SEQUENCE LISTING

<110> NEOVACS
INSERM (Institut National de la Santé et de la Recherche Médicale)
INSTITUT PASTEUR
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Serra Vincent

<120> IMMUNOGENIC PRODUCT COMPRISING IL-4 AND/OR IL-13 FOR TREATING DISORDERS ASSOCIATED WITH ABERRANT IL-4 AND/OR IL-13 EXPRESSION OR ACTIVITY

<130> CV-1058/PCT/2

<160> 8

<170> BiSSAP 1.3.6

<210> 1
<211> 535
<212> PRT
<213> Artificial Sequence

<220>
<223> CRM197

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

```
Val Glu Leu Glu Ile Asn Phe Glu Thr Arg Gly Lys Arg Gly Gln Asp
                165                 170                 175
Ala Met Tyr Glu Tyr Met Ala Gln Ala Cys Ala Gly Asn Arg Val Arg
            180                 185                 190
Arg Ser Val Gly Ser Ser Leu Ser Cys Ile Asn Leu Asp Trp Asp Val
        195                 200                 205
Ile Arg Asp Lys Thr Lys Thr Lys Ile Glu Ser Leu Lys Glu His Gly
    210                 215                 220
Pro Ile Lys Asn Lys Met Ser Glu Ser Pro Asn Lys Thr Val Ser Glu
225                 230                 235                 240
Glu Lys Ala Lys Gln Tyr Leu Glu Glu Phe His Gln Thr Ala Leu Glu
                245                 250                 255
His Pro Glu Leu Ser Glu Leu Lys Thr Val Thr Gly Thr Asn Pro Val
            260                 265                 270
Phe Ala Gly Ala Asn Tyr Ala Ala Trp Ala Val Asn Val Ala Gln Val
        275                 280                 285
Ile Asp Ser Glu Thr Ala Asp Asn Leu Glu Lys Thr Thr Ala Ala Leu
    290                 295                 300
Ser Ile Leu Pro Gly Ile Gly Ser Val Met Gly Ile Ala Asp Gly Ala
305                 310                 315                 320
Val His His Asn Thr Glu Glu Ile Val Ala Gln Ser Ile Ala Leu Ser
                325                 330                 335
Ser Leu Met Val Ala Gln Ala Ile Pro Leu Val Gly Glu Leu Val Asp
            340                 345                 350
Ile Gly Phe Ala Ala Tyr Asn Phe Val Glu Ser Ile Ile Asn Leu Phe
        355                 360                 365
Gln Val Val His Asn Ser Tyr Asn Arg Pro Ala Tyr Ser Pro Gly His
    370                 375                 380
Lys Thr Gln Pro Phe Leu His Asp Gly Tyr Ala Val Ser Trp Asn Thr
385                 390                 395                 400
Val Glu Asp Ser Ile Ile Arg Thr Gly Phe Gln Gly Glu Ser Gly His
                405                 410                 415
Asp Ile Lys Ile Thr Ala Glu Asn Thr Pro Leu Pro Ile Ala Gly Val
            420                 425                 430
Leu Leu Pro Thr Ile Pro Gly Lys Leu Asp Val Asn Lys Ser Lys Thr
        435                 440                 445
His Ile Ser Val Asn Gly Arg Lys Ile Arg Met Arg Cys Arg Ala Ile
    450                 455                 460
Asp Gly Asp Val Thr Phe Cys Arg Pro Lys Ser Pro Val Tyr Val Gly
465                 470                 475                 480
Asn Gly Val His Ala Asn Leu His Val Ala Phe His Arg Ser Ser Ser
                485                 490                 495
Glu Lys Ile His Ser Asn Glu Ile Ser Ser Asp Ser Ile Gly Val Leu
            500                 505                 510
Gly Tyr Gln Lys Thr Val Asp His Thr Lys Val Asn Ser Lys Leu Ser
        515                 520                 525
Leu Phe Phe Glu Ile Lys Ser
    530                 535

<210> 2
<211> 129
<212> PRT
<213> Homo sapiens
```

<220>
<223> Human IL-4

<400> 2
His Lys Cys Asp Ile Thr Leu Gln Glu Ile Ile Lys Thr Leu Asn Ser
1   5   10   15
Leu Thr Glu Gln Lys Thr Leu Cys Thr Glu Leu Thr Val Thr Asp Ile
            20   25   30
Phe Ala Ala Ser Lys Asn Thr Thr Glu Lys Glu Thr Phe Cys Arg Ala
        35   40   45
Ala Thr Val Leu Arg Gln Phe Tyr Ser His His Glu Lys Asp Thr Arg
    50   55   60
Cys Leu Gly Ala Thr Ala Gln Gln Phe His Arg His Lys Gln Leu Ile
65   70   75   80
Arg Phe Leu Lys Arg Leu Asp Arg Asn Leu Trp Gly Leu Ala Gly Leu
                85   90   95
Asn Ser Cys Pro Val Lys Glu Ala Asn Gln Ser Thr Leu Glu Asn Phe
            100   105   110
Leu Glu Arg Leu Lys Thr Ile Met Arg Glu Lys Tyr Ser Lys Cys Ser
        115   120   125
Ser

<210> 3
<211> 22
<212> PRT
<213> Homo sapiens

<220>
<223> Fragment of Human IL-4

<400> 3
Ala Gln Gln Phe His Arg His Lys Gln Leu Ile Arg Phe Leu Lys Arg
1   5   10   15
Leu Asp Arg Asn Leu Trp
            20

<210> 4
<211> 120
<212> PRT
<213> Mus musculus

<220>
<223> Murine IL-4

<400> 4
His Ile His Gly Cys Asp Lys Asn His Leu Arg Glu Ile Ile Gly Ile
1   5   10   15
Leu Asn Glu Val Thr Gly Glu Gly Thr Pro Cys Thr Glu Met Asp Val
            20   25   30
Pro Asn Val Leu Thr Ala Thr Lys Asn Thr Thr Glu Ser Glu Leu Val

```
        35                  40                  45
Cys Arg Ala Ser Lys Val Leu Arg Ile Phe Tyr Leu Lys His Gly Lys
    50                  55                  60
Thr Pro Cys Leu Lys Lys Asn Ser Ser Val Leu Met Glu Leu Gln Arg
65                  70                  75                  80
Leu Phe Arg Ala Phe Arg Cys Leu Asp Ser Ser Ile Ser Cys Thr Met
                85                  90                  95
Asn Glu Ser Lys Ser Thr Ser Leu Lys Asp Phe Leu Glu Ser Leu Lys
            100                 105                 110
Ser Ile Met Gln Met Asp Tyr Ser
        115                 120
```

<210> 5
<211> 108
<212> PRT
<213> Canis

<220>
<223> Canine IL-4

<400> 5

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

<210> 6
<211> 122
<212> PRT
<213> Homo sapiens

<220>
<223> Human IL-13

<400> 6

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

```
    50                  55                  60
Gly Cys Ser Ala Ile Glu Lys Thr Gln Arg Met Leu Ser Gly Phe Cys
65                  70                  75                  80
Pro His Lys Val Ser Ala Gly Gln Phe Ser Ser Leu His Val Arg Asp
                85                  90                  95
Thr Lys Ile Glu Val Ala Gln Phe Val Lys Asp Leu Leu Leu His Leu
            100                 105                 110
Lys Lys Leu Phe Arg Glu Gly Arg Phe Asn
        115                 120
```

<210> 7
<211> 110
<212> PRT
<213> Mus musculus

<220>
<223> Murine IL-13

<400> 7

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

<210> 8
<211> 113
<212> PRT
<213> Canis

<220>
<223> Canine IL-13

<400> 8

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

```
65                  70                  75                  80
Ser Ser Glu Arg Ser Arg Asp Thr Lys Ile Glu Val Ile Gln Leu Val
                85                  90                  95
Lys Asn Leu Leu Thr Tyr Val Arg Gly Val Tyr Arg His Gly Asn Phe
            100                 105                 110
Arg
```