggtgcagc caggcggctc cttgcgcctg 60

tcatgcgccg ctagtgcgga catccgactc ttttacctga tgggctggtt ccgccaggcc 120

ccggggaaag gtctcgagtg ggtcgccttc gtgaacgcag atgacagcat ttactacgcg 180

gattccgtaa agggccgctt caccatctct cgggacaact ccaagaacac gctgtacctc 240

cagatgaaca gcctacgtgc cgaggacact gccgtgtact actgtgccgc tgggcgcacc 300

tggaactccg gcttcgagta ctggggccaa ggcaccctgg tgaccgtgtc gtct 354

<210> 71
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-843 (nucleic acid)

<400> 71
caggtccact tggtggagag cggaggtggt ctggtgcagc cagggggctc cctacgcctg 60

tcatgccagg cctccgcgga catccgactc ttttacctaa tgggctggtt ccgccaggcc 120

cccgggaaag gccttgtttg ggtcgcacgg gtcaacgcgg atgacagcat taactacgtg 180

gattctgtga agggccgctt caccatctcc aaggacaacg ccaagaacac gctgtacctg 240

cagatgaact ccctgcgcgc cgaggacacc gccgtgtact actgtgctgc tggacgtacc 300

tggaactccg gcttcgagta ttggggccag ggcaccctgg taacagtgtc gtcg 354

<210> 72
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-846 (nucleic acid)

<400> 72
caggtccact tgcaggagag cggcgggggt gtggtgcagc cgggaggctc ccttcgtctc 60

tcatgccaag cctcggcgga catccggctt ttttacctga tgggctggtt ccgccaggcc 120

cccgggaagg gactggagtg ggttgccttc gtgaacgctg atgacagcat taactacgcg 180

gattccgtga agggccgctt caccatctct aaggacaaca gcaaaaacac tctgtacctc 240

cagatgaact ccctgcgcgc tgaagacacc gccgtgtact actgtgctgc aggtcgcacc 300

tggaactccg gcttcgagta ttggggccag ggcaccctgg tgacggtgtc cagt 354

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

<220>
<223> CDR1 of VHH-083, huVHH-773, huVHH-776, VHH-131 (Kabat)

<400> 73

Gly Asn Ile Asn Ser Arg Asn Cys Met Gly
1 5 10

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

<220>
<223> CDR2 of VHH-083, huVHH-773, huVHH-776 (Kabat)

<400> 74

Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys
1 5 10 15

Gly

<210> 75
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 of VHH-083, huVHH-773, huVHH-776, VHH-131 (Kabat)

<400> 75

Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn
1 5 10 15

<210> 76
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 of VHH-083, huVHH-773, huVHH-776, VHH-131 (IMGT)

<400> 76

Gly Asn Ile Asn Ser Arg Asn Cys
1 5

<210> 77
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 of VHH-083, huVHH-773, huVHH-776, VHH-131 (IMGT)

<400> 77

Ile Gly Gln Val Thr Gly Arg Ser
1 5

<210> 78
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 of VHH-083, huVHH-773, huVHH-776, VHH-131 (IMGT)

<400> 78

Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr
1 5 10 15

Arg Asn

<210> 79
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 of VHH-111 (Kabat)

<400> 79

Gly Asp Thr Leu Ser Asn Lys Trp Met Gly
1 5 10

<210> 80
<211> 16

<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 of VHH-111 (Kabat)

<400> 80

Thr Ile Arg Thr Asp His Ala Gly Thr Tyr Ala Asp Ser Val Lys Gly
1   5   10   15

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

<220>
<223> CDR3 of VHH-111 (Kabat)

<400> 81

Ser Tyr Ser Gly Ala Thr Thr Phe Arg Tyr
1   5   10

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

<220>
<223> CDR1 of VHH-111 (IMGT)

<400> 82

Gly Asp Thr Leu Ser Asn Lys Trp
1   5

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

<220>
<223> CDR2 of VHH-111 (IMGT)

<400> 83

Ile Arg Thr Asp His Ala Gly Thr
1   5

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

<220>
<223> CDR3 of VHH-111 (IMGT)

<400> 84

Ala Ala Ser Tyr Ser Gly Ala Thr Thr Phe Arg Tyr
1   5   10

<210> 85
<211> 125
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-083 (amino acid)

<400> 85

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1   5   10   15

Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn
            20   25   30

Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val
        35   40   45

Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val
    50   55   60

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

Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys
                85   90   95

Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr
            100   105   110

Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        115   120   125

<210> 86
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-111 (amino acid)

<400> 86

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asp Thr Leu Ser Asn Lys
20 25 30

Trp Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Asp Trp Val
35 40 45

Ala Thr Ile Arg Thr Asp His Ala Gly Thr Tyr Ala Asp Ser Val Lys
50 55 60

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

Gln Met Asn Asn Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala
85 90 95

Ala Ser Tyr Ser Gly Ala Thr Thr Phe Arg Tyr Trp Gly Gln Gly Thr
100 105 110

Gln Val Thr Val Ser Ser
115

<210> 87
<211> 125
<212> PRT
<213> Artificial Sequence

<220>
<223> huVHH-773 (amino acid)

<400> 87

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Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5                   10                  15


Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile Asn Ser Arg Asn
            20                  25                  30


Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly Arg Glu Gly Val
        35                  40                  45


Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val
    50                  55                  60


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


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


Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr
            100                 105                 110


Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
        115                 120                 125


<210>  88
<211>  125
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  huVHH-776 (amino acid)

<400>  88

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1               5                   10                  15


Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile Asn Ser Arg Asn
            20                  25                  30


Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly Arg Glu Gly Val
        35                  40                  45
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Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val
50 55 60

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

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

Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr
100 105 110

Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120 125

<210> 89
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-083 (nucleic acid)

<400> 89
caggtgcagc tggtggagag cggaggtggc tctgtgcagg ctggtgggtc gctcaggctg 60

tcatgcgggg cgtccggcaa cattaactcc cgcaactgca tgggctggtt ccgtcaagcc 120

ccaggcaagg agcgcgaggg cgtagccgct atcggtcagg tcaccggccg cagctactac 180

gtggattctg ttaaaggccg cttcaccatc tcgttggaca acgcgaagaa cacgctgtac 240

ctgcagatga acacactgaa gcccgaagac accgccatgt attactgtgc tgcagccccg 300

gggtgtctgc tgtccgctct gcgctccgcg gactaccgga attggggcca gggcacccag 360

gtcaccgtgt ccagt 375

<210> 90
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-111 (nucleic acid)

<400> 90
gaggtgcagc tggtggagag cggaggggga tccgtgcaag ccggcggctc cttgcgcctg 60

tcatgcgccg cttccggtga tactcttagc aacaaatgga tgggctggtt ccgccaggcc 120

cccggcaagg agcgcgattg ggtcgcgacg attcgtaccg accacgccgg gacctacgcg 180

gacagtgtga agggccgctt caccatctcg cgggacaact ttaagaatat gatctacctg 240

cagatgaaca acctgaagcc tgaagacacc gccatgtatt actgtgctgc tagctactcc 300

ggtgcaacca ccttcagata ctggggccag ggcacccagg tcaccgtttc ttct 354

<210> 91
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-773 (nucleic acid)

<400> 91
caggtgcagc tggtggagag cggaggcggg ctggtgcagc cgggcggctc cctccgcctg 60

tcatgcgccg cttccggcaa cattaattcc cgcaactgca tgggctggtt ccgccaggcc 120

cccggcaagg gcagggaggg cgtggcggcc atcggtcagg tcaccggccg cagctattac 180

gtggattctg tgaagggacg cttcaccatc tctctggaca actccaagaa cacgctgtac 240

ctgcagatga acagcctgcg cgccgaggac accgccgtgt actactgtgc cgcggcgcca 300

gggtgcctgc tgtccgccct gcgctcggcg gactacagga actggggcca gggcaccctg 360

gttaccgtgt cctcc 375

<210> 92
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-776 (nucleic acid)

<400> 92
caggtgcagc tggtggagag cggaggcggt gtggtgcagc cagggcgatc tcttcgcctg 60

tcatgcgccg cttccggcaa cattaattcc cgcaactgca tgggctggtt ccgccaggcc 120

cccggcaaag gcagggaggg cgtggcggcc atcggtcagg tcaccggccg cagctattac 180

gtggattctg tgaagggccg cttcaccatc tctctggaca actccaagaa cacgctgtac 240

ctgcagatga acagcctgcg cgccgaggac accgccgtgt actactgtgc tgcggctccc 300

gggtgcctgc tgtccgccct gcgctcggcg gactaccgga actggggcca gggcaccctg 360

gtgaccgtgt cctcc 375

<210> 93
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-18 CDR1 (Kabat)

<400> 93

Gly Gly Ser Phe Arg Ser Val Ser Met Gly
1 5 10

<210> 94
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-18 CDR2 (Kabat)

<400> 94

Leu Leu Thr Ala Gly Met Arg Ser Asp Val Tyr Ala Asp Pro Val Lys
1 5 10 15

Gly

<210> 95
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-18 CDR3 (Kabat)

<400> 95

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

<210> 96
<211> 8

<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-18 CDR1 (IMGT)

<400> 96

Gly Gly Ser Phe Arg Ser Val Ser
1 5

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

<220>
<223> VHH-18 CDR2 (IMGT)

<400> 97

Leu Thr Ala Gly Met Arg Ser Asp
1 5

<210> 98
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-18 CDR3 (IMGT)

<400> 98

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

Glu Tyr

<210> 99
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 and huVHH-077 CDR1 (Kabat)

<400> 99

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn
1 5 10

<210> 100
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 and huVHH-077 CDR2 (Kabat)

<400> 100

Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser
1 5 10 15

<210> 101
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 and huVHH-077 CDR3 (Kabat)

<400> 101

Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn
1 5 10

<210> 102
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 and huVHH-077 CDR1 (IMGT)

<400> 102

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr
1 5 10

<210> 103
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 and huVHH-077 CDR2 (IMGT)

<400> 103

Ile Ala Ala Ser Gly Ser Thr
1 5

<210> 104
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 and huVHH-077 CDR3 (IMGT)

<400> 104

Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn
1 5 10

<210> 105
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-87 CDR1 (Kabat)

<400> 105

Val Tyr Thr Trp Gly Thr Tyr Cys Met Gly
1 5 10

<210> 106
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-87 CDR2 (Kabat)

<400> 106

Thr Ile Asp Pro Ala Gly Thr Thr Thr Tyr Ala Asn Ser Val Lys Gly
1 5 10 15

<210> 107
<211> 17
<212> PRT
<213> Artificial Sequence

<220>

<223> VHH-87 CDR3 (Kabat)

<400> 107

Arg Ala Tyr Asp Ala Pro Trp Ala Cys Trp Thr Gly Ala Val Phe Arg
1   5   10   15

Asp

<210> 108
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-87 CDR1 (IMGT)

<400> 108

Val Tyr Thr Trp Gly Thr Tyr Cys
1   5

<210> 109
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-87 CDR2 (IMGT)

<400> 109

Ile Asp Pro Ala Gly Thr Thr
1   5

<210> 110
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-87 CDR3 (IMGT)

<400> 110

Ala Ala Arg Ala Tyr Asp Ala Pro Trp Ala Cys Trp Thr Gly Ala Val
1   5   10   15

Phe Arg Asp

<210> 111
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-90 CDR1 (Kabat)

<400> 111

Gly Ser Met Tyr Ser Arg Tyr Cys Met Gly
1 5 10

<210> 112
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-90 CDR2 (Kabat)

<400> 112

Thr Ile Asp Pro Ala Gly Thr Thr Thr Tyr Ala Asn Ser Val Lys Gly
1 5 10 15

<210> 113
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-90 CDR3 (Kabat)

<400> 113

Arg Ala Tyr Asp Ala Pro Trp Ser Cys Trp Thr Gly Ala Val Phe Gly
1 5 10 15

Asp

<210> 114
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-90 CDR1 (IMGT)

<400> 114

Gly Ser Met Tyr Ser Arg Tyr Cys
1   5

<210> 115
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-90 CDR2 (IMGT)

<400> 115

Ile Asp Pro Ala Gly Thr Thr
1   5

<210> 116
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-90 CDR3 (IMGT)

<400> 116

Ala Ala Arg Ala Tyr Asp Ala Pro Trp Ser Cys Trp Thr Gly Ala Val
1   5   10   15

Phe Gly Asp

<210> 117
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 CDR1 (Kabat)

<400> 117

Gly Tyr Thr Tyr Arg Gly Tyr Cys Leu Ala
1   5   10

<210> 118
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 CDR2 (Kabat)

<400> 118

Thr Ile Asp Ser Asp Gly Tyr Ile Ser Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> 119
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 CDR3 (Kabat)

<400> 119

Arg Gly Gly Trp Cys Tyr Ser Leu Ser Lys Glu Tyr Asn Tyr
1 5 10

<210> 120
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 CDR1 (IMGT)

<400> 120

Gly Tyr Thr Tyr Arg Gly Tyr Cys
1 5

<210> 121
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 CDR2 (IMGT)

<400> 121

Ile Asp Ser Asp Gly Tyr Ile
1 5

<210> 122
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 CDR3 (IMGT)

<400> 122

Ala Ala Arg Gly Gly Trp Cys Tyr Ser Leu Ser Lys Glu Tyr Asn Tyr
1 5 10 15

<210> 123
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 CDR1 (Kabat)

<400> 123

Leu Ser Leu Asn Arg Val Ser Ile Ala
1 5

<210> 124
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 CDR2 (Kabat)

<400> 124

Thr Gln Ser Phe Thr Gly Asp Thr Ala Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> 125
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 CDR3 (Kabat)

<400> 125

Gly Arg Thr Tyr Ser Ser Arg Asp Pro Leu Ala Asp Glu Tyr Asn Tyr
1 5 10 15

<210> 126
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 CDR1 (IMGT)

<400> 126

Leu Ser Leu Asn Arg Val Ser
1 5

<210> 127
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 CDR2 (IMGT)

<400> 127

Gln Ser Phe Thr Gly Asp Thr
1 5

<210> 128
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 CDR3 (IMGT)

<400> 128

Ala Ala Gly Arg Thr Tyr Ser Ser Arg Asp Pro Leu Ala Asp Glu Tyr
1 5 10 15

Asn Tyr

<210> 129
<211> 125

<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-18 (amino acid)

<400> 129

Gln Val Lys Leu Val Glu Ser Gly Gly Gly Ser Val Glu Ile Gly Gly
1   5   10   15

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

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

Ala Leu Leu Thr Ala Gly Met Arg Ser Asp Val Tyr Ala Asp Pro Val
    50   55   60

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

Leu Asp Met Asn Ala Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys
                85   90   95

Ala Ala Gly Arg Arg Phe Arg Ser Asp His Trp Tyr Leu Asp Asp Tyr
            100   105   110

Glu Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        115   120   125

<210> 130
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 (amino acid)

<400> 130

Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1   5   10   15

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Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly
            20                  25                  30


Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu
        35                  40                  45


Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser
    50                  55                  60


Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe
65                  70                  75                  80


Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp Thr Ala Val Tyr Tyr
                85                  90                  95


Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg
            100                 105                 110


Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        115                 120


<210>  131
<211>  125
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  VHH-87 (amino acid)

<400>  131

Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ser Gly Gly
1               5                   10                  15


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


Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val
        35                  40                  45


Ala Thr Ile Asp Pro Ala Gly Thr Thr Thr Tyr Ala Asn Ser Val Lys
    50                  55                  60
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Gly Arg Phe Thr Ile Ser Asp Asp Asn Ala Gln Asn Thr Leu Tyr Leu
65                  70                  75                  80


Gln Met Asn Ser Leu Arg Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala
                85                  90                  95


Ala Arg Ala Tyr Asp Ala Pro Trp Ala Cys Trp Thr Gly Ala Val Phe
            100                 105                 110


Arg Asp Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        115                 120                 125


<210>  132
<211>  125
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  VHH-90 (amino acid)

<400>  132

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ser Gly Gly
1               5                   10                  15


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


Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val
        35                  40                  45


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


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


Gln Met Asn Ser Leu Arg Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala
                85                  90                  95


Ala Arg Ala Tyr Asp Ala Pro Trp Ser Cys Trp Thr Gly Ala Val Phe
            100                 105                 110
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Gly Asp Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        115   120   125

<210> 133
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 (amino acid)

<400> 133

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ser Gly Gly
1   5   10   15

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

Cys Leu Ala Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Arg Val
        35   40   45

Ala Thr Ile Asp Ser Asp Gly Tyr Ile Ser Tyr Ala Asp Ser Val Lys
    50   55   60

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

Glu Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala
                85   90   95

Ala Arg Gly Gly Trp Cys Tyr Ser Leu Ser Lys Glu Tyr Asn Tyr Trp
            100   105   110

Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        115   120

<210> 134
<211> 123
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 (amino acid)

<400> 134

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Glu Ser Leu Ser Leu Asn Arg Val Ser
20 25 30

Ile Ala Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala
35 40 45

Thr Gln Ser Phe Thr Gly Asp Thr Ala Tyr Ala Asp Ser Val Lys Gly
50 55 60

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

Met Asn Ser Leu Lys Leu Glu Asp Ser Ala Lys Tyr Tyr Cys Ala Ala
85 90 95

Gly Arg Thr Tyr Ser Ser Arg Asp Pro Leu Ala Asp Glu Tyr Asn Tyr
100 105 110

Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 135
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> huVHH-077 (amino acid)

<400> 135

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly
20 25 30

Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu
35 40 45

Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser
    50   55   60

Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Lys Asn Gln Phe
65   70   75   80

Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr
                85   90   95

Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg
            100   105   110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser
        115   120

<210> 136
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-18 (nucleic acid)

<400> 136
caggttaagc tggtggagag cggaggcggc tccgtggaga tcggtggctc cctacgcctg   60

gcctgcaagt actccggtgg ttccttccgc tcggtatcta tgggctggct ccgccaggcc   120

gtggggaagg agcgcgaggg cgtcgctctg cttactgctg gaatgcgtag cgacgtgtac   180

gcggacccgg tgaagggccg cttcaccatc tcacaggata ttgacaaaaa cacgatgtac   240

ctggacatga acgcgctgaa gcccgaagac accgccatgt attactgtgc cgcagggcga   300

aggtttcgga gtgaccactg gtacttggat gactacgagt attggggcca gggcacccag   360

gtcaccgtga gctct   375

<210> 137
<211> 366
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-66 (nucleic acid)

<400> 137
gaggtgcagc tggtggagag tgggcccggg ttggtgaagc cctctcagac tctgtctctg 60

acctgcaccg tgtccggtgc ttccatcacc accggcgagt tctattggaa ttggttccgc 120

cagccgcctg gcaagggcct ggagtggatg ggcgccatcg cggcttctgg ctccacgacc 180

tactccccat ccttcgagag ccgcaccagc atctctcgcg acacctccga gaaccagttc 240

tacctgcagc tgagctccgt gactccggaa gataccgccg tgtactactg cgggcgcagc 300

ttcggcgtgg cggccgtcac cacaggccag aaccgcggac agggcaccca ggtcaccgtg 360

tcgtcc 366

<210> 138
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-87 (nucleic acid)

<400> 138
caaatccagc tggtggagag tggtggtgga tcggtgcaga gcggaggctc cctccgcctg 60

tcatgcaagg cctccgtgta cacctggggc acctactgta tgggctggtt ccgccaggcc 120

cccgggaagg agcgcgaggg cgtcgcaact attgacccag ctgggaccac aacttacgcc 180

aactccgtta agggccgctt caccatcagc gatgacaacg cgcagaacac gctgtacctg 240

cagatgaact ccttgaggcc tgaagacacc gccatgtatt actgtgctgc gcgggcctac 300

gacgctccgt gggcgtgctg gacgggtgcc gtgtttcgtg attggggcca gggcacccag 360

gtcaccgtgt cctct 375

<210> 139
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-90 (nucleic acid)

<400> 139
caagtgcagc tggtggagag cggaggcggc tccgtgcaga gcggtggcag tctcaagctg 60

agctgcgccg cttccggttc tatgtactcc cgctactgca tgggctggtt ccgccaggcc 120

cccgggaagg agagggaggg cgtcgcaact attgaccctg ctggaacaac cacctacgcg 180

aactccgtta aaggccgctt caccatctct ggggacaacg cgcagaacac gatgtacctg 240

cagatgaact ccttgcggcc cgaagacacc gccatgtatt actgtgctgc tcgtgcctac 300

gacgccccgt ggtcttgttg gactggggcg gtgtttggtg attggggcca gggcacccag 360

gtcaccgtgt cgtcg 375

<210> 140
<211> 366
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-102 (nucleic acid)

<400> 140
gaggtgcagc tggtggagag cggaggtggg tctgtgcaaa gcggcggctc cctccgcctg 60

tcatgcgccg cttccggata cacctacagg ggctactgcc tggcgtggtt ccgccaggcc 120

cccgggaaag agcgcgagcg ggtcgccact attgacagcg atggctacat ctcgtacgcg 180

gactccgtga agggccgctt taccatctct caggacaaca ctaagaacac gttgtacctg 240

gagatgaata cactgaagcc tgaagacacc gccatgtatt actgtgctgc acgtggtggt 300

tggtgttact ccctttccaa ggagtacaac tattggggcc agggcaccca ggtcaccgtt 360

tcgagt 366

<210> 141
<211> 369
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-105 (nucleic acid)

<400> 141
caagtgcagc tggtggagag cggaggcggc tccgtgcagg ccggtggttc tcttcgattg 60

tcatgcgccg aaagtctatc tctcaaccgc gtcagcattg catggttccg ccaggctcct 120

ggcaaggaga gggagggcgt agctacccag agctttacag gggacaccgc gtacgcggat 180

tctgttaaag ggcgcttcac catctcccgc gacaacacta agaacacggt gtacctgtcc 240

atgaactccc tgaagctgga ggacagcgcc aagtactact gtgccgctgg acgtacttac 300

tcctcccggg atcccctggc ggacgagtac aactattggg gccagggcac ccaggtcacc 360

gtgtcgtcg 369

<210> 142
<211> 366
<212> DNA
<213> Artificial Sequence

<220>
<223> huVHH-077 (nucleic acid)

<400> 142
caggtgcagc tgcaggagag tgggcccggg ttggtgaagc cctctcagac tctttctctg 60

acctgcaccg tgtccggtgc ttccatcacc accggcgagt tctattggaa ttggttccgc 120

cagccgcccg gcaagggcct ggagtggatg ggcgccatcg cggcttctgg ctccacgacc 180

tactccccat ccttcgagag ccgcaccagc atctcccgcg acacctccaa gaaccagttt 240

tcactgaagc tgagctccgt gacggccgcg gacaccgccg tgtactactg cgggcgctcc 300

ttcggcgtgg cggccgtcac cacaggccag aaccgcggac agggcaccct ggtgaccgtg 360

agctcg 366

<210> 143
<211> 2
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 1

<220>
<221> MISC_FEATURE
<222> (1)..(2)
<223> can be repeated n times, where n is an integer including, e.g., 1, 2, 3, 4, 5, and 6

<400> 143

Gly Ser
1

<210> 144
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 2

<220>
<221> MISC_FEATURE
<222> (1)..(5)
<223> can be repeated n times, where n is an integer including, e.g.,
       1, 2, 3, 4, 5, and 6

<400> 144

Gly Ser Gly Gly Ser
1   5

<210> 145
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 3

<220>
<221> MISC_FEATURE
<222> (1)..(4)
<223> can be repeated n times, where n is an integer including, e.g.,
       1, 2, 3, 4, 5, and 6

<400> 145

Gly Gly Gly Ser
1

<210> 146
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 4

<400> 146

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Gly
1   5   10   15

Ser Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
            20   25   30

Gly Ser

<210> 147
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 5

<220>
<221> MISC_FEATURE
<222> (1)..(5)
<223> can be repeated n times, where n is an integer including, e.g.,
       1, 2, 3, 4, 5, and 6

<400> 147

Gly Gly Gly Gly Ser
1   5

<210> 148
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 6

<400> 148

Asp Gly Gly Gly Ser
1   5

<210> 149
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 7

<400> 149

Thr Gly Glu Lys Pro
1   5

<210> 150
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 8

<400> 150

Gly Gly Arg Arg
1

<210> 151
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 9

<400> 151

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Gly
1   5   10   15

Ser Gly Ser Gly Gly Gly Gly Ser
            20

<210> 152
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 10

<400> 152

Glu Gly Lys Ser Ser Gly Ser Gly Ser Glu Ser Lys Val Asp
1   5   10

<210> 153
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 11

<400> 153

Lys Glu Ser Gly Ser Val Ser Ser Glu Gln Leu Ala Gln Phe Arg Ser
1 5 10 15

<210> 154
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 12

<400> 154

Gly Gly Arg Arg Gly Gly Gly Ser
1 5

<210> 155
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 13

<400> 155

Leu Arg Gln Arg Asp Gly Glu Arg Pro
1 5

<210> 156
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 14

<400> 156

Leu Arg Gln Lys Asp Gly Gly Gly Ser Glu Arg Pro
1 5 10

<210> 157
<211> 16
<212> PRT
<213> Artificial Sequence

<220>

<223> Exemplary peptide linker 15

<400> 157

Leu Arg Gln Lys Asp Gly Gly Gly Ser Gly Gly Gly Ser Glu Arg Pro
1   5   10   15

<210> 158
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 16

<400> 158

Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly Ser Thr
1   5   10   15

<210> 159
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 17

<400> 159

Gly Ser Thr Ser Gly Ser Gly Lys Ser Ser Glu Gly Lys Gly
1   5   10

<210> 160
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary peptide linker 18

<400> 160

Lys Glu Ser Gly Ser Val Ser Ser Glu Gln Leu Ala Gln Phe Arg Ser
1   5   10   15

Leu Asp

<210> 161
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Signal Peptide (CD8Alpha)

<400> 161

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
            20

<210> 162
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> Hinge (CD8Alpha)

<400> 162

Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala
1   5   10   15

Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly
            20   25   30

Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp
        35   40   45

<210> 163
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Transmembrane domain (CD8Alpha)

<400> 163

Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu
1   5   10   15

Ser Leu Val Ile Thr Leu Tyr Cys
            20

<210> 164
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Co-stimulatory signaling domain (CD137)

<400> 164

Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met
1   5   10   15

Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe
            20   25   30

Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
        35   40

<210> 165
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> Primary intracellular signaling domain (CD3Zeta)

<400> 165

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
1   5   10   15

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
            20   25   30

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
        35   40   45

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
    50   55   60

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
65   70   75   80

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
85 90 95

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
100 105 110

<210> 166
<211> 9
<212> DNA
<213> Artificial Sequence

<220>
<223> Kozak sequence

<400> 166
gccgccacc 9

<210> 167
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> EcoRI restriction site

<400> 167
gaattc 6

<210> 168
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> SpeI restriction site

<400> 168
actagt 6

<210> 169
<211> 227
<212> PRT
<213> Artificial Sequence

<220>
<223> human IgG1 Fc fragment sequence

<400> 169

```
Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly
1               5                  10                  15

Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
            20                  25                  30

Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
        35                  40                  45

Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
    50                  55                  60

His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr
65                  70                  75                  80

Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
                85                  90                  95

Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile
            100                 105                 110

Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val
        115                 120                 125

Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser
    130                 135                 140

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

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

Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
            180                 185                 190

Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met
        195                 200                 205
```

```
His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser
    210                 215                 220


Pro Gly Lys
225
```

<210> 170
<211> 224
<212> PRT
<213> Artificial Sequence

<220>
<223> Rituximab VH-CH1

<400> 170

```
Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala
1               5                   10                  15


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


Asn Met His Trp Val Lys Gln Thr Pro Gly Arg Gly Leu Glu Trp Ile
        35                  40                  45


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


Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
65                  70                  75                  80


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


Ala Arg Ser Thr Tyr Tyr Gly Gly Asp Trp Tyr Phe Asn Val Trp Gly
            100                 105                 110


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


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

```
Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val
145                 150                 155                 160


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


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


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


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

<210> 171
<211> 213
<212> PRT
<213> Artificial Sequence

<220>
<223> Rituximab VL-CL

<400> 171

```
Gln Ile Val Leu Ser Gln Ser Pro Ala Ile Leu Ser Ala Ser Pro Gly
1               5                   10                  15


Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Val Ser Tyr Ile
            20                  25                  30


His Trp Phe Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr
        35                  40                  45


Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Val Arg Phe Ser Gly Ser
    50                  55                  60


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


Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Thr Ser Asn Pro Pro Thr
                85                  90                  95
```

```
Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala Ala Pro
            100                 105                 110


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


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


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


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


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


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


Asn Arg Gly Glu Cys
    210


<210>  172
<211>  225
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Leu16 VH-CH1

<400>  172

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


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


Asn Met His Trp Val Lys Gln Thr Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45
```

```
Gly Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln Lys Phe
    50                  55                  60

Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
65                  70                  75                  80

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

Ala Arg Ser Asn Tyr Tyr Gly Ser Ser Tyr Trp Phe Phe Asp Val Trp
            100                 105                 110

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

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

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

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

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

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

His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser
    210                 215                 220

Cys
225
```

<210> 173
<211> 213
<212> PRT
<213> Artificial Sequence

<220>

<223> Leu16 VL-CL

<400> 173

```
Asp Ile Val Leu Thr Gln Ser Pro Ala Ile Leu Ser Ala Ser Pro Gly
1               5                  10                  15


Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Val Asn Tyr Met
            20                  25                  30


Asp Trp Tyr Gln Lys Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr
        35                  40                  45


Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser
    50                  55                  60


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


Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Ser Phe Asn Pro Pro Thr
                85                  90                  95


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


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


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


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


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


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


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

Asn Arg Gly Glu Cys
210

<210> 174
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-2C1 CAR (amino acid)

<400> 174

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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
20 25 30

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
50 55 60

Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65 70 75 80

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
85 90 95

Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
115 120 125

Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Glu Val Gln Leu
130 135 140

Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu
145 150 155 160

```
Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp
                165                 170                 175

Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala
            180                 185                 190

Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg
        195                 200                 205

Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu
    210                 215                 220

Ser Ser Val Thr Pro Glu Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser
225                 230                 235                 240

Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr
                245                 250                 255

Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val
            260                 265                 270

Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser
        275                 280                 285

Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe
    290                 295                 300

Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala Ala Ile Gly Gln
305                 310                 315                 320

Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr
                325                 330                 335

Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr
            340                 345                 350

Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly
        355                 360                 365
```

```
Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590
```

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
595 600 605

Leu His Met Gln Ala Leu Pro Pro Arg
610 615

<210> 175
<211> 627
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-2C2 CAR (amino acid)

<400> 175

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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
20 25 30

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
50 55 60

Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65 70 75 80

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
85 90 95

Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
115 120 125

Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
130 135 140

```
Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser
145                 150                 155                 160

Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr
                165                 170                 175

Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu
            180                 185                 190

Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro
        195                 200                 205

Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln
    210                 215                 220

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

Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn
                245                 250                 255

Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser
            260                 265                 270

Gly Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
        275                 280                 285

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
    290                 295                 300

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
305                 310                 315                 320

Glu Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr
                325                 330                 335

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
            340                 345                 350
```

```
Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
        355                 360                 365

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
    370                 375                 380

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
385                 390                 395                 400

Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
                405                 410                 415

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
            420                 425                 430

Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
        435                 440                 445

Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
    450                 455                 460

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
465                 470                 475                 480

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
                485                 490                 495

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
            500                 505                 510

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
        515                 520                 525

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
    530                 535                 540

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
545                 550                 555                 560

Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
                565                 570                 575
```

```
Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
            580                 585                 590


Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
        595                 600                 605


Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu
    610                 615                 620


Pro Pro Arg
625
```

<210> 176
<211> 637
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-2C3 CAR (amino acid)

<400> 176

```
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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
        35                  40                  45


Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
    50                  55                  60


Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65                  70                  75                  80


Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
                85                  90                  95


Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
            100                 105                 110
```

```
Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
        115                 120                 125

Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
    130                 135                 140

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly
145                 150                 155                 160

Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly
                165                 170                 175

Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro
            180                 185                 190

Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser
        195                 200                 205

Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp
    210                 215                 220

Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu
225                 230                 235                 240

Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val
                245                 250                 255

Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser
            260                 265                 270

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln
        275                 280                 285

Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser
    290                 295                 300

Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys
305                 310                 315                 320
```

```
Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala
                325                 330                 335

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

Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu
        355                 360                 365

Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala
    370                 375                 380

Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg
385                 390                 395                 400

Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr Thr
                405                 410                 415

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
            420                 425                 430

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
        435                 440                 445

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
    450                 455                 460

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
465                 470                 475                 480

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
                485                 490                 495

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
            500                 505                 510

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
        515                 520                 525

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
    530                 535                 540
```

```
Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
545                 550                 555                 560


Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
                565                 570                 575


Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
            580                 585                 590


Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
        595                 600                 605


Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
    610                 615                 620


Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
625                 630                 635


<210>  177
<211>  647
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  AIO-2C4 CAR (amino acid)

<400>  177

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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
        35                  40                  45


Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
    50                  55                  60


Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65                  70                  75                  80
```

```
Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
                85                  90                  95

Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
        115                 120                 125

Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
    130                 135                 140

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val
145                 150                 155                 160

Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr
                165                 170                 175

Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn
            180                 185                 190

Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile
        195                 200                 205

Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr
    210                 215                 220

Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser
225                 230                 235                 240

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

Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln
            260                 265                 270

Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
        275                 280                 285
```

```
Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser
    290                 295                 300

Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly
305                 310                 315                 320

Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln
                325                 330                 335

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

Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser
        355                 360                 365

Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys
    370                 375                 380

Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu
385                 390                 395                 400

Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr
                405                 410                 415

Gln Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro
            420                 425                 430

Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro
        435                 440                 445

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
    450                 455                 460

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
465                 470                 475                 480

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly
                485                 490                 495

Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val
            500                 505                 510
```

```
Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu
        515                 520                 525

Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp
    530                 535                 540

Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
545                 550                 555                 560

Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
                565                 570                 575

Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
            580                 585                 590

Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
        595                 600                 605

Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
    610                 615                 620

Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
625                 630                 635                 640

Met Gln Ala Leu Pro Pro Arg
                645
```

<210> 178
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-3C1 CAR (amino acid)

<400> 178

```
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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
            20                  25                  30
```

```
Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95

Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val
145                 150                 155                 160

Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala
225                 230                 235                 240
```

```
Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460
```

```
Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 179
<211> 627
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-3C2 CAR (amino acid)

<400> 179

```
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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
            20                  25                  30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95

Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser
145                 150                 155                 160

Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly
                165                 170                 175

Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln
            180                 185                 190

Ala Pro Gly Lys Glu Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr
        195                 200                 205

Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser
    210                 215                 220
```

```
Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys
225                 230                 235                 240


Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu
                245                 250                 255


Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr
            260                 265                 270


Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
        275                 280                 285


Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
    290                 295                 300


Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr
305                 310                 315                 320


Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly Leu Glu Ser Val
                325                 330                 335


Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val
            340                 345                 350


Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Met Leu Tyr
        355                 360                 365


Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr Ala Val Tyr Tyr Cys
    370                 375                 380


Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Gln Val Thr Val
385                 390                 395                 400


Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
                405                 410                 415


Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
            420                 425                 430


Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
        435                 440                 445
```

```
Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
    450                 455                 460

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
465                 470                 475                 480

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
                485                 490                 495

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
            500                 505                 510

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
        515                 520                 525

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
    530                 535                 540

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
545                 550                 555                 560

Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
                565                 570                 575

Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
            580                 585                 590

Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
        595                 600                 605

Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu
    610                 615                 620

Pro Pro Arg
625
```

<210> 180
<211> 637
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-3C3 CAR (amino acid)

<400> 180

```
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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95


Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110


Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125


Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140


Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val
145                 150                 155                 160


Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu
                165                 170                 175


Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met
            180                 185                 190
```

```
Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala Ala
        195                 200                 205

Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly
    210                 215                 220

Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln
225                 230                 235                 240

Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala
                245                 250                 255

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

Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser
        275                 280                 285

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu
    290                 295                 300

Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys
305                 310                 315                 320

Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg
                325                 330                 335

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

Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile
        355                 360                 365

Ser Arg Asp Asn Ala Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu
    370                 375                 380

Lys Thr Glu Asp Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr
385                 390                 395                 400

Leu Thr Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr Thr
                405                 410                 415
```

```
Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
            420                 425                 430

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
        435                 440                 445

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
    450                 455                 460

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
465                 470                 475                 480

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
                485                 490                 495

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
            500                 505                 510

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
        515                 520                 525

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
    530                 535                 540

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
545                 550                 555                 560

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
                565                 570                 575

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
            580                 585                 590

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
        595                 600                 605

Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
    610                 615                 620
```

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
625 630 635

<210> 181
<211> 647
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-3C4 CAR (amino acid)

<400> 181

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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
35 40 45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65 70 75 80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
85 90 95

Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
100 105 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
115 120 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
130 135 140

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
145 150 155 160

```
Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln
                165                 170                 175

Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn
            180                 185                 190

Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg
        195                 200                 205

Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val
    210                 215                 220

Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn
225                 230                 235                 240

Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met
                245                 250                 255

Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser
            260                 265                 270

Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        275                 280                 285

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
    290                 295                 300

Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val
305                 310                 315                 320

Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr
                325                 330                 335

Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly
            340                 345                 350

Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr
        355                 360                 365

Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys
    370                 375                 380
```

```
Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr Ala
385                 390                 395                 400

Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr
                405                 410                 415

Gln Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro
            420                 425                 430

Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro
        435                 440                 445

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
    450                 455                 460

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
465                 470                 475                 480

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly
                485                 490                 495

Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val
            500                 505                 510

Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu
        515                 520                 525

Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp
    530                 535                 540

Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
545                 550                 555                 560

Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
                565                 570                 575

Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
            580                 585                 590
```

```
Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
        595                 600                 605


Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
    610                 615                 620


Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
625                 630                 635                 640


Met Gln Ala Leu Pro Pro Arg
                645
```

<210> 182
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-4C1 CAR (amino acid)

<400> 182

```
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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95


Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110
```

```
Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val
145                 150                 155                 160

Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr
                165                 170                 175

Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr
        195                 200                 205

Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys
    210                 215                 220

Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr
                245                 250                 255

Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val
            260                 265                 270

Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser
        275                 280                 285

Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe
    290                 295                 300

Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala Ala Ile Gly Gln
305                 310                 315                 320

Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr
                325                 330                 335
```

```
Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr
            340                 345                 350

Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly
        355                 360                 365

Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540
```

```
Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560


Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575


Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590


Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605


Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 183
<211> 627
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-4C2 CAR (amino acid)

<400> 183

```
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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95
```

```
Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser
145                 150                 155                 160

Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala
                165                 170                 175

Ala Ser Gly Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln
            180                 185                 190

Ala Pro Gly Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly
        195                 200                 205

Asp Arg Pro Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser
    210                 215                 220

Arg Asp Asn Ala Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys
225                 230                 235                 240

Thr Glu Asp Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu
                245                 250                 255

Thr Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser
            260                 265                 270

Gly Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
        275                 280                 285

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
    290                 295                 300

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
305                 310                 315                 320
```

```
Glu Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr
                325                 330                 335

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
            340                 345                 350

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
        355                 360                 365

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
    370                 375                 380

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
385                 390                 395                 400

Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
                405                 410                 415

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
            420                 425                 430

Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
        435                 440                 445

Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
    450                 455                 460

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
465                 470                 475                 480

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
                485                 490                 495

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
            500                 505                 510

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
        515                 520                 525
```

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
530 535 540

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
545 550 555 560

Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
565 570 575

Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
580 585 590

Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
595 600 605

Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu
610 615 620

Pro Pro Arg
625

<210> 184
<211> 637
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-4C3 CAR (amino acid)

<400> 184

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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
35 40 45

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

```
Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95


Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110


Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125


Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140


Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Ile
145                 150                 155                 160


Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Leu
                165                 170                 175


Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr Pro Met
            180                 185                 190


Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly Leu Glu Ser Val Ser Asp
        195                 200                 205


Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val Lys Gly
    210                 215                 220


Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Met Leu Tyr Leu Glu
225                 230                 235                 240


Met Asn Ser Leu Lys Thr Glu Asp Thr Ala Val Tyr Tyr Cys Ala Thr
                245                 250                 255


Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Gln Val Thr Val Ser Ser
            260                 265                 270


Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln
        275                 280                 285
```

```
Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser
    290                 295                 300

Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys
305                 310                 315                 320

Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala
                325                 330                 335

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

Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu
        355                 360                 365

Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala
    370                 375                 380

Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg
385                 390                 395                 400

Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr Thr
                405                 410                 415

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
            420                 425                 430

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
        435                 440                 445

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
    450                 455                 460

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
465                 470                 475                 480

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
                485                 490                 495
```

```
Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
            500                 505                 510

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
        515                 520                 525

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
    530                 535                 540

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
545                 550                 555                 560

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
                565                 570                 575

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
            580                 585                 590

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
        595                 600                 605

Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
    610                 615                 620

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
625                 630                 635
```

<210> 185
<211> 647
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-4C4 CAR (amino acid)

<400> 185

```
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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
            20                  25                  30
```

```
Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95

Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
145                 150                 155                 160

Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln
                165                 170                 175

Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
            180                 185                 190

Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly Leu
        195                 200                 205

Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala
    210                 215                 220

Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn
225                 230                 235                 240

Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr Ala Val
                245                 250                 255
```

```
Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Gln
            260                 265                 270

Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
        275                 280                 285

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser
    290                 295                 300

Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly
305                 310                 315                 320

Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln
                325                 330                 335

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

Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser
        355                 360                 365

Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys
    370                 375                 380

Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu
385                 390                 395                 400

Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr
                405                 410                 415

Gln Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro
            420                 425                 430

Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro
        435                 440                 445

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
    450                 455                 460
```

```
Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
465                 470                 475                 480


Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly
                485                 490                 495


Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val
            500                 505                 510


Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu
        515                 520                 525


Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp
    530                 535                 540


Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
545                 550                 555                 560


Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
                565                 570                 575


Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
            580                 585                 590


Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
        595                 600                 605


Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
    610                 615                 620


Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
625                 630                 635                 640


Met Gln Ala Leu Pro Pro Arg
                645
```

<210> 186
<211> 617
<212> PRT
<213> Artificial Sequence

<220>

<223> AIO-5C1 CAR (amino acid)

<400> 186

```
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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
        35                  40                  45


Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
    50                  55                  60


Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65                  70                  75                  80


Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
                85                  90                  95


Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
            100                 105                 110


Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
        115                 120                 125


Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu
    130                 135                 140


Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu
145                 150                 155                 160


Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp
                165                 170                 175


Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala Ala Ile Gly
            180                 185                 190


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

```
Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn
    210                 215                 220

Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro
225                 230                 235                 240

Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly
                245                 250                 255

Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Glu Val
            260                 265                 270

Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu
        275                 280                 285

Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe
    290                 295                 300

Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met
305                 310                 315                 320

Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu
                325                 330                 335

Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu
            340                 345                 350

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

Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415
```

```
Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 187
<211> 627

<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-5C2 CAR (amino acid)

<400> 187

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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
20 25 30

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
50 55 60

Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65 70 75 80

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
85 90 95

Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
115 120 125

Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
130 135 140

Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly
145 150 155 160

Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg
165 170 175

Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly
180 185 190

```
Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser
        195                 200                 205

Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu
    210                 215                 220

Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr
225                 230                 235                 240

Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp
                245                 250                 255

Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly
            260                 265                 270

Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly
        275                 280                 285

Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val
    290                 295                 300

Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg
305                 310                 315                 320

Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser
                325                 330                 335

Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser
            340                 345                 350

Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr
        355                 360                 365

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

Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val
385                 390                 395                 400
```

```
Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
                405                 410                 415

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
            420                 425                 430

Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
        435                 440                 445

Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
    450                 455                 460

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
465                 470                 475                 480

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
                485                 490                 495

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
            500                 505                 510

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
        515                 520                 525

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
    530                 535                 540

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
545                 550                 555                 560

Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
                565                 570                 575

Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
            580                 585                 590

Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
        595                 600                 605

Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu
    610                 615                 620
```

Pro Pro Arg
625

<210> 188
<211> 637
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-5C3 CAR (amino acid)

<400> 188

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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
20 25 30

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
50 55 60

Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65 70 75 80

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
85 90 95

Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
115 120 125

Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
130 135 140

Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly
145 150 155 160

```
Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly
                165                 170                 175

Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly
            180                 185                 190

Lys Glu Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser
        195                 200                 205

Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn
    210                 215                 220

Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp
225                 230                 235                 240

Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala
                245                 250                 255

Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr
            260                 265                 270

Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
        275                 280                 285

Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro
    290                 295                 300

Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr
305                 310                 315                 320

Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly
                325                 330                 335

Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser
            340                 345                 350

Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn
        355                 360                 365
```

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

Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln
385                 390                 395                 400

Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr Thr
                405                 410                 415

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
            420                 425                 430

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
        435                 440                 445

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
    450                 455                 460

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
465                 470                 475                 480

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
                485                 490                 495

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
            500                 505                 510

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
        515                 520                 525

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
    530                 535                 540

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
545                 550                 555                 560

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
                565                 570                 575

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
            580                 585                 590
```

```
Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
        595                 600                 605


Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
    610                 615                 620


Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
625                 630                 635


<210>  189
<211>  647
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  AIO-5C4 CAR (amino acid)

<400>  189

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 Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
        35                  40                  45


Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys
    50                  55                  60


Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr
65                  70                  75                  80


Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala
                85                  90                  95


Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr
            100                 105                 110


Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly
        115                 120                 125
```

```
Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
    130                 135                 140

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val
145                 150                 155                 160

Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser
                165                 170                 175

Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe
            180                 185                 190

Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala Ala Ile Gly Gln
        195                 200                 205

Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr
    210                 215                 220

Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr
225                 230                 235                 240

Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly
                245                 250                 255

Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln
            260                 265                 270

Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly
        275                 280                 285

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu
    290                 295                 300

Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu
305                 310                 315                 320

Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp
                325                 330                 335
```

```
Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala
            340                 345                 350

Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg
        355                 360                 365

Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu
    370                 375                 380

Ser Ser Val Thr Pro Glu Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser
385                 390                 395                 400

Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr
                405                 410                 415

Gln Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro
            420                 425                 430

Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro
        435                 440                 445

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
    450                 455                 460

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
465                 470                 475                 480

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly
                485                 490                 495

Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val
            500                 505                 510

Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu
        515                 520                 525

Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp
    530                 535                 540

Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
545                 550                 555                 560
```

```
Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
                565                 570                 575


Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
            580                 585                 590


Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
        595                 600                 605


Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
    610                 615                 620


Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
625                 630                 635                 640


Met Gln Ala Leu Pro Pro Arg
                645


<210>  190
<211>  624
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  AIO-6C1 CAR (amino acid)

<400>  190

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 Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg
        35                  40                  45


Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60


Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr
65                  70                  75                  80
```

```
Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Gly
                85                  90                  95

Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser
        115                 120                 125

Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly
    130                 135                 140

Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln
145                 150                 155                 160

Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn
                165                 170                 175

Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg
            180                 185                 190

Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val
        195                 200                 205

Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn
    210                 215                 220

Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met
225                 230                 235                 240

Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser
                245                 250                 255

Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
            260                 265                 270

Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
        275                 280                 285
```

```
Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
    290                 295                 300

Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro
305                 310                 315                 320

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
                325                 330                 335

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
            340                 345                 350

Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
    370                 375                 380

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510
```

```
Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525


Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540


Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560


Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575


Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590


Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605


Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615                 620


<210>  191
<211>  634
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  AIO-6C2 CAR (amino acid)

<400>  191

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 Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg
        35                  40                  45


Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60
```

```
Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr
65                  70                  75                  80

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Gly
                85                  90                  95

Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser
        115                 120                 125

Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly
    130                 135                 140

Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly
145                 150                 155                 160

Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala
                165                 170                 175

Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala
            180                 185                 190

Pro Gly Lys Glu Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly
        195                 200                 205

Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu
    210                 215                 220

Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro
225                 230                 235                 240

Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu
                245                 250                 255

Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln
            260                 265                 270
```

```
Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu
        275                 280                 285

Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr
    290                 295                 300

Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu
305                 310                 315                 320

Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp
                325                 330                 335

Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe
            340                 345                 350

Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr
        355                 360                 365

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

Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly
385                 390                 395                 400

Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala
                405                 410                 415

Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser
            420                 425                 430

Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr
        435                 440                 445

Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala
    450                 455                 460

Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys
465                 470                 475                 480

Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met
                485                 490                 495
```

```
Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe
            500                 505                 510

Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg
        515                 520                 525

Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn
    530                 535                 540

Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg
545                 550                 555                 560

Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro
                565                 570                 575

Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala
            580                 585                 590

Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His
        595                 600                 605

Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp
    610                 615                 620

Ala Leu His Met Gln Ala Leu Pro Pro Arg
625                 630
```

<210> 192
<211> 644
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-6C3 CAR (amino acid)

<400> 192

```
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 Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30
```

```
Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg
        35                  40                  45

Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr
65                  70                  75                  80

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Gly
                85                  90                  95

Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser
        115                 120                 125

Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly
    130                 135                 140

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln
145                 150                 155                 160

Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly Ser Leu Arg
                165                 170                 175

Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn Cys Met Gly
            180                 185                 190

Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val Ala Ala Ile
        195                 200                 205

Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp Ser Val Lys Gly Arg
    210                 215                 220

Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln Met
225                 230                 235                 240
```

```
Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala Ala Ala
                245                 250                 255

Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr Arg Asn Trp
            260                 265                 270

Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly
        275                 280                 285

Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser
    290                 295                 300

Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr
305                 310                 315                 320

Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe
                325                 330                 335

Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala
            340                 345                 350

Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile
        355                 360                 365

Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val
    370                 375                 380

Thr Pro Glu Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val
385                 390                 395                 400

Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr
                405                 410                 415

Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro
            420                 425                 430

Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys
        435                 440                 445

Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala
    450                 455                 460
```

```
Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu
465                 470                 475                 480

Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys
                485                 490                 495

Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr
            500                 505                 510

Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly
        515                 520                 525

Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala
    530                 535                 540

Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg
545                 550                 555                 560

Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu
                565                 570                 575

Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn
            580                 585                 590

Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met
        595                 600                 605

Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly
    610                 615                 620

Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala
625                 630                 635                 640

Leu Pro Pro Arg
```

<210> 193
<211> 654
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-6C4 CAR (amino acid)

<400> 193

```
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 Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg
        35                  40                  45


Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60


Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr
65                  70                  75                  80


Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Gly
                85                  90                  95


Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr
            100                 105                 110


Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser
        115                 120                 125


Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly
    130                 135                 140


Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
145                 150                 155                 160


Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala
                165                 170                 175


Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser
            180                 185                 190
```

```
Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu
        195                 200                 205

Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp
    210                 215                 220

Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr
225                 230                 235                 240

Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr
                245                 250                 255

Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala
            260                 265                 270

Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
        275                 280                 285

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
    290                 295                 300

Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys
305                 310                 315                 320

Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile
                325                 330                 335

Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys
            340                 345                 350

Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr
        355                 360                 365

Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu
    370                 375                 380

Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp Thr Ala
385                 390                 395                 400

Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly
                405                 410                 415
```

```
Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr
            420                 425                 430

Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser
        435                 440                 445

Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly
    450                 455                 460

Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp
465                 470                 475                 480

Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile
                485                 490                 495

Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys
            500                 505                 510

Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys
        515                 520                 525

Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val
    530                 535                 540

Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn
545                 550                 555                 560

Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val
                565                 570                 575

Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg
            580                 585                 590

Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys
        595                 600                 605

Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg
    610                 615                 620
```

Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys
625 630 635 640

Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
645 650

<210> 194
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-7C1 CAR (amino acid)

<400> 194

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
20 25 30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
35 40 45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
85 90 95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
100 105 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
115 120 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
130 135 140

```
Ser Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly
145                 150                 155                 160

Gly Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser
                165                 170                 175

Gly Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro
            180                 185                 190

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

Pro Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp
    210                 215                 220

Asn Ala Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu
225                 230                 235                 240

Asp Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly
                245                 250                 255

Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Glu Val
            260                 265                 270

Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu
        275                 280                 285

Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe
    290                 295                 300

Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met
305                 310                 315                 320

Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu
                325                 330                 335

Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu
            340                 345                 350

Gln Leu Ser Ser Val Thr Pro Glu Asp Thr Ala Val Tyr Tyr Cys Gly
        355                 360                 365
```

```
Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575
```

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
580 585 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
595 600 605

Leu His Met Gln Ala Leu Pro Pro Arg
610 615

<210> 195
<211> 627
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-7C2 CAR (amino acid)

<400> 195

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
20 25 30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
35 40 45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
85 90 95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
100 105 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
115 120 125

```
Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu
145                 150                 155                 160

Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Leu Arg Leu
                165                 170                 175

Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp
            180                 185                 190

Leu Arg Gln Ala Pro Gly Lys Gly Leu Glu Ser Val Ser Asp Ile Thr
        195                 200                 205

Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe
    210                 215                 220

Thr Ile Ser Arg Asp Asn Ala Lys Asn Met Leu Tyr Leu Glu Met Asn
225                 230                 235                 240

Ser Leu Lys Thr Glu Asp Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp
                245                 250                 255

Arg Thr Leu Thr Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly
            260                 265                 270

Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly
        275                 280                 285

Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val
    290                 295                 300

Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg
305                 310                 315                 320

Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser
                325                 330                 335

Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser
            340                 345                 350
```

```
Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr
        355                 360                 365

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

Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val
385                 390                 395                 400

Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
                405                 410                 415

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
            420                 425                 430

Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
        435                 440                 445

Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
    450                 455                 460

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
465                 470                 475                 480

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
                485                 490                 495

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
            500                 505                 510

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
        515                 520                 525

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
    530                 535                 540

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
545                 550                 555                 560
```

```
Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
                565                 570                 575


Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
            580                 585                 590


Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
        595                 600                 605


Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu
    610                 615                 620


Pro Pro Arg
625
```

<210> 196
<211> 637
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-7C3 CAR (amino acid)

<400> 196

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
            20                  25                  30


Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
        35                  40                  45


Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60


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


Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
                85                  90                  95
```

```
Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
145                 150                 155                 160

Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly
                165                 170                 175

Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn
            180                 185                 190

Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly Leu Glu Ser
        195                 200                 205

Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser
    210                 215                 220

Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Met Leu
225                 230                 235                 240

Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr Ala Val Tyr Tyr
                245                 250                 255

Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Gln Val Thr
            260                 265                 270

Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
        275                 280                 285

Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro
    290                 295                 300

Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr
305                 310                 315                 320
```

```
Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly
                325                 330                 335

Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser
            340                 345                 350

Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn
        355                 360                 365

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

Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln
385                 390                 395                 400

Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr Thr
                405                 410                 415

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
            420                 425                 430

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
        435                 440                 445

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
    450                 455                 460

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
465                 470                 475                 480

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
                485                 490                 495

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
            500                 505                 510

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
        515                 520                 525
```

```
Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
    530                 535                 540

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
545                 550                 555                 560

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
                565                 570                 575

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
            580                 585                 590

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
        595                 600                 605

Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
    610                 615                 620

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
625                 630                 635
```

<210> 197
<211> 647
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-7C4 CAR (amino acid)

<400> 197

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
            20                  25                  30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
        35                  40                  45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60
```

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


Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
                85                  90                  95


Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
            100                 105                 110


Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125


Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140


Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
145                 150                 155                 160


Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
                165                 170                 175


Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
            180                 185                 190


Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
        195                 200                 205


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


Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
225                 230                 235                 240


Ala Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp
                245                 250                 255


Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
            260                 265                 270


Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly
        275                 280                 285
```

```
Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu
    290                 295                 300

Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu
305                 310                 315                 320

Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp
                325                 330                 335

Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala
            340                 345                 350

Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg
        355                 360                 365

Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu
    370                 375                 380

Ser Ser Val Thr Pro Glu Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser
385                 390                 395                 400

Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr
                405                 410                 415

Gln Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro
            420                 425                 430

Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro
        435                 440                 445

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
    450                 455                 460

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
465                 470                 475                 480

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly
                485                 490                 495
```

```
Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val
            500                 505                 510

Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu
        515                 520                 525

Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp
    530                 535                 540

Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
545                 550                 555                 560

Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
                565                 570                 575

Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
            580                 585                 590

Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
        595                 600                 605

Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
    610                 615                 620

Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
625                 630                 635                 640

Met Gln Ala Leu Pro Pro Arg
                645
```

<210> 198
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-8C1 CAR (amino acid)

<400> 198

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
            20                  25                  30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
        35                  40                  45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro
145                 150                 155                 160

Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro
225                 230                 235                 240
```

```
Glu Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
               245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
               325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
               405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445
```

```
Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 199
<211> 627
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-8C2 CAR (amino acid)

<400> 199

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
            20                  25                  30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
        35                  40                  45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu
145                 150                 155                 160

Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu
                165                 170                 175

Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp
            180                 185                 190

Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala
        195                 200                 205

Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg
    210                 215                 220
```

```
Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu
225                 230                 235                 240

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

Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr
            260                 265                 270

Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
        275                 280                 285

Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
    290                 295                 300

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr
305                 310                 315                 320

Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly Leu Glu Ser Val
                325                 330                 335

Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val
            340                 345                 350

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Met Leu Tyr
        355                 360                 365

Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr Ala Val Tyr Tyr Cys
    370                 375                 380

Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr Gln Val Thr Val
385                 390                 395                 400

Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
                405                 410                 415

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
            420                 425                 430
```

```
Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
        435                 440                 445

Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
    450                 455                 460

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
465                 470                 475                 480

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
                485                 490                 495

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
            500                 505                 510

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
        515                 520                 525

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
    530                 535                 540

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
545                 550                 555                 560

Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
                565                 570                 575

Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
            580                 585                 590

Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
        595                 600                 605

Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu
    610                 615                 620

Pro Pro Arg
625
```

<210> 200
<211> 637

<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-8C3 CAR (amino acid)

<400> 200

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
            20                  25                  30


Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
        35                  40                  45


Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60


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


Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
                85                  90                  95


Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
            100                 105                 110


Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125


Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140


Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
145                 150                 155                 160


Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser
                165                 170                 175


Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile Thr Thr
            180                 185                 190
```

```
Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys Gly Leu
        195                 200                 205

Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr Ser Pro
    210                 215                 220

Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu Asn Gln
225                 230                 235                 240

Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp Thr Ala Val Tyr
                245                 250                 255

Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly Gln Asn
            260                 265                 270

Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly Gly Ser
        275                 280                 285

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu
    290                 295                 300

Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys
305                 310                 315                 320

Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg
                325                 330                 335

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

Gly Asp Arg Pro Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile
        355                 360                 365

Ser Arg Asp Asn Ala Lys Asn Met Leu Tyr Leu Glu Met Asn Ser Leu
    370                 375                 380

Lys Thr Glu Asp Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr
385                 390                 395                 400
```

```
Leu Thr Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr Ser Thr Thr
                405                 410                 415

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
            420                 425                 430

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
        435                 440                 445

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
    450                 455                 460

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
465                 470                 475                 480

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
                485                 490                 495

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
            500                 505                 510

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
        515                 520                 525

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
    530                 535                 540

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
545                 550                 555                 560

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
                565                 570                 575

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
            580                 585                 590

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
        595                 600                 605

Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
    610                 615                 620
```

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
625 630 635

<210> 201
<211> 647
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-8C4 CAR (amino acid)

<400> 201

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
20 25 30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
35 40 45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
85 90 95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
100 105 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
115 120 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
130 135 140

Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
145 150 155 160

```
Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly
                165                 170                 175

Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly
            180                 185                 190

Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro
        195                 200                 205

Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser
    210                 215                 220

Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp
225                 230                 235                 240

Thr Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu
                245                 250                 255

Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val
            260                 265                 270

Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        275                 280                 285

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
    290                 295                 300

Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly Leu Val
305                 310                 315                 320

Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr
                325                 330                 335

Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly Lys Gly
            340                 345                 350

Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro Tyr Tyr
        355                 360                 365
```

```
Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys
    370                 375                 380

Asn Met Leu Tyr Leu Glu Met Asn Ser Leu Lys Thr Glu Asp Thr Ala
385                 390                 395                 400

Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln Gly Thr
                405                 410                 415

Gln Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro
            420                 425                 430

Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro
        435                 440                 445

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
    450                 455                 460

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
465                 470                 475                 480

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly
                485                 490                 495

Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val
            500                 505                 510

Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu
        515                 520                 525

Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp
    530                 535                 540

Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
545                 550                 555                 560

Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
                565                 570                 575

Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
            580                 585                 590
```

Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
595 600 605

Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
610 615 620

Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
625 630 635 640

Met Gln Ala Leu Pro Pro Arg
645

<210> 202
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-9C1 CAR (amino acid)

<400> 202

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 Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu
20 25 30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg
35 40 45

Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
50 55 60

Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr
65 70 75 80

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Gly
85 90 95

Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr
100 105 110

```
Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser
        115                 120                 125

Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly
    130                 135                 140

Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys
145                 150                 155                 160

Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala Ser Ile
                165                 170                 175

Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro Gly Lys
            180                 185                 190

Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr Thr Tyr
        195                 200                 205

Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr Ser Glu
    210                 215                 220

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

Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr Thr Gly
                245                 250                 255

Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly
            260                 265                 270

Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala
        275                 280                 285

Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser
    290                 295                 300

Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu
305                 310                 315                 320
```

```
Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp
                325                 330                 335

Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr
            340                 345                 350

Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr
        355                 360                 365

Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala
    370                 375                 380

Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540
```

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545 550 555 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
565 570 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
580 585 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
595 600 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
610 615 620

<210> 203
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-10C1 CAR (amino acid)

<400> 203

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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
35 40 45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65 70 75 80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
85 90 95

```
Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val
145                 150                 155                 160

Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala
225                 230                 235                 240

Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300
```

```
Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Gly Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525
```

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
530 535 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545 550 555 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
565 570 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
580 585 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
595 600 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
610 615 620

<210> 204
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-11C1 CAR (amino acid)

<400> 204

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 Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
35 40 45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65 70 75 80

```
Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95

Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val
145                 150                 155                 160

Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Arg Thr
                165                 170                 175

Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu
            180                 185                 190

Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro Tyr Tyr
        195                 200                 205

Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Gly Lys
    210                 215                 220

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

Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp Ser Gly
                245                 250                 255

Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Gly Gly Gly
            260                 265                 270

Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala
        275                 280                 285
```

```
Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser
    290                 295                 300

Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu
305                 310                 315                 320

Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Val Asp
                325                 330                 335

Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala Lys Asn Thr
            340                 345                 350

Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr
        355                 360                 365

Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala
    370                 375                 380

Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510
```

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
515 520 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
530 535 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545 550 555 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
565 570 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
580 585 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
595 600 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
610 615 620

<210> 205
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-12C1 CAR (amino acid)

<400> 205

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
20 25 30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
35 40 45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly
145                 150                 155                 160

Gly Leu Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser
                165                 170                 175

Gly Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro
            180                 185                 190

Gly Lys Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser
        195                 200                 205

Pro Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp
    210                 215                 220

Asn Gly Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu
225                 230                 235                 240

Asp Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser
                245                 250                 255

Trp Ser Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
            260                 265                 270
```

```
Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu
        275                 280                 285

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
    290                 295                 300

Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln Pro Pro
305                 310                 315                 320

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
                325                 330                 335

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
            340                 345                 350

Ser Glu Asn Gln Phe Tyr Leu Gln Leu Ser Ser Val Thr Pro Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
    370                 375                 380

Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495
```

```
Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615                 620
```

<210> 206
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> AIO-13C1 CAR

<400> 206

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser
            20                  25                  30

Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn
        35                  40                  45
```

```
Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ala
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr
            100                 105                 110

Ala Met Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Pro
145                 150                 155                 160

Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

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

Glu Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255
```

```
Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Gln Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Ala Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Glu Arg Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Gly Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Lys Pro Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480
```

```
Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495


Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510


Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525


Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540


Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560


Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575


Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590


Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605


Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615                 620


<210>  207
<211>  617
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  huAIO-100 CAR (amino acid)

<400>  207

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30
```

```
Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
        35                  40                  45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160

Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240
```

```
Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Leu Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Ile Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Trp Gly Gln
    370                 375                 380

Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460
```

```
Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480


Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495


Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510


Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525


Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540


Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560


Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575


Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590


Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605


Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615


<210>  208
<211>  617
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  huAIO-133 CAR (amino acid)

<400>  208

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
        35                  40                  45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160

Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220
```

```
Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240

Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445
```

```
Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 209
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-167 CAR (amino acid)

<400> 209

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
        35                  40                  45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160

Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205
```

```
Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240

Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430
```

```
Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 210
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-180 CAR (amino acid)

<400> 210

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
        35                  40                  45


Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60


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


Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95


Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110


Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125


Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140


Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160


Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175


Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190
```

```
Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240

Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Trp Val Ala Ala Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ser Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415
```

```
Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615                 620
```

<210> 211
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-203 CAR (amino acid)

<400> 211

```
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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu
            20                  25                  30


Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
        35                  40                  45


Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60


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


Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95


Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110


Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125


Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140


Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160


Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175
```

```
Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240

Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ser Lys Asn Thr Val Tyr Leu Gln Met Ser Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400
```

```
Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605
```

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
610 615 620

<210> 212
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-213 CAR (amino acid)

<400> 212

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val
20 25 30

Val Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
35 40 45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
85 90 95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
115 120 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
130 135 140

Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145 150 155 160

```
Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240

Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Trp Val Ala Ala Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ser Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380
```

```
Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590
```

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
595 600 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
610 615 620

<210> 213
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-217 CAR (amino acid)

<400> 213

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val
20 25 30

Val Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
35 40 45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
85 90 95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
115 120 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
130 135 140

```
Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160


Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175


Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190


Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205


Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220


Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240


Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255


Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270


Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285


Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300


Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320


Lys Gly Leu Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335


Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350


Ser Lys Asn Thr Val Tyr Leu Gln Met Ser Ser Leu Arg Ala Glu Asp
        355                 360                 365
```

```
Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575
```

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
580 585 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
595 600 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
610 615 620

<210> 214
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-227 CAR (amino acid)

<400> 214

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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
35 40 45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65 70 75 80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
85 90 95

Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
100 105 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
115 120 125

```
Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val
145                 150                 155                 160

Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Trp Val Ala Ala Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350
```

```
Ser Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560
```

```
Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575


Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590


Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605


Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615                 620


<210>  215
<211>  624
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  huAIO-230 CAR (amino acid)

<400>  215

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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95


Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110
```

```
Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val
145                 150                 155                 160

Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335
```

```
Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ser Lys Asn Thr Val Tyr Leu Gln Met Ser Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540
```

```
Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560


Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575


Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590


Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605


Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615                 620


<210>  216
<211>  624
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  huAIO-240 CAR (amino acid)

<400>  216

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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95
```

```
Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val
145                 150                 155                 160

Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320
```

```
Lys Gly Leu Glu Trp Val Ala Ala Val Asp Trp Ser Gly Gly Ser Pro
               325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ser Lys Asn Thr Val Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
               405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
               485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525
```

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
530 535 540

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545 550 555 560

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
565 570 575

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
580 585 590

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
595 600 605

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
610 615 620

<210> 217
<211> 624
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-243 CAR (amino acid)

<400> 217

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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
35 40 45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65 70 75 80

```
Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95

Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val
145                 150                 155                 160

Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300
```

```
Arg Thr Phe Ser Ser Tyr Asn Met Gly Trp Phe Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Phe Val Ala Val Val Asp Trp Ser Gly Gly Ser Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ser Lys Asn Thr Val Tyr Leu Gln Met Ser Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Gly Arg Val Gln Tyr Gly Ser Ser Trp
    370                 375                 380

Ser Gly Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Thr
385                 390                 395                 400

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
                405                 410                 415

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
            420                 425                 430

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
        435                 440                 445

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
    450                 455                 460

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
465                 470                 475                 480

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
                485                 490                 495

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
            500                 505                 510
```

```
Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
        515                 520                 525


Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
    530                 535                 540


Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
545                 550                 555                 560


Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
                565                 570                 575


Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
            580                 585                 590


Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
        595                 600                 605


Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615                 620


<210>  218
<211>  617
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  huAIO-267 CAR (amino acid)

<400>  218

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val
            20                  25                  30


Val Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
        35                  40                  45


Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60
```

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


Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95


Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110


Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125


Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140


Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160


Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175


Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190


Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205


Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220


Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240


Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255


Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270


Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Leu Glu Ser Gly Gly Gly
        275                 280                 285
```

```
Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Ile Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Trp Gly Gln
    370                 375                 380

Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495
```

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
500 505 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
515 520 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
530 535 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545 550 555 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
565 570 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
580 585 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
595 600 605

Leu His Met Gln Ala Leu Pro Pro Arg
610 615

<210> 219
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-300 CAR (amino acid)

<400> 219

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val
20 25 30

Val Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
35 40 45

```
Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160

Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240

Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255

Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270
```

```
Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480
```

```
Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495


Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510


Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525


Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540


Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560


Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575


Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590


Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605


Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615


<210>  220
<211>  617
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  huAIO-333 CAR (amino acid)

<400>  220

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 Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val
            20                  25                  30
```

```
Val Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn
        35                  40                  45

Ile Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys
    50                  55                  60

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

Tyr Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser
                85                  90                  95

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
            100                 105                 110

Ala Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu
        115                 120                 125

Arg Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val
    130                 135                 140

Ser Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Glu Ser Gly Pro
145                 150                 155                 160

Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser
                165                 170                 175

Gly Ala Ser Ile Thr Thr Gly Glu Phe Tyr Trp Asn Trp Phe Arg Gln
            180                 185                 190

Pro Pro Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly
        195                 200                 205

Ser Thr Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg
    210                 215                 220

Asp Thr Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala
225                 230                 235                 240

Ala Asp Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala
                245                 250                 255
```

```
Val Thr Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460
```

```
Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 221
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-433 CAR (amino acid)

<400> 221

```
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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
            20                  25                  30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95

Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val
145                 150                 155                 160

Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240
```

```
Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Leu Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Ile Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Trp Gly Gln
    370                 375                 380

Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445
```

```
Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 222
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-467 CAR (amino acid)

<400> 222

```
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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
            20                  25                  30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95

Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val
145                 150                 155                 160

Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220
```

```
Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430
```

```
Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 223
<211> 617
<212> PRT
<213> Artificial Sequence

<220>

<223> huAIO-500 CAR (amino acid)

<400> 223

```
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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95


Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110


Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125


Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140


Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val
145                 150                 155                 160


Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175


Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190


Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205
```

```
Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415
```

```
Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 224
<211> 617

<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-600 CAR (amino acid)

<400> 224

```
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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95


Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110


Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125


Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140


Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val
145                 150                 155                 160


Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175


Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190
```

```
Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Leu Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Ile Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Trp Gly Gln
    370                 375                 380

Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400
```

```
Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605

Leu His Met Gln Ala Leu Pro Pro Arg
    610                 615
```

<210> 225
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-633 CAR (amino acid)

<400> 225

```
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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
            20                  25                  30


Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
        35                  40                  45


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


Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65                  70                  75                  80


Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
                85                  90                  95


Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
            100                 105                 110


Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
        115                 120                 125


Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
    130                 135                 140


Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val
145                 150                 155                 160


Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175
```

```
Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365

Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380
```

```
Gly Thr Met Val Thr Val Ser Ser Thr Ser Thr Thr Thr Pro Ala Pro
385                 390                 395                 400

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
        595                 600                 605
```

Leu His Met Gln Ala Leu Pro Pro Arg
610 615

<210> 226
<211> 617
<212> PRT
<213> Artificial Sequence

<220>
<223> huAIO-667 CAR (amino acid)

<400> 226

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 Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ala
35 40 45

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

Gly Lys Gly Leu Glu Trp Met Gly Ala Ile Ala Ala Ser Gly Ser Thr
65 70 75 80

Thr Tyr Ser Pro Ser Phe Glu Ser Arg Thr Ser Ile Ser Arg Asp Thr
85 90 95

Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp
100 105 110

Thr Ala Val Tyr Tyr Cys Gly Arg Ser Phe Gly Val Ala Ala Val Thr
115 120 125

Thr Gly Gln Asn Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly
130 135 140

Gly Gly Gly Ser Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val
145 150 155 160

```
Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Asn Ile
                165                 170                 175

Asn Ser Arg Asn Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly
            180                 185                 190

Arg Glu Gly Val Ala Ala Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr
        195                 200                 205

Val Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Leu Asp Asn Ser Lys
    210                 215                 220

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

Val Tyr Tyr Cys Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg
                245                 250                 255

Ser Ala Asp Tyr Arg Asn Trp Gly Gln Gly Thr Leu Val Thr Val Ser
            260                 265                 270

Ser Gly Gly Gly Gly Ser Gln Ile Gln Leu Val Glu Ser Gly Gly Gly
        275                 280                 285

Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly
    290                 295                 300

Phe Thr Phe Ser Asn Tyr Pro Met Thr Trp Leu Arg Gln Ala Pro Gly
305                 310                 315                 320

Lys Gly Leu Glu Ser Val Ser Asp Ile Thr Ser Gly Gly Asp Arg Pro
                325                 330                 335

Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
            340                 345                 350

Ala Lys Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
        355                 360                 365
```

```
Thr Ala Val Tyr Tyr Cys Ala Thr Trp Asp Arg Thr Leu Thr Gly Gln
    370                 375                 380

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

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
                405                 410                 415

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
            420                 425                 430

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
        435                 440                 445

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
    450                 455                 460

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
465                 470                 475                 480

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
                485                 490                 495

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
            500                 505                 510

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
        515                 520                 525

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
    530                 535                 540

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
545                 550                 555                 560

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
                565                 570                 575

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
            580                 585                 590
```

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
595 600 605

Leu His Met Gln Ala Leu Pro Pro Arg
610 615

<210> 227
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-2C1 CAR (nucleic acid)

<400> 227
atggcgcttc cggtgacggc actgctgctg cccctggctt tgctactaca cgccgcccgc 60

cctcagatcc agctggtgga gagcggcggc ggactggtgc agccgggagg ctcgctgcgt 120

ctttcctgtg ccgcttccgg cttcaccttt tcaaattacc caatgacctg gctgcgacag 180

gcccccggga agggcctcga gagcgtttcc gacatcactt ctggagggga caggccctat 240

tacgcggaca gcgtcaaggg aaggtttacc atctcgcgcg acaacgcgaa gaacatgctg 300

tacctggaga tgaatagtct gaagaccgaa gatactgcgg tgtactactg tgctacctgg 360

gaccgcaccc tgactggaca gggcacccag gtcacagtct cctctggcgg cggcgggtcg 420

gaggtgcaat tagtggagtc cggccctggt ctcgtgaagc cctcacagac tctgagcctg 480

acctgcactg tatcgggtgc ttctatcacc acaggcgagt tctattggaa ttggttcaga 540

cagccacctg gcaaaggtct ggagtggatg ggcgccatcg cagctagcgg ctccaccacc 600

tactcccct cttttgagag ccgtaccagc atctctcggg acacctccga gaaccagttc 660

tacctgcagc tgtcctcggt cactcccgag gacacagccg tgtactattg tgggcgctcc 720

ttcggcgtgg cagctgtgac cacaggacag aaccgcggcc agggcaccca ggtcaccgtg 780

tcgtccggtg gtggtggctc ccaggttcaa ttggtggaga gtggtggcgg ctctgtgcag 840

gccggcggtt ctctgcgcct gtcatgcggg gcctcgggca acattaactc ccgcaactgc 900

atggggtggt tccgccaggc cccgggcaag gagcgcgagg gcgtcgctgc tatcggtcag 960

gtcaccggtc gcagctacta cgtggattct gttaaaggcc gcttcacgat ttctctcgat 1020

aacgccaaga acacgctcta cttgcagatg aacacgctca agcctgaaga caccgcgatg 1080

tattactgtg ccgcagcgcc ggggtgcctg ctgtccgccc tgcgtagtgc cgactaccgg 1140

aactggggcc aggggaccca ggtgaccgtg tcctccacta gtaccacgac gccagcgccg 1200

cgaccaccaa caccggcgcc caccatcgcg tcgcagcccc tgtccctgcg cccagaggcg 1260

tgccggccag cggcgggggg cgcagtgcac acgaggggcc tggacttcgc ctgtgatatc 1320

tacatctggg cgcccttggc cgggacttgt ggggtccttc tcctgtcact ggttatcacc 1380

ctttactgca aacggggcag aaagaaactc ctgtatatat tcaaacaacc atttatgaga 1440

ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1500

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 228
<211> 1884
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-2C2 CAR (nucleic acid)

<400> 228
atggcccttc cggtgactgc tctgctgctg cccctggcgc tgctgctcca cgccgctcgc 60

cctcagatcc agctggtgga gagcggaggc ggcttggtgc agccgggcgg ctccctgcgc 120

ctgtcatgcg ccgcttccgg cttcaccttt tcaaactacc cgatgacctg gctacgacag 180

gcccccggca aaggcctgga gagcgtgtct gacatcactt cgggggggga caggccctat 240

tacgcggaca gcgtcaaagg tcgcttcacc atctctcgcg acaacgccaa gaacatgctg 300

tacctcgaga tgaactccct gaagaccgag gacacggcag tctactactg tgccacctgg 360

gaccgcaccc tgaccggaca gggcacgcag gtcactgtct cctccggtgg cggaggatct 420

ggtggtggtg gctccgaggt gcaactggtg gagagtgggc cgggcttagt taagcccagt 480

cagactctga gcctcacctg taccgtgtcc ggtgcgagca tcaccaccgg cgagttctat 540

tggaactggt tccgccagcc acccggtaag ggcctggaat ggatgggcgc cattgcagcg 600

tctgggtcta ctacctactc cccatccttc gagagccgta caagtatctc gcgggacacc 660

tccgagaacc agttctactt gcagctttct tctgtgacac ctgaggacac cgccgtgtac 720

tactgtgggc gcagttttgg cgttgctgcc gttacgaccg gtcagaaccg cggacagggt 780

acccaggtaa ccgtctcctc cggcggtggg ggctccggag gcggaggctc ccaggtgcaa 840

ctggtggagt ctggtggagg gtcggtgcag gccggcggca gcttgcgttt gtcatgcggg 900

gcctcgggca acattaactc ccgcaactgc atggggtggt tcagacaggc tcctggcaag 960

gagcgcgagg gcgtggcggc catcggccag gtcaccggcc gctcgtacta cgtggattct 1020

gtgaagggtc gttttaccat cagcctggat aacgctaaga atactcttta cctgcagatg 1080

aacacactca agcctgaaga tacggctatg tattactgtg ctgctgcgcc cgggtgcctg 1140

ctcagcgcac ttaggagcgc ggactaccgg aattggggcc agggcaccca ggtcaccgtg 1200

tcgtccacta gtaccacgac gccagcgccg cgaccaccaa caccggcgcc caccatcgcg 1260

tcgcagcccc tgtccctgcg cccagaggcg tgccggccag cggcgggggg cgcagtgcac 1320

acgagggggc tggacttcgc ctgtgatatc tacatctggg cgcccttggc cgggacttgt 1380

ggggtccttc tcctgtcact ggttatcacc ctttactgca aacggggcag aaagaaactc 1440

ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1500

tgtagctgcc gatttccaga agaagaagaa ggaggatgtg aactgagagt gaagttcagc 1560

aggagcgcag acgccccgc gtaccagcag ggccagaacc agctctataa cgagctcaat 1620

ctaggacgaa gagaggagta cgatgttttg gacaagagac gtggccggga ccctgagatg 1680

gggggaaagc cgagaaggaa gaaccctcag gaaggcctgt acaatgaact gcagaaagat 1740

aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1800

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1860

atgcaggccc tgcccctcg ctaa 1884

<210> 229
<211> 1914
<212> DNA
<213> Artificial Sequence

<220>

<223> AIO-2C3 CAR (nucleic acid)

<400> 229

atggctctgc ccgtgacggc ttgctgctg ccacttgcac tgctgctgca cgccgcacgg 60

cctcagatcc agctggtaga gtctggaggg ggtctggtgc agccgggagg ctccctgcgt 120

ttgtcttgtg ccgcatcggg cttcacgttc agcaactacc ctatgacctg gctgcgtcag 180

gctccgggca aaggccttga gagcgtttcc gacatcacgt cgggggggga ccgcccctat 240

tacgcggaca gcgtgaaggg ccgtttcacc atctcccggg acaacgccaa gaatatgctg 300

tacctggaga tgaactccct caagaccgag gacaccgccg tctactactg tgctacctgg 360

gatcgaactc tgaccggcca gggcacccag gtcaccgtct cttctggtgg cggcggcagt 420

ggcggcggtg gttccggagg cggcggcagc gaggtgcagt tggtggagtc tggccctggc 480

ctggttaagc ccagtcagac tctttccctc acctgcaccg tgtccggcgc ctcaattacc 540

acaggcgagt tctattggaa ttggttccgc cagccccag gaaaggggct ggagtggatg 600

ggcgccatcg cggcctccgg ctctacgacc tactcccct cttttgagag ccggaccagc 660

atctctcgcg acacctcgga gaaccagttt tatctccagc tctcctctgt aactccggaa 720

gatacagccg tgtactactg cgggaggtcc ttcggtgtgg cggcggtgac tacaggacag 780

aaccgcggtc agggcaccca ggtcactgtc tcctcgggtg ggggcggctc cggtggaggc 840

ggtagcggag gcgggggcag ccaggtgcag ctggtggaaa gtggtggcgg ctccgtgcaa 900

gccggaggtt cattacgcct gtcctgtggc gcttccggca acattaactc ccgcaactgc 960

atgggctggt tccgccaggc tcccgggaag gagagagagg gcgtggctgc gatcggtcaa 1020

gtgaccggtc gcagctacta cgtggattct gtcaaaggga ggtttaccat ctcgctggac 1080

aacgctaaga acacgcttta cttgcagatg aacactctga agcctgaaga caccgccatg 1140

tattactgtg cggcggcccc ggggtgcctg ctctctgctc tacgctcggc ggactaccgc 1200

aactgggggc agggaaccca ggtcaccgtg agcagcacta gtaccacgac gccagcgccg 1260

cgaccaccaa caccggcgcc caccatcgcg tcgcagcccc tgtccctgcg cccagaggcg 1320

tgccggccag cggcgggggg cgcagtgcac acgagggggc tggacttcgc ctgtgatatc 1380

tacatctggg cgcccttggc cgggacttgt ggggtccttc tcctgtcact ggttatcacc 1440

ctttactgca aacggggcag aaagaaactc ctgtatatat tcaaacaacc atttatgaga 1500

ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1560

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1620

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1680

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1740

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1800

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1860

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1914

<210> 230
<211> 1944
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-2C4 CAR (nucleic acid)

<400> 230
atggccctgc cggtcacggc tctgctgctg cccctggcgc tgcttttgca cgccgctcgc 60

cctcagatcc agttggtgga gagcggcggc ggcctcgttc agccaggtgg ttccctgcgc 120

ctgagctgtg cggcctctgg ctttacgttc agcaactacc cgatgacctg gctccgtcaa 180

gcccccggaa agggtctgga aagcgtctcc gacatcacct ctggcggtga tcgaccctat 240

tacgcggaca gcgtgaaagg ccgcttcacc atttcccggg acaacgccaa gaacatgctt 300

tacctggaga tgaacagcct gaagaccgag gacacggccg tgtactactg tgccacctgg 360

gacaggacac tcacaggtca gggcacccag gttaccgtgt cgagcggagg cggagggtct 420

ggcggcggcg gctcgggcgg cgggggttcc ggaggcggcg gctcggaggt gcagctagtg 480

gagtcgggac ctggcttggt gaagccatcc cagacccttt cgctgacctg caccgtgtcc 540

ggtgcttcta tcacgaccgg cgagttctat tggaattggt tccgccagcc gcctggtaag 600

ggcttggagt ggatgggcgc catcgcggct tcgggatcga ccacctactc cccctccttc 660

gagtctcgca ccagcatctc tagggacact tccgagaacc agttctacct ccagctgagc 720

tcggtcactc cggaggatac tgccgtgtac tattgtgggc gttcctttgg tgtcgcggcc 780

gtgacaactg gtcagaaccg cggccagggc acccaggtca ccgtgagctc cggcggtggc 840

ggctccggcg gcgggggctc aggtggcgga ggatctgggg ggggtggtag tcaggtgcag 900

ctggtggaga gtgggggggg gtccgtgcag gccggcggtt ctctacggct ttcatgcggg 960

gcttccggca acattaactc ccgcaactgc atggggtggt tcagacaggc tcccggcaag 1020

gagcgcgagg gcgtggcggc aatcggacaa gtaactggtc gcagctacta cgtggactca 1080

gtaaagggcc gttttaccat ctctctggac aatgcaaaaa acacgctgta cctgcagatg 1140

aataccctga agcctgaaga tactgccatg tattactgtg ctgcagcccc cgggtgcctg 1200

ctgtcagctc tgcgctccgc ggactaccgc aactggggcc agggaaccca ggtcaccgtc 1260

agttctacta gtaccacgac gccagcgccg cgaccaccaa caccggcgcc caccatcgcg 1320

tcgcagcccc tgtccctgcg cccagaggcg tgccggccag cggcgggggg cgcagtgcac 1380

acgagggggc tggacttcgc ctgtgatatc tacatctggg cgcccttggc cgggacttgt 1440

ggggtccttc tcctgtcact ggttatcacc ctttactgca aacggggcag aaagaaactc 1500

ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1560

tgtagctgcc gatttccaga agaagaagaa ggaggatgtg aactgagagt gaagttcagc 1620

aggagcgcag acgcccccgc gtaccagcag ggccagaacc agctctataa cgagctcaat 1680

ctaggacgaa gagaggagta cgatgttttg gacaagagac gtggccggga ccctgagatg 1740

gggggaaagc cgagaaggaa gaaccctcag gaaggcctgt acaatgaact gcagaaagat 1800

aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1860

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1920

atgcaggccc tgcccctcg ctaa 1944

<210> 231
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-3C1 CAR (nucleic acid)

<400> 231
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ctgacctgca ctgtgagcgg tgcgtccatc acaactggcg agttctattg gaattggttc 180

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tccttcgggg tagcggccgt aaccacagga cagaaccgcg gccaagggac ccaggtcacg 420

gtgtcgtcgg gcggtggtgg ctcgcaggtg cagctggtgg agtccggagg cggctccgtg 480

caggccggcg ggtccctgcg tctgtcatgc ggggcctctg gcaacattaa ctcccgcaac 540

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caagttactg gccgtagcta ctacgtggat tctgtcaaag ggcgcttcac catctctttg 660

gataacgcca agaacactct ttacttgcag atgaacacgc tcaagcctga agacaccgcc 720

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ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 232
<211> 1884
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-3C2 CAR (nucleic acid)

<400> 232
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cctgaggtgc agctggtgga gagcggccct ggcttggtga agccctctca aactctgtcc 120

ctcacctgca ctgtatcagg cgcgtccatc acaaccggcg agttctattg gaattggttc 180

cgccagccgc cggggaaggg ccttgagtgg atgggggcaa tcgccgcgtc tggatcgacc 240

acctactccc cgtccttcga atcccgcacc agcatcagtc gggacacatc ggagaaccag 300

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ggaggcggca gcgtgcaggc cggcggatcc cttcgtctgt cttgcggtgc ttccggcaac 540

attaattccc gcaactgcat gggctggttc agacaggccc ctgggaagga gcgcgagggc 600

gtggctgcca tcggtcaggt caccggtcga tcctactacg tggactccgt aaaaggccgc 660

ttcaccatct cgctggacaa cgccaagaac actctttacc tgcagatgaa cacgctcaag 720

cctgaagata cggccatgta ttactgtgct gcagctcccg gctgcttgct gtctgctctg 780

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1800

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1860

atgcaggccc tgcccctcg ctaa 1884

<210> 233
<211> 1914
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-3C3 CAR (nucleic acid)

<400> 233
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cccgaggtgc agctggtgga gtcggggccc ggcttggtga aaccgagtca gacgctgagt 120

ctgacctgca ccgtgtccgg agctagcatc actaccgggg agttctattg gaactggttc 180

cgacagccgc ctggtaaagg ccttgaatgg atgggcgcca tcgcggcctc cggctcgacc 240

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ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1560

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ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1680

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1740

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1800

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1860

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1914

<210> 234
<211> 1944
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-3C4 CAR (nucleic acid)

<400> 234
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cctgaggtgc agctggtgga gtccggaccc gggctggtaa agccctctca gactctttcc 120

ctgacctgca ctgtctcagg cgcttccatc accacagggg agttctattg gaattggttc 180

cgccagccgc ctggcaaagg cttggaatgg atgggcgcca tcgcggcttc tgggtcgacc 240

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cagccagggg gctcccttcg actgtcgtgt gctgcatccg gcttcacgtt tagcaactat 1020

ccgatgacct ggctacgcca ggctcccggg aagggtctgg agagcgtgag tgacatcacc 1080

tctggcggtg atcgtcccta ttacgcggac agcgttaagg gccgcttcac catctctcgc 1140

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gtgtactact gtgccacctg ggaccgcacg ctcaccggcc agggcaccca ggtcaccgtg 1260

tcgtccacta gtaccacgac gccagcgccg cgaccaccaa caccggcgcc caccatcgcg 1320

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acgagggggc tggacttcgc ctgtgatatc tacatctggg cgcccttggc cgggacttgt 1440

ggggtccttc tcctgtcact ggttatcacc ctttactgca aacggggcag aaagaaactc 1500

ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1560

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1860

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1920

atgcaggccc tgcccctcg ctaa 1944

<210> 235
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-4C1 CAR (nucleic acid)

<400> 235
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cctgaggtgc agctggtgga gtccgggccc ggtctggtta agcctagcca gaccctgtcc 120

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cagccgggag gatcccttcg cctgtcttgt gccgccagcg gctttacatt cagcaactac 540

cccatgacct ggctccgtca ggccccgggc aagggcctgg agtccgtgtc cgacatcacc 600

agcggagggg acaggcccta ttacgcggac tccgtgaagg gccgcttcac catctcgcgc 660

gacaatgcca agaacatgct ttacctggag atgaactccc tgaagacgga agataccgcc 720

gtgtactact gtgccacttg ggatcgtacc ctcaccggcc aaggcactca ggttaccgtc 780

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ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 236
<211> 1884
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-4C2 CAR (nucleic acid)

<400> 236
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cctgaggtgc agttggtgga atctgggccg ggtttagtca agccgagcca aactctgagc 120

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cgccagccac cgggcaaagg cctggagtgg atgggcgcta tcgcggcttc cgggtccacg 240

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agttcgacta gtaccacgac gccagcgccg cgaccaccaa caccggcgcc caccatcgcg 1260

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acgagggggc tggacttcgc ctgtgatatc tacatctggg cgcccttggc cgggacttgt 1380

ggggtccttc tcctgtcact ggttatcacc ctttactgca aacggggcag aaagaaactc 1440

ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1500

tgtagctgcc gatttccaga agaagaagaa ggaggatgtg aactgagagt gaagttcagc 1560

aggagcgcag acgcccccgc gtaccagcag ggccagaacc agctctataa cgagctcaat 1620

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cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1860

atgcaggccc tgcccctcg ctaa 1884

<210> 237
<211> 1914
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-4C3 CAR (nucleic acid)

<400> 237
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cccgaggtgc agcttgtgga gtcgggaccc ggcctcgtaa agccctctca aactttgagc 120

ctgacctgta ctgtctctgg cgctagcatt accacaggcg agttctattg gaactggttc 180

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gccgcttctg gcttcacctt ttcaaattac ccaatgacct ggctccgcca ggccccgggc 600

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aacgcgaaga acactctgta cttgcagatg aacacgctca agcctgaaga caccgccatg 1140

tattactgtg ctgcggcccc tgggtgcctg ctgagcgcgc ttcgtagcgc agattacagg 1200

aactggggcc agggtaccca ggtcacagtg tcctccacta gtaccacgac gccagcgccg 1260

cgaccaccaa caccggcgcc caccatcgcg tcgcagcccc tgtccctgcg cccagaggcg 1320

tgccggccag cggcgggggg cgcagtgcac acgagggggc tggacttcgc ctgtgatatc 1380

tacatctggg cgcccttggc cgggacttgt ggggtccttc tcctgtcact ggttatcacc 1440

ctttactgca aacggggcag aaagaaactc ctgtatatat tcaaacaacc atttatgaga 1500

ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1560

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1620

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1680

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1740

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1800

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1860

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1914

<210> 238
<211> 1944
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-4C4 CAR (nucleic acid)

<400> 238
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cccgaggtgc agctggtgga gagtgggcca gggttggtga agccctctca gacgcttagt 120

ctgacctgca ctgtatctgg cgcttctatc actaccggcg agttctattg gaattggttc 180

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1860

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1920

atgcaggccc tgcccctcg ctaa 1944

<210> 239
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-5C1 CAR (nucleic acid)

<400> 239
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ccacaaattc agctggtaga gagtggaggc ggcctcgtgc agccgggcgg ctcgctgcgc 120

ctttcctgtg ctgcttccgg cttcacattt tcaaattacc cgatgacctg gctacggcag 180

gccccgggaa agggtctgga gagcgtgtcc gacatcacct ctggaggtga ccgtccctat 240

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gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 240
<211> 1884

<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-5C2 CAR (nucleic acid)

<400> 240
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cctcagatcc agctagtgga gtctggcggg ggtctggtgc agccaggggg cagccttcgc 120

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tacgcggaca gcgtgaaggg ccgcttcacc atttctcgtg acaacgccaa gaacatgctg 300

tacctggaga tgaactcctt aaagaccgag gatacggccg tctactactg tgccacctgg 360

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1800

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1860

atgcaggccc tgcccctcg ctaa 1884

<210> 241
<211> 1914
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-5C3 CAR (nucleic acid)

<400> 241
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cctcagatcc agctcgttga gagcggcgga gggctggtcc agccaggggg ctcgctgcgt 120

ctgtcctgtg ccgcctccgg ctttacgttc agtaactacc ctatgacctg gctccgccag 180

gccccgggca aaggccttga aagcgtgtcc gacatcactt caggtggtga tcggccctat 240

tacgcggaca gcgtgaaggg acgcttcacc atctcccgcg acaacgccaa gaacatgctt 300

tacctggaga tgaactccct aaagaccgag gacaccgccg tctactactg tgccacctgg 360

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tccgtgcagg ccggcgggtc tcttcgcctg tcctgcgggg cttccggtaa cattaattcc 540

cgcaactgca tggggtggtt cagacaggct cccggcaagg agcgcgaggg cgtggcggcg 600

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atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1860

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1914

<210> 242
<211> 1944
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-5C4 CAR (nucleic acid)

<400> 242
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ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1560

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1860

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1920

atgcaggccc tgcccctcg ctaa 1944

<210> 243
<211> 1875
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-6C1 CAR (nucleic acid)

<400> 243
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cctgaagtgc agttggtgga gtctgggggc ggcttagtgc aggctggcgg ttctctccgc 120

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agagaggagt acgatgtttt ggacaagaga cgtggccggg accctgagat ggggggaaag 1680

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ctttaccagg gtctcagtac agccaccaag gacacctacg acgcccttca catgcaggcc 1860

ctgccccctc gctaa 1875

<210> 244
<211> 1905
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-6C2 CAR (nucleic acid)

<400> 244
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gcggcttctg gctcaacgac ctactcccca tcctttgaga gccgcaccag catctctcgc 1080

gacacctccg agaaccagtt ttacctgcaa ctaagctccg tgacgcctga agatacagct 1140

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aaacggggca gaaagaaact cctgtatata ttcaaacaac catttatgag accagtacaa 1500

actactcaag aggaagatgg ctgtagctgc cgatttccag aagaagaaga aggaggatgt 1560

gaactgagag tgaagttcag caggagcgca gacgcccccg cgtaccagca gggccagaac 1620

cagctctata acgagctcaa tctaggacga agagaggagt acgatgtttt ggacaagaga 1680

cgtggccggg accctgagat gggggggaaag ccgagaagga agaaccctca ggaaggcctg 1740

tacaatgaac tgcagaaaga taagatggcg gaggcctaca gtgagattgg gatgaaaggc 1800

gagcgccgga ggggcaaggg gcacgatggc ctttaccagg gtctcagtac agccaccaag 1860

gacacctacg acgcccttca catgcaggcc ctgccccctc gctaa 1905

<210> 245
<211> 1935
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-6C3 CAR (nucleic acid)

<400> 245
atggccctcc cggtgactgc gctgctgctg cccctggccc tactgcttca cgccgctagg 60

cccgaggtgc agctggtgga gagtggaggc gggctggtgc aggctggcgg ttcgcttcgt 120

ttatcatgcg cagctagtgg acggaccttt tcatcctaca acatgggctg gttccgccag 180

gcccccggca aggagcgcga gttcgtcgcg gtggtggact ggtctggcgg gtccccctat 240

tacgcggaca gcgtgaaggg ccgtttcacc atctcccgcg acaacggtaa gaacacggtc 300

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gccagcggga acattaattc tcgcaactgc atgggatggt ttagacaggc tcctggaaaa 600

gagagggagg gcgtggctgc tatcggtcaa gtaaccggtc gcagctacta cgtggactcc 660

gttaagggtc gtttcaccat cagcttggac aacgcgaaga acactctgta cctccagatg 720

aacacgctca agccagagga caccgccatg tattactgtg ccgcagcccc tgggtgcctg 780

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ttcaaacaac catttatgag accagtacaa actactcaag aggaagatgg ctgtagctgc 1560

cgatttccag aagaagaaga aggaggatgt gaactgagag tgaagttcag caggagcgca 1620

gacgcccccg cgtaccagca gggccagaac cagctctata acgagctcaa tctaggacga 1680

agagaggagt acgatgtttt ggacaagaga cgtggccggg accctgagat ggggggaaag 1740

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gaggcctaca gtgagattgg gatgaaaggc gagcgccgga ggggcaaggg gcacgatggc 1860

ctttaccagg gtctcagtac agccaccaag gacacctacg acgcccttca catgcaggcc 1920

ctgccccctc gctaa 1935

<210> 246
<211> 1965
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-6C4 CAR (nucleic acid)

<400> 246
atggctttgc cggtgaccgc cctgctcctg cccctggcgc tgcttctgca cgccgctcgt 60

cctgaagtgc agctggtgga gtctgggggg ggcctcgtgc aggctggagg tagcttgcgt 120

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ggctcccaag tacagctggt ggagtctggc ggcggaagcg tccaggccgg aggctcactt 540

cgcctgtcat gtggcgctag cggcaacatt aacagccgca actgcatggg ctggttccgc 600

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cagctctata acgagctcaa tctaggacga agagaggagt acgatgtttt ggacaagaga 1740

cgtggccggg accctgagat gggggggaaag ccgagaagga agaaccctca ggaaggcctg 1800

tacaatgaac tgcagaaaga taagatggcg gaggcctaca gtgagattgg gatgaaaggc 1860

gagcgccgga ggggcaaggg gcacgatggc ctttaccagg gtctcagtac agccaccaag 1920

gacacctacg acgcccttca catgcaggcc ctgcccccctc gctaa 1965

<210> 247
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-7C1 CAR (nucleic acid)

<400> 247
atggccctgc ccgtcactgc gctgctgctg cccctggccc tgctcctgca cgccgctcgt 60

cctcaggtcc agttggtgga gagcggaggc ggcagcgtgc aggccggcgg atcccttcgc 120

ctgagctgtg gtgcatctgg caacattaac tcccgcaact gcatgggctg gttcagacaa 180

gcgccgggga aggagcgcga gggcgtggcg gcaatcggtc aggtgaccgg ccgcagctac 240

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gggttagtgc agccaggcgg ctccctgcgc ctgtcatgcg ccgcctccgg cttcaccttt 540

tcaaattacc caatgacctg gctccgtcag gcccccggca aaggcctgga gtccgtgtcc 600

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ctttactgca aacggggcag aaagaaactc ctgtatatat tcaaacaacc atttatgaga 1440

ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1500

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 248
<211> 1884
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-7C2 CAR (nucleic acid)

<400> 248
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cctcaggtgc agctggtgga gagcggagga ggttctgtgc aggccggcgg ttctctgcgc 120

ctgagttgtg gtgcatcggg caacattaac agccggaact gcatgggatg gttcagacag 180

gcccccggca aggagcgcga gggcgtggct gctatcggtc aggtcaccgg tcgcagctac 240

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tacctccaga tgaatactct gaagcctgaa gatacggcca tgtattactg tgctgcagcc 360

cccgggtgcc tgctgagcgc gcttcgatcc gcggactacc gcaactgggg ccagggcacc 420

caggttaccg tgagctccgg cgggggcggt tctggtggcg gaggctccca aattcagttg 480

gtggagtcgg gcggaggttt ggtgcagccg ggcggttctt tgcgtctgtc atgcgctgcg 540

tctggcttca ccttttcaaa ttatccgatg acctggctcc gccaggcccc tggcaaaggc 600

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tcctccacta gtaccacgac gccagcgccg cgaccaccaa caccggcgcc caccatcgcg 1260

tcgcagcccc tgtccctgcg cccagaggcg tgccggccag cggcgggggg cgcagtgcac 1320

acgagggggc tggacttcgc ctgtgatatc tacatctggg cgcccttggc cgggacttgt 1380

ggggtccttc tcctgtcact ggttatcacc ctttactgca aacggggcag aaagaaactc 1440

ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1500

tgtagctgcc gatttccaga agaagaagaa ggaggatgtg aactgagagt gaagttcagc 1560

aggagcgcag acgcccccgc gtaccagcag ggccagaacc agctctataa cgagctcaat 1620

ctaggacgaa gagaggagta cgatgttttg gacaagagac gtggccggga ccctgagatg 1680

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1800

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1860

atgcaggccc tgcccctcg ctaa 1884

<210> 249
<211> 1914
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-7C3 CAR (nucleic acid)

<400> 249
atggcgctcc cggtgaccgc tttgctgctg cccctggcgc tgctgcttca cgccgctcgc 60

cctcaggtgc agttggtgga gagcggtggc ggctccgtgc aggccggcgg ctccttacgt 120

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tacgtggaca gcgtcaaggg tcgcttcacc atctcacttg ataacgcgaa aaacactctt 300

tacctgcaga tgaatacgct caagcccgag gacacggcca tgtattactg tgccgctgct 360

ccggggtgcc tgctctccgc cctgcgctcc gccgactaca ggaactgggg ccagggcacc 420

caggtcacag tctcttctgg tggtggcggg tccggcggcg ggggttcggg cggcggtggc 480

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tacatctggg cgcccttggc cgggacttgt ggggtccttc tcctgtcact ggttatcacc 1440

ctttactgca aacggggcag aaagaaactc ctgtatatat tcaaacaacc atttatgaga 1500

ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1560

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1620

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gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1740

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1800

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1860

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1914

<210> 250
<211> 1944
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-7C4 CAR (nucleic acid)

<400> 250
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cctcaggtcc aactggtgga gagcggcggc ggttccgtgc aggccggcgg ctcgttgcgt 120

ctgagctgtg gggcttccgg caacattaac tcccgcaact gcatggggtg gttccgccag 180

gctcccggca aggagcgcga gggcgtcgca gctatcggtc aggtcactgg tcggagctac 240

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cccgggtgcc tgctgtccgc tctgcgctcg gccgattacc ggaattgggg ccagggcacc 420

caggtcaccg tgagctcggg tggcggaggc tccgggggtg gaggctccgg cggaggggc 480

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ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1560

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aggagcgcag acgcccccgc gtaccagcag ggccagaacc agctctataa cgagctcaat 1680

ctaggacgaa gagaggagta cgatgttttg gacaagagac gtggccggga ccctgagatg 1740

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1860

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1920

atgcaggccc tgcccctcg ctaa 1944

<210> 251
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-8C1 CAR (nucleic acid)

<400> 251
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cctcaggtgc agttggtgga gagcgggggt ggctccgtgc aggcgggtgg atctttgaga 120

ctctcttgtg gcgcctcggg caacattaac tcccgtaact gcatggggtg gttccgccag 180

gccccgggca aggagcgcga gggcgtggct gccatcggtc aggtcaccgg tcgcagctac 240

tacgtcgatt ctgtaaaggg ccgcttcacc atctctctgg acaacgctaa gaacacgctt 300

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caggtcacag tctcttctgg gggaggcggg tcggaggtgc agctggtcga gagcgggccg 480

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ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1500

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gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 252
<211> 1884
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-8C2 CAR (nucleic acid)

<400> 252
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cctcaggtgc agttggtgga gtccggcggc gggtccgtac aagcaggggg atctttgcgt 120

ctgtcttgtg gcgccagcgg caacattaac tcgcgcaact gcatggggtg gttcaggcag 180

gccccgggca aggagcgaga gggcgtggct gccatcggtc aggtcaccgg tcgcagctac 240

tacgtggatt ctgtcaaggg ccgctttacc atttctctgg ataacgcgaa gaacacgctg 300

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1800

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1860

atgcaggccc tgcccctcg ctaa 1884

<210> 253
<211> 1914
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-8C3 CAR (nucleic acid)

<400> 253
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cctcaggtgc agctggtcga gagcggtgga ggctcagtgc aggcaggcgg cagcttgcgt 120

ttgtcctgtg gcgcatctgg caacattaac tcccgcaact gcatgggatg gttcagacag 180

gccccgggaa aggagcgcga gggcgtcgcc gctatcggtc aagtcactgg ccgtagctac 240

tacgtggatt ctgtgaaggg ccgcttcaca atctctctgg ataacgcgaa gaacacactg 300

tacctgcaga tgaacacgct aaagcccgaa gacacggcca tgtattactg tgctgctgct 360

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caggttacag tctcctccgg ggggggtggt tctggagggg gcggttcggg tggcggcggt 480

tccgaggtgc agttggtgga gtcaggaccc ggcctggtaa aaccctcaca gactctttcc 540

ctcacctgca ctgtgagcgg cgcctctatc accacaggcg agttctattg gaactggttc 600

cgccagccgc ctggtaaagg cctggagtgg atgggcgcca tcgccgcctc tggatccacc 660

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cagctagttg agagtggcgg gggactcgtg cagccaggcg gctccctgcg cctgtcgtgt 960

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gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1800

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1860

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1914

<210> 254
<211> 1944
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-8C4 CAR (nucleic acid)

<400> 254
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ctgtcttgcg gggcctcggg caacatcaac agccgcaact gcatggggtg gttcagacag 180

gctcctggta aggagcgcga gggcgtcgca gctatcggtc aagtgaccgg gcgttcctac 240

tacgtggata gtgttaaagg ccgtttcacc atctcgctgg acaacgcgaa aaacacactg 300

tacctgcaga tgaatactct taagcccgag gacacagcca tgtattactg tgctgccgcc 360

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ctgtatatat tcaaacaacc atttatgaga ccagtacaaa ctactcaaga ggaagatggc 1560

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aagatggcgg aggcctacag tgagattggg atgaaaggcg agcgccggag gggcaagggg 1860

cacgatggcc tttaccaggg tctcagtaca gccaccaagg acacctacga cgcccttcac 1920

atgcaggccc tgcccctcg ctaa 1944

<210> 255
<211> 1875
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-9C1 CAR (nucleic acid)

<400> 255
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ctttaccagg gtctcagtac agccaccaag gacacctacg acgcccttca catgcaggcc 1860

ctgccccctc gctaa 1875

<210> 256
<211> 1875
<212> DNA
<213> Artificial Sequence

<220>
<223> AIO-10C1 CAR (nucleic acid)

<400> 256
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ctgccccctc gctaa 1875

<210> 257
<211> 1875
<212> DNA
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<220>
<223> AIO-11C1 CAR (nucleic acid)

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<210> 258
<211> 1875
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<220>
<223> AIO-12C1 CAR (nucleic acid)

<400> 258
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cgatttccag aagaagaaga aggaggatgt gaactgagag tgaagttcag caggagcgca 1560

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ctgccccctc gctaa 1875

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gcgccgggca aggagaggga gggcgtggcc gccatcggcc aggtgaccgg acgcagctac 240

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gacgcccccg cgtaccagca gggccagaac cagctctata acgagctcaa tctaggacga 1620

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ctttaccagg gtctcagtac agccaccaag gacacctacg acgcccttca catgcaggcc 1860

ctgccccctc gctaa 1875

<210> 260
<211> 1854
<212> DNA
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<220>
<223> huAIO-100 CAR (nucleic acid)

<400> 260
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ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

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atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 261
<211> 1854
<212> DNA
<213> Artificial Sequence

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<223> huAIO-133 CAR (nucleic acid)

<400> 261
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gcccctggca aaggcaggga gggcgtggcg gcaatcggtc aggtcactgg ccgcagctat 240

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tacctgcaga tgaactccct acgcgcggaa gacaccgcag tgtactactg tgctgcagcc 360

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atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 262
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-167 CAR (nucleic acid)

<400> 262
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atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 263
<211> 1875
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-180 CAR (nucleic acid)

<400> 263
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ctgccccctc gctaa 1875

<210> 264
<211> 1875
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-203 CAR (nucleic acid)

<400> 264
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ctatcctgtg ctgcttccgg caacattaat tcccgcaact gcatgggctg gttccgccag 180

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ctttaccagg gtctcagtac agccaccaag gacacctacg acgcccttca catgcaggcc 1860

ctgccccctc gctaa 1875

<210> 265
<211> 1875
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-213 CAR (nucleic acid)

<400> 265
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<212> DNA
<213> Artificial Sequence

<220>
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ctgccccctc gctaa 1875

<210> 267
<211> 1875

<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-227 CAR (nucleic acid)

<400> 267
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<223> huAIO-230 CAR (nucleic acid)

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ctttaccagg gtctcagtac agccaccaag gacacctacg acgcccttca catgcaggcc 1860

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<211> 1875
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-240 CAR (nucleic acid)

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<210> 270
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<223> huAIO-243 CAR (nucleic acid)

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<211> 1854
<212> DNA
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<223> huAIO-267 CAR (nucleic acid)

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gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

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<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-300 CAR (nucleic acid)

<400> 272
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ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1500

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 273
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-333 CAR (nucleic acid)

<400> 273
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ctgtcatgcg ccgcttccgg caacattaat tcccgcaact gcatggggtg gttcagacag 180

gcccctggca aaggcaggga gggcgtggct gccatcggtc aggtcaccgg ccgcagctac 240

tacgtggatt ctgtgaaggg ccgcttcacc atctctttgg acaactccaa gaacacgctg 300

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gggctggtta agccctctca gaccctgagc ctcacctgca ctgtctctgg tgcttctatc 540

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gcggacaccg ccgtgtatta ctgcgggcgc tcgtttggtg tggcggccgt cacgaccggc 780

cagaaccgcg gacagggcac cctggtgacc gtcagctcgg ggggcggtgg ttctcaaatt 840

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aagggtctgg agtccgtgtc cgacatcacc tccggcggtg ataggcccta ttacgcggac 1020

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tgccggccag cggcgggggg cgcagtgcac acgaggggc tggacttcgc ctgtgatatc 1320

tacatctggg cgcccttggc cgggacttgt ggggtccttc tcctgtcact ggttatcacc 1380

ctttactgca aacggggcag aaagaaactc ctgtatatat tcaaacaacc atttatgaga 1440

ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1500

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

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atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 274
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-433 CAR (nucleic acid)

<400> 274
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ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1500

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 275
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-467 CAR (nucleic acid)

<400> 275
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tccttcggcg tcgcagccgt caccacagga cagaaccgcg gccaaggaac tctggtgacc 420

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cagcctggcg gttccctgcg tctatcatgc gccgccagcg gcaacattaa cagccgcaac 540

tgcatggggt ggttccgcca ggccccgggg aaggggaggg agggcgtggc tgccattgga 600

caggtcaccg gcagaagcta ctacgtggac agcgtcaagg gccgcttcac catctctctg 660

gacaactcca agaacacgct ttacctgcag atgaactcct tacgtgcgga agataccgcc 720

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tacatctggg cgcccttggc cgggacttgt ggggtccttc tcctgtcact ggttatcacc 1380

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gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 276
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-500 CAR (nucleic acid)

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cagccaggcg gctccctccg cctgtcctgt gcagcttctg gcaacattaa ctcccgcaac 540

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caggtcactg gaagaagcta ctacgtggat tctgtgaagg gccgtttcac catctcactg 660

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gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

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<211> 1854
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<213> Artificial Sequence

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<223> huAIO-600 CAR (nucleic acid)

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gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

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atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 278
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-633 CAR (nucleic acid)

<400> 278
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gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

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atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 279
<211> 1854
<212> DNA
<213> Artificial Sequence

<220>
<223> huAIO-667 CAR (nucleic acid)

<400> 279
atggccctgc ctgtgactgc gctcctgctg cccctggccc tgcttttgca cgccgctcgt 60

cctcaggtgc agttgcagga gagcgggccc gggctggtaa agcccagcca gactctgtcc 120

ttgacctgca ctgtatctgg tgcttccatc acgaccggcg agttctattg gaactggttc 180

cgccagccac ccggcaaggg ccttgaatgg atgggcgcca tcgcggcttc tggctcgacc 240

acctactccc cctcttttga gagccgcacc agcatctccc gggacacctc caaaaaccag 300

ttctcgctga agctgagttc cgtgacggcc gcggacactg ccgtgtacta ctgcgggcgc 360

tccttcggcg tcgcagccgt caccacagga cagaaccgcg gacagggaac tctggttacg 420

gtaagctcgg gaggcggtgg ctcccaggtc cagctggtgg agagcggagg tggtgtggtg 480

cagccgggac gcagccttcg cctttcgtgt gctgcgtccg gcaacattaa ttcccgcaac 540

tgcatgggct ggttcagaca ggccccagga aaaggcaggg agggcgtggc tgccatcggt 600

caggtcactg gccggagcta ctacgtggat tctgtgaagg gtagattcac catctctctg 660

gacaactcca agaacacgct ttacctgcag atgaactccc tgcgcgccga agataccgcc 720

gtgtactact gtgcggcggc ccctgggtgc ctgctctcgg cgctgcgctc tgcggactac 780

aggaactggg gccaggggac ccttgtcacc gtctcttctg gcggaggcgg ctcccaaatt 840

cagctggtgg agagtggggg cggcctagtg cagccgggcg gctccctgcg cctgtcatgc 900

gccgcttcgg gcttcacgtt ctcgaactac ccgatgacct ggctccgcca ggccccgggc 960

aaaggtctgg agtccgtgtc cgacatcacc agtgggggtg ataggcccta ttacgcggac 1020

agtgtcaagg gccgcttcac catctcgcgc gacaacgcca agaatatgct gtacctccag 1080

atgaactcct tacgggccga ggacacagcg gtgtactact gtgccacctg ggacaggacc 1140

ctgaccggcc agggcaccct ggtgaccgtg agctccacta gtaccacgac gccagcgccg 1200

cgaccaccaa caccggcgcc caccatcgcg tcgcagcccc tgtccctgcg cccagaggcg 1260

tgccggccag cggcgggggg cgcagtgcac acgaggggc tggacttcgc ctgtgatatc 1320

tacatctggg cgcccttggc cgggacttgt ggggtccttc tcctgtcact ggttatcacc 1380

ctttactgca aacggggcag aaagaaactc ctgtatatat tcaaacaacc atttatgaga 1440

ccagtacaaa ctactcaaga ggaagatggc tgtagctgcc gatttccaga agaagaagaa 1500

ggaggatgtg aactgagagt gaagttcagc aggagcgcag acgccccgc gtaccagcag 1560

ggccagaacc agctctataa cgagctcaat ctaggacgaa gagaggagta cgatgttttg 1620

gacaagagac gtggccggga ccctgagatg gggggaaagc cgagaaggaa gaaccctcag 1680

gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg 1740

atgaaaggcg agcgccggag gggcaagggg cacgatggcc tttaccaggg tctcagtaca 1800

gccaccaagg acacctacga cgcccttcac atgcaggccc tgcccctcg ctaa 1854

<210> 280
<211> 242
<212> PRT
<213> Artificial Sequence

<220>
<223> FMC63 scFv

<400> 280

Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Lys Tyr
20 25 30

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

Tyr His Thr Ser Arg Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln
65 70 75 80

```
Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Tyr
                85                  90                  95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Thr Gly Gly Gly Gly Ser
            100                 105                 110

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Lys Leu Gln Glu
        115                 120                 125

Ser Gly Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys
    130                 135                 140

Thr Val Ser Gly Val Ser Leu Pro Asp Tyr Gly Val Ser Trp Ile Arg
145                 150                 155                 160

Gln Pro Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser
                165                 170                 175

Glu Thr Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile
            180                 185                 190

Lys Asp Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln
        195                 200                 205

Thr Asp Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly
    210                 215                 220

Gly Ser Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val
225                 230                 235                 240

Ser Ser
```

<210> 281
<211> 243
<212> PRT
<213> Artificial Sequence

<220>
<223> Leu16 scFv

<400> 281

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

Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Val Asn Tyr Met
            20                  25                  30

Asp Trp Tyr Gln Lys Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr
        35                  40                  45

Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser
    50                  55                  60

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

Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Ser Phe Asn Pro Pro Thr
                85                  90                  95

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly Gly Ser Gly
            100                 105                 110

Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Gln Gln Ser
        115                 120                 125

Gly Ala Glu Leu Val Lys Pro Gly Ala Ser Val Lys Met Ser Cys Lys
    130                 135                 140

Ala Ser Gly Tyr Thr Phe Thr Ser Tyr Asn Met His Trp Val Lys Gln
145                 150                 155                 160

Thr Pro Gly Gln Gly Leu Glu Trp Ile Gly Ala Ile Tyr Pro Gly Asn
                165                 170                 175

Gly Asp Thr Ser Tyr Asn Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr
            180                 185                 190

Ala Asp Lys Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr
        195                 200                 205

Ser Glu Asp Ser Ala Asp Tyr Tyr Cys Ala Arg Ser Asn Tyr Tyr Gly
    210                 215                 220
```

Ser Ser Tyr Trp Phe Phe Asp Val Trp Gly Ala Gly Thr Thr Val Thr
225 230 235 240

Val Ser Ser

<210> 282
<211> 246
<212> PRT
<213> Artificial Sequence

<220>
<223> m971 scFv

<400> 282

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

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

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

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Val Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu Glu Asp Ala Phe Asp
100 105 110

Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly Gly
115 120 125

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr
130 135 140

```
Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile
145                 150                 155                 160


Thr Cys Arg Ala Ser Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln
                165                 170                 175


Gln Arg Pro Gly Lys Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser
            180                 185                 190


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


Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr
    210                 215                 220


Tyr Tyr Cys Gln Gln Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly
225                 230                 235                 240


Thr Lys Leu Glu Ile Lys
                245


<210>  283
<211>  8
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  CDR1 (Kabat) of VHH-623

<400>  283

Gly Arg Thr Phe Ser Asn Tyr Ala
1               5


<210>  284
<211>  17
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  CDR2 (Kabat) of VHH-623

<400>  284
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Ala Ile Ser Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ala Val Arg
1 5 10 15

Gly

<210> 285
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 (Kabat) of VHH-623

<400> 285

Gly Ile Tyr Tyr Gly Ser Asn Trp Ser Ser Glu Asn
1 5 10

<210> 286
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (IMGT) of VHH-623

<400> 286

Gly Arg Thr Phe Ser Asn Tyr Ala Ala Gly
1 5 10

<210> 287
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (IMGT) of VHH-623

<400> 287

Ile Ser Trp Ser Gly Gly Ser Pro
1 5

<210> 288
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 (IMGT) of VHH-623

<400> 288

Ala Ala Gly Ile Tyr Tyr Gly Ser Asn Trp Ser Ser Glu Asn
1   5   10

<210> 289
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (Kabat) of VHH-640

<400> 289

Gly Tyr Thr Trp Gln Thr Tyr Cys Met Ala
1   5   10

<210> 290
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (Kabat) of VHH-640

<400> 290

Val Ala Thr Gly Ser Arg Thr Thr Ser Tyr Ala Asp Ser Val Lys Gly
1   5   10   15

<210> 291
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 (Kabat) of VHH-640

<400> 291

Asp Pro Arg Arg Tyr Gly Ser Cys Pro Leu Ser Ala Ala Asn Phe Asn
1   5   10   15

Asn

<210> 292
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (IMGT) of VHH-640

<400> 292

Gly Tyr Thr Trp Gln Thr Tyr Cys
1 5

<210> 293
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (IMGT) of VHH-640

<400> 293

Val Ala Thr Gly Ser Arg Thr Thr
1 5

<210> 294
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 (IMGT) of VHH-640

<400> 294

Ala Ala Asp Pro Arg Arg Tyr Gly Ser Cys Pro Leu Ser Ala Ala Asn
1 5 10 15

Phe Asn Asn

<210> 295
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> CDR1 (Kabat) of VHH-657

<400> 295

Ala Asn Ile Arg Val Phe Tyr Leu Met Gly
1 5 10

<210> 296
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (Kabat) of VHH-657

<400> 296

Arg Val Asn Ala Asp Gly Ile Thr Asn His Ala Ala Ser Val Lys Gly
1 5 10 15

<210> 297
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 (Kabat) of VHH-657

<400> 297

Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr
1 5 10

<210> 298
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (IMGT) of VHH-657

<400> 298

Ala Asn Ile Arg Val Phe Tyr Leu
1 5

<210> 299
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 (IMGT) of VHH-657

<400> 299

Val Asn Ala Asp Gly Ile Thr
1   5

<210> 300
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 (IMGT) of VHH-657

<400> 300

Ala Thr Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr
1   5   10

<210> 301
<211> 121
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-623 (amino acid)

<400> 301

Gln Val Lys Leu Glu Glu Ser Gly Gly Gly Leu Val Gln Ala Gly Gly
1   5   10   15

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

Ala Ala Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Phe Val
        35   40   45

Ala Ala Ile Ser Trp Ser Gly Gly Ser Pro Tyr Tyr Ala Asp Ala Val
    50   55   60

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

```
Leu Gln Met Asn Ser Leu Lys Pro Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95


Ala Ala Gly Ile Tyr Tyr Gly Ser Asn Trp Ser Ser Glu Asn Trp Gly
            100                 105                 110


Gln Gly Thr Gln Val Thr Val Ser Ser
        115                 120


<210>  302
<211>  125
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  VHH-640 (amino acid)

<400>  302

Gln Val Lys Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1               5                   10                  15


Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Tyr Thr Trp Gln Thr Tyr
            20                  25                  30


Cys Met Ala Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val
        35                  40                  45


Ala Val Ala Thr Gly Ser Arg Thr Thr Ser Tyr Ala Asp Ser Val Lys
    50                  55                  60


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


Gln Met Ser Ser Leu Glu Pro Glu Asp Thr Ala Met Tyr Tyr Cys Ala
                85                  90                  95


Ala Asp Pro Arg Arg Tyr Gly Ser Cys Pro Leu Ser Ala Ala Asn Phe
            100                 105                 110


Asn Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
        115                 120                 125
```

<210> 303
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-657 (amino acid)

<400> 303

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Ala Gln Ala Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Gln Ala Ser Ala Asn Ile Arg Val Phe Tyr
20 25 30

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

Ala Arg Val Asn Ala Asp Gly Ile Thr Asn His Ala Ala Ser Val Lys
50 55 60

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

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

Thr Gly Arg Thr Trp Asn Ser Gly Phe Glu Tyr Trp Gly Gln Gly Thr
100 105 110

Gln Val Thr Val Ser Ser
115

<210> 304
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-623 (nucleic acid)

<400> 304
caggtaaagc tggaggagag cggaggtggt ctggtgcaag ccggcggctc cctccgtctt 60

tcatgcgccg cttccggacg aacattttca aattatgcgg ctgggtggtt ccgccaggcc 120

ccgggcaagg agcgcgagtt cgtcgcagcc attagctggt ctggtggctc cccctattac 180

gcggacgccg tgcgcgggcg cttcaccatc tctcgggaca acgcgaaaaa cacggtgtac 240

ctgcagatga actccctgaa gccagaagat accgccgttt actactgtgc tgcaggcatc 300

tactacggca gcaactggtc ttcggagaac tggggccagg gcacccaggt caccgtgtcg 360

tcc 363

<210> 305
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-640 (nucleic acid)

<400> 305
caggtgaagc tggtggagag cggaggggt tccgtgcagg ccggcggatc gctgcggttg 60

tcctgtgccg cttctggcta cacctggcaa acgtactgca tggcttggtt ccgccaggct 120

cccgggaagg agagggaggg cgtagctgtg gcgactggtt cccgcaccac aagctacgcg 180

gacagtgtta aaggccgttt taccatctcc aaggactatg ccaagaatac tctgtacctg 240

cagatgtctt ctctggagcc tgaagatacc gccatgtatt actgtgctgc ggacccgcgc 300

cgctacggct catgcccact cagcgcagcc aacttcaaca actggggcca gggcacccag 360

gtcaccgtgt cctcg 375

<210> 306
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-657 (nucleic acid)

<400> 306
caggtgcagc tggtggagag cggaggggc tccgctcagg ccggaggctc gctgcgccta 60

tcatgccagg cctccgccaa cattcgagtg ttctacttga tgggctggtt ccgccaggcg 120

ccggggaagg agagggagga ggtggctcgc gtcaacgcgg acggcatcac caaccatgca 180

gcctccgtaa agggccgctt caccatctct gaggacagtc caaaaaacac tctttatctg 240

cagatggatt ctctgaagcc tgaagacacc gccgtgtact actgtgccac gggtcggacc 300

tggaactccg gttttgagta ctggggccag ggcacccagg tcactgtgag ctcg 354

<210> 307
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR2 of VHH-131 (Kabat)

<400> 307

Gly Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 308
<211> 125
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-131 (amino acid)

<400> 308

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Ser Val Gln Ala Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Gly Ala Ser Gly Asn Ile Asn Ser Arg Asn
20 25 30

Cys Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Gly Val
35 40 45

Ala Gly Ile Gly Gln Val Thr Gly Arg Ser Tyr Tyr Ala Asp Ser Val
50 55 60

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

Leu Gln Met Asn Thr Leu Lys Pro Glu Asp Thr Ala Met Tyr Tyr Cys
85 90 95

Ala Ala Ala Pro Gly Cys Leu Leu Ser Ala Leu Arg Ser Ala Asp Tyr
100 105 110

Arg Asn Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
115 120 125

<210> 309
<211> 375
<212> DNA
<213> Artificial Sequence

<220>
<223> VHH-131 (nucleic acid)

<400> 309
caggtgcagc tggtggagag cggaggaggc tccgtgcagg ccggcggctc cctgcgcctg 60

tcatgcgggg cttccggcaa cattaactcc cgcaactgca tgggctggtt ccgccaggcc 120

cccggcaagg agcgcgaggg cgtggctggc atcggtcagg tcaccggccg cagctactac 180

gcggacagcg tgaagggccg cttcaccatc tctctggaca acgccaagaa catgctgtac 240

ctgcagatga acacgctgaa gcctgaagac accgccatgt attactgtgc cgcggctccc 300

gggtgcctgc tgagcgcgct ccgtagtgcg gactacagga attggggcca gggcacccag 360

gtcaccgtgt cgtcc 375

<210> 310
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (Kabat with 5aa) of VHH-273,VHH-283, huVHH-253, huVHH-256

<400> 310

Ser Tyr Asn Met Gly
1 5

<210> 311
<211> 5
<212> PRT
<213> Artificial Sequence

<220>

<223> CDR1 (Kabat with 5aa) of VHH-313 and huVHH-260

<400> 311

Ser Tyr Ser Met Gly
1 5

<210> 312
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (Kabat with 5aa) of VHH-440, VHH-653, VHH-466, huVHH-836, huVHH-840, huVHH-843, huVHH-846 and VHH-657

<400> 312

Phe Tyr Leu Met Gly
1 5

<210> 313
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (Kabat with 5aa) of VHH-496, huVHH-746, and huVHH-750, huVHH-753

<400> 313

Asn Tyr Pro Met Thr
1 5

<210> 314
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (Kabat with 5aa) of VHH-623

<400> 314

Asn Tyr Ala Ala Gly
1 5

<210> 315
<211> 5

<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 (Kabat with 5aa) of VHH-640

<400> 315

Thr Tyr Cys Met Ala
1   5

<210> 316
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 of VHH-083 & VHH-131 (Kabat with 5aa)

<400> 316

Arg Asn Cys Met Gly
1   5

<210> 317
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR1 of VHH-111 (Kabat with 5aa)

<400> 317

Asn Lys Trp Met Gly
1   5

<210> 318
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-18 CDR1 (Kabat with 5aa)

<400> 318

Ser Val Ser Met Gly
1   5

<210> 319
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-66 CDR1 (Kabat with 31-35)

<400> 319

Thr Gly Glu Phe Tyr Trp Asn
1   5

<210> 320
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-87 CDR1 (Kabat with 5aa)

<400> 320

Thr Tyr Cys Met Gly
1   5

<210> 321
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-90 CDR1 (Kabat with 5aa)

<400> 321

Arg Tyr Cys Met Gly
1   5

<210> 322
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-102 CDR1 (Kabat with 5aa)

<400> 322

Gly Tyr Cys Leu Ala
1   5

<210> 323
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> VHH-105 CDR1 (Kabat with 31-35)

<400> 323

Val Ser Ile Ala
1