Sequence listing

<110> Pieris AG

<120> Tear lipocalin muteins binding to IL-4 R alpha

<130> PIE14083PCT

<150> US 61/352 461
<151> 2010-06-08

<160> 20

<170> PatentIn version 3.5

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<213> Artificial

<220>
<223> Mutein S191.4-B24 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 2

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1 5 10 15

Ala Met Thr Val Asp Ser Arg Cys Pro Arg Ala Tyr Tyr Ser Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Phe Thr Ala Gln Arg Ser Gly Arg Trp Gln Glu Tyr Lys Leu Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
85 90 95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145 150

<210> 3
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S351.5-M21 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 3

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Ala Met Thr Val Asp Ser Arg Cys Pro Arg Ala Tyr Tyr Glu Ser Val
            20                  25                  30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
        35                  40                  45

Leu Thr Leu Gln Arg Lys Gly Arg Trp Gln Glu Met Lys Asp Val Leu
    50                  55                  60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65                  70                  75                  80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
                85                  90                  95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
            100                 105                 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
        115                 120                 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
    130                 135                 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145                 150
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<210> 4
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S276.2-K04 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 4

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Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1               5                  10                  15

Ala Met Thr Val Asp Pro Arg Cys Pro Arg Ala Tyr Tyr Ser Ser Val
            20                  25                  30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
        35                  40                  45

Phe Thr Ala Gln Arg Ser Gly Arg Trp Gln Lys Tyr Lys Leu Val Leu
    50                  55                  60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65                  70                  75                  80
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Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
                85                  90                  95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
            100                 105                 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
        115                 120                 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
    130                 135                 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145                 150
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<210> 5
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S308.5-K12 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 5

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Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1               5                   10                  15

Ala Met Thr Val Asp Leu Arg Cys Pro Arg Ala Tyr Tyr Trp Ser Val
            20                  25                  30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
        35                  40                  45

Phe Thr Ala Leu Arg Ile Gly Arg Trp Gln Ser Tyr Lys Leu Val Leu
    50                  55                  60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65                  70                  75                  80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
                85                  90                  95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
            100                 105                 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
        115                 120                 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
    130                 135                 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145                 150
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<210> 6
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S308.5-F08 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 6

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Ser Arg Cys Pro Arg Ala Val Tyr Asn Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Phe Thr Ala Gln Arg Lys Gly Arg Trp Gln Lys Tyr Lys Leu Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
85 90 95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145 150

<210> 7
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S308.5-L4 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 7

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Ser Arg Cys Pro Arg Ala Tyr Tyr Val Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys

35 40 45

Phe Thr Ala Ala Arg Ile Gly Arg Trp Gln Ser Tyr Lys Leu Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
85 90 95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145 150

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

<220>
<223> Mutein S308.5-L20 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 8

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

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

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Phe Thr Ala His Arg Arg Gly Arg Trp Gln Gln Tyr Lys Leu Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
85 90 95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys

115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145 150

<210> 9
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S308.5-N1 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 9

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Tyr Arg Cys Pro Arg Ala Tyr Tyr His Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Phe Thr Ala His Arg Ala Gly Arg Trp Gln Lys Tyr Lys Leu Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
85 90 95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145 150

<210> 10
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S308.3-O10 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 10

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Ala Met Thr Val Asp Lys Arg Cys Pro Arg Ala Tyr Tyr Arg Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

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

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
85 90 95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145 150

<210> 11
<211> 154
<212> PRT
<213> Artificial

<220>
<223> Mutein S308.5-N20 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 11

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Arg Cys Pro Arg Ala His Tyr Gly Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Phe Thr Ala Met Arg Leu Gly Arg Trp Gln Lys Tyr Lys Leu Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Ser Gly Gly Arg His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe His
85 90 95

Ser Glu Gly Leu Cys Pro Gly Gln Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly Ser Ala
145 150

<210> 12
<211> 456
<212> DNA
<213> Artificial

<220>
<223> Nucleotide sequence of Mutein S276.2-K04 of human tear lipocalin with binding affinity for IL-4R alpha

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gaaggggca acctggaagc caagttcacc gcgcagcggt cgggccggtg gcagaagtac 180

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<210> 13
<211> 459
<212> DNA
<213> Artificial

<220>
<223> Nucleotide sequence of Mutein S308.5-F08 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 13

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gaaggggca acctggaagc caagttcacc gctcagcgga agggccggtg gcagaagtac 180

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<210> 14
<211> 456
<212> DNA
<213> Artificial

<220>
<223> Nucleotide sequence of Mutein S308.5-L4 of human tear lipocalin with binding affinity for IL-4R alpha

<400> 14

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gaaggggggca acctggaagc caagttcacc gcggcgcgga ttggccggtg gcagagttac 180

aagttggtcc tggagaaaac tgatgagccg ggaaaataca ctgcctccgg gggcaggcac 240

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<210> 15
<211> 456
<212> DNA
<213> Artificial

<220>
<223> Nucleotide sequence of Mutein S308.5-L20 of human tear lipocalin with binding affinity for IL-4R alpha

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gaaggggggca acctggaagc caagttcacc gcgcatcggc ggggccggtg gcagcagtac 180

aagttggtcc tggagaaaac tgatgagccg ggaaaataca ctgcctccgg gggcaggcac 240

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456

<210> 16
<211> 456
<212> DNA
<213> Artificial

<220>
<223> Nucleotide sequence of Mutein S308.5-N1 of human tear lipocalin with binding affinity for IL-4R alpha

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gaaggggggca acctggaagc caagttcacc gctcatcggg ctggccggtg gcagaagtac 180

aagttggtcc tggagaaaac tgatgagccg ggaaaataca ctgcctccgg gggcaggcac 240

gtggcataca tcatcaggtc gcacgtgaag gaccactaca tctttcactc tgagggcctg 300

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<210> 17
<211> 456
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<220>
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gaaggggggca acctggaagc caagttcacc gctatgcggt tgggccggtg gcagaagtac 180

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<210> 18
<211> 825
<212> PRT
<213> Homo sapiens

<220>
<223> Human IL-4 receptor

<400> 18

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Leu Leu Gln Val Ala Ser Ser Gly Asn Met Lys Val Leu Gln Glu Pro
20 25 30

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Thr Cys Val Ser Asp Tyr Met Ser Ile Ser Thr Cys Glu Trp Lys Met
        35                  40                  45

Asn Gly Pro Thr Asn Cys Ser Thr Glu Leu Arg Leu Leu Tyr Gln Leu
    50                  55                  60

Val Phe Leu Leu Ser Glu Ala His Thr Cys Ile Pro Glu Asn Asn Gly
65                  70                  75                  80

Gly Ala Gly Cys Val Cys His Leu Leu Met Asp Asp Val Val Ser Ala
                85                  90                  95

Asp Asn Tyr Thr Leu Asp Leu Trp Ala Gly Gln Gln Leu Leu Trp Lys
            100                 105                 110

Gly Ser Phe Lys Pro Ser Glu His Val Lys Pro Arg Ala Pro Gly Asn
        115                 120                 125

Leu Thr Val His Thr Asn Val Ser Asp Thr Leu Leu Leu Thr Trp Ser
    130                 135                 140

Asn Pro Tyr Pro Pro Asp Asn Tyr Leu Tyr Asn His Leu Thr Tyr Ala
145                 150                 155                 160

Val Asn Ile Trp Ser Glu Asn Asp Pro Ala Asp Phe Arg Ile Tyr Asn
                165                 170                 175

Val Thr Tyr Leu Glu Pro Ser Leu Arg Ile Ala Ala Ser Thr Leu Lys
            180                 185                 190

Ser Gly Ile Ser Tyr Arg Ala Arg Val Arg Ala Trp Ala Gln Cys Tyr
        195                 200                 205

Asn Thr Thr Trp Ser Glu Trp Ser Pro Ser Thr Lys Trp His Asn Ser
    210                 215                 220

Tyr Arg Glu Pro Phe Glu Gln His Leu Leu Leu Gly Val Ser Val Ser
225                 230                 235                 240

Cys Ile Val Ile Leu Ala Val Cys Leu Leu Cys Tyr Val Ser Ile Thr
                245                 250                 255

Lys Ile Lys Lys Glu Trp Trp Asp Gln Ile Pro Asn Pro Ala Arg Ser
            260                 265                 270

Arg Leu Val Ala Ile Ile Ile Gln Asp Ala Gln Gly Ser Gln Trp Glu
        275                 280                 285

Lys Arg Ser Arg Gly Gln Glu Pro Ala Lys Cys Pro His Trp Lys Asn
    290                 295                 300

Cys Leu Thr Lys Leu Leu Pro Cys Phe Leu Glu His Asn Met Lys Arg
305                 310                 315                 320
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Asp Glu Asp Pro His Lys Ala Ala Lys Glu Met Pro Phe Gln Gly Ser
325 330 335

Gly Lys Ser Ala Trp Cys Pro Val Glu Ile Ser Lys Thr Val Leu Trp
340 345 350

Pro Glu Ser Ile Ser Val Val Arg Cys Val Glu Leu Phe Glu Ala Pro
355 360 365

Val Glu Cys Glu Glu Glu Glu Glu Val Glu Glu Glu Lys Gly Ser Phe
370 375 380

Cys Ala Ser Pro Glu Ser Ser Arg Asp Asp Phe Gln Glu Gly Arg Glu
385 390 395 400

Gly Ile Val Ala Arg Leu Thr Glu Ser Leu Phe Leu Asp Leu Leu Gly
405 410 415

Glu Glu Asn Gly Gly Phe Cys Gln Gln Asp Met Gly Glu Ser Cys Leu
420 425 430

Leu Pro Pro Ser Gly Ser Thr Ser Ala His Met Pro Trp Asp Glu Phe
435 440 445

Pro Ser Ala Gly Pro Lys Glu Ala Pro Pro Trp Gly Lys Glu Gln Pro
450 455 460

Leu His Leu Glu Pro Ser Pro Pro Ala Ser Pro Thr Gln Ser Pro Asp
465 470 475 480

Asn Leu Thr Cys Thr Glu Thr Pro Leu Val Ile Ala Gly Asn Pro Ala
485 490 495

Tyr Arg Ser Phe Ser Asn Ser Leu Ser Gln Ser Pro Cys Pro Arg Glu
500 505 510

Leu Gly Pro Asp Pro Leu Leu Ala Arg His Leu Glu Glu Val Glu Pro
515 520 525

Glu Met Pro Cys Val Pro Gln Leu Ser Glu Pro Thr Thr Val Pro Gln
530 535 540

Pro Glu Pro Glu Thr Trp Glu Gln Ile Leu Arg Arg Asn Val Leu Gln
545 550 555 560

His Gly Ala Ala Ala Ala Pro Val Ser Ala Pro Thr Ser Gly Tyr Gln
565 570 575

Glu Phe Val His Ala Val Glu Gln Gly Gly Thr Gln Ala Ser Ala Val
580 585 590

Val Gly Leu Gly Pro Pro Gly Glu Ala Gly Tyr Lys Ala Phe Ser Ser

595 600 605

Leu Leu Ala Ser Ser Ala Val Ser Pro Glu Lys Cys Gly Phe Gly Ala
610 615 620

Ser Ser Gly Glu Glu Gly Tyr Lys Pro Phe Gln Asp Leu Ile Pro Gly
625 630 635 640

Cys Pro Gly Asp Pro Ala Pro Val Pro Val Pro Leu Phe Thr Phe Gly
645 650 655

Leu Asp Arg Glu Pro Pro Arg Ser Pro Gln Ser Ser His Leu Pro Ser
660 665 670

Ser Ser Pro Glu His Leu Gly Leu Glu Pro Gly Glu Lys Val Glu Asp
675 680 685

Met Pro Lys Pro Pro Leu Pro Gln Glu Gln Ala Thr Asp Pro Leu Val
690 695 700

Asp Ser Leu Gly Ser Gly Ile Val Tyr Ser Ala Leu Thr Cys His Leu
705 710 715 720

Cys Gly His Leu Lys Gln Cys His Gly Gln Glu Asp Gly Gly Gln Thr
725 730 735

Pro Val Met Ala Ser Pro Cys Cys Gly Cys Cys Cys Gly Asp Arg Ser
740 745 750

Ser Pro Pro Thr Thr Pro Leu Arg Ala Pro Asp Pro Ser Pro Gly Gly
755 760 765

Val Pro Leu Glu Ala Ser Leu Cys Pro Ala Ser Leu Ala Pro Ser Gly
770 775 780

Ile Ser Glu Lys Ser Lys Ser Ser Ser Ser Phe His Pro Ala Pro Gly
785 790 795 800

Asn Ala Gln Ser Ser Ser Gln Thr Pro Lys Ile Val Asn Phe Val Ser
805 810 815

Val Gly Pro Thr Tyr Met Arg Val Ser
820 825

<210> 19
<211> 427
<212> PRT
<213> Homo sapiens

<220>
<223> human IL-13 receptor alpha 1

<400> 19

Met Glu Trp Pro Ala Arg Leu Cys Gly Leu Trp Ala Leu Leu Leu Cys
1 5 10 15

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Ala Gly Gly Gly Gly Gly Gly Gly Ala Ala Pro Thr Glu Thr Gln
            20                  25                  30

Pro Pro Val Thr Asn Leu Ser Val Ser Val Glu Asn Leu Cys Thr Val
        35                  40                  45

Ile Trp Thr Trp Asn Pro Pro Glu Gly Ala Ser Ser Asn Cys Ser Leu
    50                  55                  60

Trp Tyr Phe Ser His Phe Gly Asp Lys Gln Asp Lys Lys Ile Ala Pro
65                  70                  75                  80

Glu Thr Arg Arg Ser Ile Glu Val Pro Leu Asn Glu Arg Ile Cys Leu
                85                  90                  95

Gln Val Gly Ser Gln Cys Ser Thr Asn Glu Ser Glu Lys Pro Ser Ile
            100                 105                 110

Leu Val Glu Lys Cys Ile Ser Pro Pro Glu Gly Asp Pro Glu Ser Ala
        115                 120                 125

Val Thr Glu Leu Gln Cys Ile Trp His Asn Leu Ser Tyr Met Lys Cys
    130                 135                 140

Ser Trp Leu Pro Gly Arg Asn Thr Ser Pro Asp Thr Asn Tyr Thr Leu
145                 150                 155                 160

Tyr Tyr Trp His Arg Ser Leu Glu Lys Ile His Gln Cys Glu Asn Ile
                165                 170                 175

Phe Arg Glu Gly Gln Tyr Phe Gly Cys Ser Phe Asp Leu Thr Lys Val
            180                 185                 190

Lys Asp Ser Ser Phe Glu Gln His Ser Val Gln Ile Met Val Lys Asp
        195                 200                 205

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

Arg Val Lys Pro Asp Pro Pro His Ile Lys Asn Leu Ser Phe His Asn
225                 230                 235                 240

Asp Asp Leu Tyr Val Gln Trp Glu Asn Pro Gln Asn Phe Ile Ser Arg
                245                 250                 255

Cys Leu Phe Tyr Glu Val Glu Val Asn Asn Ser Gln Thr Glu Thr His
            260                 265                 270

Asn Val Phe Tyr Val Gln Glu Ala Lys Cys Glu Asn Pro Glu Phe Glu
        275                 280                 285

Arg Asn Val Glu Asn Thr Ser Cys Phe Met Val Pro Gly Val Leu Pro
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290 295 300

Asp Thr Leu Asn Thr Val Arg Ile Arg Val Lys Thr Asn Lys Leu Cys
305 310 315 320

Tyr Glu Asp Asp Lys Leu Trp Ser Asn Trp Ser Gln Glu Met Ser Ile
325 330 335

Gly Lys Lys Arg Asn Ser Thr Leu Tyr Ile Thr Met Leu Leu Ile Val
340 345 350

Pro Val Ile Val Ala Gly Ala Ile Ile Val Leu Leu Leu Tyr Leu Lys
355 360 365

Arg Leu Lys Ile Ile Ile Phe Pro Pro Ile Pro Asp Pro Gly Lys Ile
370 375 380

Phe Lys Glu Met Phe Gly Asp Gln Asn Asp Asp Thr Leu His Trp Lys
385 390 395 400

Lys Tyr Asp Ile Tyr Glu Lys Gln Thr Lys Glu Glu Thr Asp Ser Val
405 410 415

Val Leu Ile Glu Asn Leu Lys Lys Ala Ser Gln
420 425

<210> 20
<211> 176
<212> PRT
<213> Homo sapiens

<220>
<223> human tear lipocalin (Tlc)

<400> 20

Met Lys Pro Leu Leu Leu Ala Val Ser Leu Gly Leu Ile Ala Ala Leu
1 5 10 15

Gln Ala His His Leu Leu Ala Ser Asp Glu Glu Ile Gln Asp Val Ser
20 25 30

Gly Thr Trp Tyr Leu Lys Ala Met Thr Val Asp Arg Glu Phe Pro Glu
35 40 45

Met Asn Leu Glu Ser Val Thr Pro Met Thr Leu Thr Thr Leu Glu Gly
50 55 60

Gly Asn Leu Glu Ala Lys Val Thr Met Leu Ile Ser Gly Arg Cys Gln
65 70 75 80

Glu Val Lys Ala Val Leu Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr
85 90 95

Ala Asp Gly Gly Lys His Val Ala Tyr Ile Ile Arg Ser His Val Lys
100 105 110

```
Asp His Tyr Ile Phe Tyr Cys Glu Gly Glu Leu His Gly Lys Pro Val
        115                 120                 125

Arg Gly Val Lys Leu Val Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala
    130                 135                 140

Leu Glu Asp Phe Glu Lys Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu
145                 150                 155                 160

Ser Ile Leu Ile Pro Arg Gln Ser Glu Thr Cys Ser Pro Gly Ser Asp
                165                 170                 175

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