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<110> Fred Hutchinson Cancer Research Center
Schmitt, Thomas M.
Greenberg, Philip D.

<120> ENHANCED AFFINITY T CELL RECEPTORS AND METHODS FOR MAKING THE SAME

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Ala Gly Pro Pro Pro Cys Ala Cys Arg Thr Phe Phe Arg Val Cys Leu
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Lys His Tyr Gln Ala Ser Val Ser Pro Glu Pro Pro Cys Thr Tyr Gly
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Ser Ala Val Thr Pro Val Leu Gly Val Asp Ser Phe Ser Leu Pro Asp
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Gly Gly Gly Ala Asp Ser Ala Phe Ser Asn Pro Ile Arg Phe Pro Phe
            100                 105                 110
Gly Phe Thr Trp Pro Gly Thr Phe Ser Leu Ile Ile Glu Ala Leu His
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Glu Lys Val Cys Asn Pro Gly Trp Lys Gly Pro Tyr Cys Thr Glu Pro
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Ala Val Thr Pro Val Leu Gly Val Asp Ser Phe Ser Leu Pro Asp Gly
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Ala Gly Ile Asp Pro Ala Phe Ser Asn Pro Ile Arg Phe Pro Phe Gly
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Asp Leu His Ser Ser Gly Arg Thr Asp Leu Arg Tyr Ser Tyr Arg Phe
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Val Cys Asp Glu His Tyr Tyr Gly Glu Gly Cys Ser Val Phe Cys Arg
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Pro Arg Asp Asp Ala Phe Gly His Phe Thr Cys Gly Asp Arg Gly Glu
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Lys Met Cys Asp Pro Gly Trp Lys Gly Gln Tyr Cys Thr Asp Pro Ile
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245 250 255
Ile Arg Tyr Pro Gly Cys Leu His Gly Thr Cys Gln Gln Pro Trp Gln
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gcagtggctg tgcggcagct gcggcttcga cggccggacg acggcagcag ggaagccatg    2040
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aaccagaaga aggagctgga agtggactgt ggcctggaca agtccaactg tggcaaacag    2160
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<210> 8
<211> 685
<212> PRT
<213> Homo sapiens

<400> 8

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            20                  25                  30
Gln Leu Gln Glu Phe Ile Asn Glu Arg Gly Val Leu Ala Ser Gly Arg
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Pro Cys Glu Pro Gly Cys Arg Thr Phe Phe Arg Val Cys Leu Lys His
    50                  55                  60
Phe Gln Ala Val Val Ser Pro Gly Pro Cys Thr Phe Gly Thr Val Ser
65                  70                  75                  80
Thr Pro Val Leu Gly Thr Asn Ser Phe Ala Val Arg Asp Asp Ser Ser
                85                  90                  95
Gly Gly Gly Arg Asn Pro Leu Gln Leu Pro Phe Asn Phe Thr Trp Pro
            100                 105                 110
Gly Thr Phe Ser Leu Ile Ile Glu Ala Trp His Ala Pro Gly Asp Asp
        115                 120                 125
Leu Arg Pro Glu Ala Leu Pro Pro Asp Ala Leu Ile Ser Lys Ile Ala
    130                 135                 140
Ile Gln Gly Ser Leu Ala Val Gly Gln Asn Trp Leu Leu Asp Glu Gln
145                 150                 155                 160
Thr Ser Thr Leu Thr Arg Leu Arg Tyr Ser Tyr Arg Val Ile Cys Ser
                165                 170                 175
Asp Asn Tyr Tyr Gly Asp Asn Cys Ser Arg Leu Cys Lys Lys Arg Asn
            180                 185                 190
Asp His Phe Gly His Tyr Val Cys Gln Pro Asp Gly Asn Leu Ser Cys
        195                 200                 205
Leu Pro Gly Trp Thr Gly Glu Tyr Cys Gln Gln Pro Ile Cys Leu Ser
    210                 215                 220
Gly Cys His Glu Gln Asn Gly Tyr Cys Ser Lys Pro Ala Glu Cys Leu
225                 230                 235                 240
Cys Arg Pro Gly Trp Gln Gly Arg Leu Cys Asn Glu Cys Ile Pro His
                245                 250                 255
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Thr His His Ser Pro Cys Lys Asn Gly Ala Thr Cys Ser Asn Ser Gly
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Gln Arg Ser Tyr Thr Cys Thr Cys Arg Pro Gly Tyr Thr Gly Val Asp
305                 310                 315                 320
Cys Glu Leu Glu Leu Ser Glu Cys Asp Ser Asn Pro Cys Arg Asn Gly
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Gly Ser Cys Lys Asp Gln Glu Asp Gly Tyr His Cys Leu Cys Pro Pro
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Gly Tyr Tyr Gly Leu His Cys Glu His Ser Thr Leu Ser Cys Ala Asp
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Ser Pro Cys Phe Asn Gly Gly Ser Cys Arg Glu Arg Asn Gln Gly Ala
    370                 375                 380
Asn Tyr Ala Cys Glu Cys Pro Pro Asn Phe Thr Gly Ser Asn Cys Glu
385                 390                 395                 400
Lys Lys Val Asp Arg Cys Thr Ser Asn Pro Cys Ala Asn Gly Gly Gln
                405                 410                 415
Cys Leu Asn Arg Gly Pro Ser Arg Met Cys Arg Cys Arg Pro Gly Phe
            420                 425                 430
Thr Gly Thr Tyr Cys Glu Leu His Val Ser Asp Cys Ala Arg Asn Pro
        435                 440                 445
Cys Ala His Gly Gly Thr Cys His Asp Leu Glu Asn Gly Leu Met Cys
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Thr Cys Pro Ala Gly Phe Ser Gly Arg Arg Cys Glu Val Arg Thr Ser
465                 470                 475                 480
Ile Asp Ala Cys Ala Ser Ser Pro Cys Phe Asn Arg Ala Thr Cys Tyr
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Thr Asp Leu Ser Thr Asp Thr Phe Val Cys Asn Cys Pro Tyr Gly Phe
            500                 505                 510
Val Gly Ser Arg Cys Glu Phe Pro Val Gly Leu Pro Pro Ser Phe Pro
        515                 520                 525
Trp Val Ala Val Ser Leu Gly Val Gly Leu Ala Val Leu Leu Val Leu
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Asp Asp Gly Ser Arg Glu Ala Met Asn Asn Leu Ser Asp Phe Gln Lys
                565                 570                 575
Asp Asn Leu Ile Pro Ala Ala Gln Leu Lys Asn Thr Asn Gln Lys Lys
            580                 585                 590
Glu Leu Glu Val Asp Cys Gly Leu Asp Lys Ser Asn Cys Gly Lys Gln
        595                 600                 605
Gln Asn His Thr Leu Asp Tyr Asn Leu Ala Pro Gly Pro Leu Gly Arg
    610                 615                 620
Gly Thr Met Pro Gly Lys Phe Pro His Ser Asp Lys Ser Leu Gly Glu
625                 630                 635                 640
Lys Ala Pro Leu Arg Leu His Ser Glu Lys Pro Glu Cys Arg Ile Ser
                645                 650                 655
Ala Ile Cys Ser Pro Arg Asp Ser Met Tyr Gln Ser Val Cys Leu Ile
            660                 665                 670
Ser Glu Glu Arg Asn Glu Cys Val Ile Ala Thr Glu Val
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<210> 9
<211> 3451
<212> DNA
<213> Mus musculus

<400> 9

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ctcgagaccc taggatttgc tccaggacac gtacttagag cagccaccgc ccagtcgccc     180
tcacctggat tacctaccga ggcatcgagc agcggagttt ttgagaaggc gacaagggag     240
cagcgtcccg aggggaatca gcttttcagg aactcggctg gcagacggga cttgcgggag     300
agcgacatcc ctaacaagca gattcggagt cccggagtgg agaggacacc ccaagggatg     360
acgcctgcgt cccggagcgc ctgtcgctgg gcgctactgc tgctggcggt actgtggccg     420
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tgccttaagc acttccaggc aaccttctcc gagggaccct gcacctttgg caatgtctcc     600
acgccggtat tgggcaccaa ctccttcgtc gtcagggaca agaatagcgg cagtggtcgc     660
aaccctctgc agttgccctt caatttcacc tggccgggaa ccttctcact caacatccaa     720
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aatgacaccc tcaccagact gagctactct taccgggtca tctgcagtga caactactat     900
ggagagagct gttctcgcct atgcaagaag cgcgatgacc acttcggaca ttatgagtgc     960
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<210> 10
<211> 686
<212> PRT
<213> Mus musculus

<400> 10
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            20                  25                  30
Leu Arg Leu Gln Glu Phe Val Asn Gln Arg Gly Met Leu Ala Asn Gly
        35                  40                  45
Gln Ser Cys Glu Pro Gly Cys Arg Thr Phe Phe Arg Ile Cys Leu Lys
    50                  55                  60
His Phe Gln Ala Thr Phe Ser Glu Gly Pro Cys Thr Phe Gly Asn Val
65                  70                  75                  80
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Ser Thr Pro Val Leu Gly Thr Asn Ser Phe Val Val Arg Asp Lys Asn
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Ser Gly Ser Gly Arg Asn Pro Leu Gln Leu Pro Phe Asn Phe Thr Trp
            100                 105                 110
Pro Gly Thr Phe Ser Leu Asn Ile Gln Ala Trp His Thr Pro Gly Asp
        115                 120                 125
Asp Leu Arg Pro Glu Thr Ser Pro Gly Asn Ser Leu Ile Ser Gln Ile
    130                 135                 140
Ile Ile Gln Gly Ser Leu Ala Val Gly Lys Ile Trp Arg Thr Asp Glu
145                 150                 155                 160
Gln Asn Asp Thr Leu Thr Arg Leu Ser Tyr Ser Tyr Arg Val Ile Cys
                165                 170                 175
Ser Asp Asn Tyr Tyr Gly Glu Ser Cys Ser Arg Leu Cys Lys Lys Arg
            180                 185                 190
Asp Asp His Phe Gly His Tyr Glu Cys Gln Pro Asp Gly Ser Leu Ser
        195                 200                 205
Cys Leu Pro Gly Trp Thr Gly Lys Tyr Cys Asp Gln Pro Ile Cys Leu
    210                 215                 220
Ser Gly Cys His Glu Gln Asn Gly Tyr Cys Ser Lys Pro Asp Glu Cys
225                 230                 235                 240
Ile Cys Arg Pro Gly Trp Gln Gly Arg Leu Cys Asn Glu Cys Ile Pro
                245                 250                 255
His Asn Gly Cys Arg His Gly Thr Cys Ser Ile Pro Trp Gln Cys Ala
            260                 265                 270
Cys Asp Glu Gly Trp Gly Gly Leu Phe Cys Asp Gln Asp Leu Asn Tyr
        275                 280                 285
Cys Thr His His Ser Pro Cys Lys Asn Gly Ser Thr Cys Ser Asn Ser
    290                 295                 300
Gly Pro Lys Gly Tyr Thr Cys Thr Cys Leu Pro Gly Tyr Thr Gly Glu
305                 310                 315                 320
His Cys Glu Leu Gly Leu Ser Lys Cys Ala Ser Asn Pro Cys Arg Asn
                325                 330                 335
Gly Gly Ser Cys Lys Asp Gln Glu Asn Ser Tyr His Cys Leu Cys Pro
            340                 345                 350
Pro Gly Tyr Tyr Gly Gln His Cys Glu His Ser Thr Leu Thr Cys Ala
        355                 360                 365
Asp Ser Pro Cys Phe Asn Gly Gly Ser Cys Arg Glu Arg Asn Gln Gly
    370                 375                 380
Ser Ser Tyr Ala Cys Glu Cys Pro Pro Asn Phe Thr Gly Ser Asn Cys
385                 390                 395                 400
Glu Lys Lys Val Asp Arg Cys Thr Ser Asn Pro Cys Ala Asn Gly Gly
                405                 410                 415
Gln Cys Gln Asn Arg Gly Pro Ser Arg Thr Cys Arg Cys Arg Pro Gly
            420                 425                 430
Phe Thr Gly Thr His Cys Glu Leu His Ile Ser Asp Cys Ala Arg Ser
        435                 440                 445
Pro Cys Ala His Gly Gly Thr Cys His Asp Leu Glu Asn Gly Pro Val
    450                 455                 460
Cys Thr Cys Pro Ala Gly Phe Ser Gly Arg Arg Cys Glu Val Arg Ile
465                 470                 475                 480
Thr His Asp Ala Cys Ala Ser Gly Pro Cys Phe Asn Gly Ala Thr Cys
                485                 490                 495
Tyr Thr Gly Leu Ser Pro Asn Asn Phe Val Cys Asn Cys Pro Tyr Gly
            500                 505                 510
Phe Val Gly Ser Arg Cys Glu Phe Pro Val Gly Leu Pro Pro Ser Phe
        515                 520                 525
Pro Trp Val Ala Val Ser Leu Gly Val Gly Leu Val Val Leu Leu Val
    530                 535                 540
Leu Leu Val Met Val Val Val Ala Val Arg Gln Leu Arg Leu Arg Arg
545                 550                 555                 560
Pro Asp Asp Glu Ser Arg Glu Ala Met Asn Asn Leu Ser Asp Phe Gln
                565                 570                 575
Lys Asp Asn Leu Ile Pro Ala Ala Gln Leu Lys Asn Thr Asn Gln Lys
            580                 585                 590
Lys Glu Leu Glu Val Asp Cys Gly Leu Asp Lys Ser Asn Cys Gly Lys
        595                 600                 605
Leu Gln Asn His Thr Leu Asp Tyr Asn Leu Ala Pro Gly Leu Leu Gly
    610                 615                 620
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Arg Gly Gly Met Pro Gly Lys Tyr Pro His Ser Asp Lys Ser Leu Gly
625 630 635 640
Glu Lys Val Pro Leu Arg Leu His Ser Glu Lys Pro Glu Cys Arg Ile
645 650 655
Ser Ala Ile Cys Ser Pro Arg Asp Ser Met Tyr Gln Ser Val Cys Leu
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Ile Ser Glu Glu Arg Asn Glu Cys Val Ile Ala Thr Glu Val
675 680 685

<210> 11
<211> 2977
<212> DNA
<213> Homo sapiens

<400> 11
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cagagccggg acggcagccc aggcgcccgg gccccgccgt ctcctcgccg cgatcctgga 180
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<210> 12
<211> 497

<212> PRT
<213> Homo sapiens

<400> 12
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Thr Leu Arg Ser Gly Pro Gly Cys Leu Gln Gln Pro Glu Gln Gln Gly
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Val Arg Asp Pro Gly Gly Ile Trp Ala Lys Leu Gly Ala Ala Glu Ala
        35   40   45
Ser Ala Glu Arg Leu Gln Gly Arg Arg Ser Arg Gly Ala Ser Gly Ser
    50   55   60
Glu Pro Gln Gln Met Gly Ser Asp Val Arg Asp Leu Asn Ala Leu Leu
65   70   75   80
Pro Ala Val Pro Ser Leu Gly Gly Gly Gly Gly Cys Ala Leu Pro Val
                85   90   95
Ser Gly Ala Ala Gln Trp Ala Pro Val Leu Asp Phe Ala Pro Pro Gly
            100   105   110
Ala Ser Ala Tyr Gly Ser Leu Gly Gly Pro Ala Pro Pro Pro Ala Pro
        115   120   125
Pro Pro Pro Pro Pro Pro Pro Pro His Ser Phe Ile Lys Gln Glu Pro
    130   135   140
Ser Trp Gly Gly Ala Glu Pro His Glu Glu Gln Cys Leu Ser Ala Phe
145   150   155   160
Thr Val His Phe Ser Gly Gln Phe Thr Gly Thr Ala Gly Ala Cys Arg
                165   170   175
Tyr Gly Pro Phe Gly Pro Pro Pro Pro Ser Gln Ala Ser Ser Gly Gln
            180   185   190
Ala Arg Met Phe Pro Asn Ala Pro Tyr Leu Pro Ser Cys Leu Glu Ser
        195   200   205
Gln Pro Ala Ile Arg Asn Gln Gly Tyr Ser Thr Val Thr Phe Asp Gly
    210   215   220
Thr Pro Ser Tyr Gly His Thr Pro Ser His His Ala Ala Gln Phe Pro
225   230   235   240
Asn His Ser Phe Lys His Glu Asp Pro Met Gly Gln Gln Gly Ser Leu
                245   250   255
Gly Glu Gln Gln Tyr Ser Val Pro Pro Pro Val Tyr Gly Cys His Thr
            260   265   270
Pro Thr Asp Ser Cys Thr Gly Ser Gln Ala Leu Leu Leu Arg Thr Pro
        275   280   285
Tyr Ser Ser Asp Asn Leu Tyr Gln Met Thr Ser Gln Leu Glu Cys Met
    290   295   300
Thr Trp Asn Gln Met Asn Leu Gly Ala Thr Leu Lys Gly His Ser Thr
305   310   315   320
Gly Tyr Glu Ser Asp Asn His Thr Thr Pro Ile Leu Cys Gly Ala Gln
                325   330   335
Tyr Arg Ile His Thr His Gly Val Phe Arg Gly Ile Gln Asp Val Arg
            340   345   350
Arg Val Pro Gly Val Ala Pro Thr Leu Val Arg Ser Ala Ser Glu Thr
        355   360   365
Ser Glu Lys Arg Pro Phe Met Cys Ala Tyr Pro Gly Cys Asn Lys Arg
    370   375   380
Tyr Phe Lys Leu Ser His Leu Gln Met His Ser Arg Lys His Thr Gly
385   390   395   400
Glu Lys Pro Tyr Gln Cys Asp Phe Lys Asp Cys Glu Arg Arg Phe Ser
                405   410   415
Arg Ser Asp Gln Leu Lys Arg His Gln Arg Arg His Thr Gly Val Lys
            420   425   430
Pro Phe Gln Cys Lys Thr Cys Gln Arg Lys Phe Ser Arg Ser Asp His
        435   440   445
Leu Lys Thr His Thr Arg Thr His Thr Gly Glu Lys Pro Phe Ser Cys
    450   455   460
Arg Trp Pro Ser Cys Gln Lys Lys Phe Ala Arg Ser Asp Glu Leu Val
465   470   475   480
Arg His His Asn Met His Gln Arg Asn Met Thr Lys Leu Gln Leu Ala
                485   490   495
Leu

<210> 13
<211> 3028
<212> DNA
<213> Homo sapiens

<400> 13
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cagagccggg acggcagccc aggcgcccgg gccccgccgt ctcctcgccg cgatcctgga 180
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<210> 14
<211> 514
<212> PRT
<213> Homo sapiens

<400> 14
Met Gln Asp Pro Ala Ser Thr Cys Val Pro Glu Pro Ala Ser Gln His
 1   5   10   15
Thr Leu Arg Ser Gly Pro Gly Cys Leu Gln Gln Pro Glu Gln Gln Gly

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            20                  25                  30
Val Arg Asp Pro Gly Gly Ile Trp Ala Lys Leu Gly Ala Ala Glu Ala
        35                  40                  45
Ser Ala Glu Arg Leu Gln Gly Arg Arg Ser Arg Gly Ala Ser Gly Ser
    50                  55                  60
Glu Pro Gln Gln Met Gly Ser Asp Val Arg Asp Leu Asn Ala Leu Leu
65                  70                  75                  80
Pro Ala Val Pro Ser Leu Gly Gly Gly Gly Gly Cys Ala Leu Pro Val
                85                  90                  95
Ser Gly Ala Ala Gln Trp Ala Pro Val Leu Asp Phe Ala Pro Pro Gly
            100                 105                 110
Ala Ser Ala Tyr Gly Ser Leu Gly Gly Pro Ala Pro Pro Pro Ala Pro
        115                 120                 125
Pro Pro Pro Pro Pro Pro Pro Pro His Ser Phe Ile Lys Gln Glu Pro
    130                 135                 140
Ser Trp Gly Gly Ala Glu Pro His Glu Glu Gln Cys Leu Ser Ala Phe
145                 150                 155                 160
Thr Val His Phe Ser Gly Gln Phe Thr Gly Thr Ala Gly Ala Cys Arg
                165                 170                 175
Tyr Gly Pro Phe Gly Pro Pro Pro Pro Ser Gln Ala Ser Ser Gly Gln
            180                 185                 190
Ala Arg Met Phe Pro Asn Ala Pro Tyr Leu Pro Ser Cys Leu Glu Ser
        195                 200                 205
Gln Pro Ala Ile Arg Asn Gln Gly Tyr Ser Thr Val Thr Phe Asp Gly
    210                 215                 220
Thr Pro Ser Tyr Gly His Thr Pro Ser His His Ala Ala Gln Phe Pro
225                 230                 235                 240
Asn His Ser Phe Lys His Glu Asp Pro Met Gly Gln Gln Gly Ser Leu
                245                 250                 255
Gly Glu Gln Gln Tyr Ser Val Pro Pro Pro Val Tyr Gly Cys His Thr
            260                 265                 270
Pro Thr Asp Ser Cys Thr Gly Ser Gln Ala Leu Leu Leu Arg Thr Pro
        275                 280                 285
Tyr Ser Ser Asp Asn Leu Tyr Gln Met Thr Ser Gln Leu Glu Cys Met
    290                 295                 300
Thr Trp Asn Gln Met Asn Leu Gly Ala Thr Leu Lys Gly Val Ala Ala
305                 310                 315                 320
Gly Ser Ser Ser Ser Val Lys Trp Thr Glu Gly Gln Ser Asn His Ser
                325                 330                 335
Thr Gly Tyr Glu Ser Asp Asn His Thr Thr Pro Ile Leu Cys Gly Ala
            340                 345                 350
Gln Tyr Arg Ile His Thr His Gly Val Phe Arg Gly Ile Gln Asp Val
        355                 360                 365
Arg Arg Val Pro Gly Val Ala Pro Thr Leu Val Arg Ser Ala Ser Glu
    370                 375                 380
Thr Ser Glu Lys Arg Pro Phe Met Cys Ala Tyr Pro Gly Cys Asn Lys
385                 390                 395                 400
Arg Tyr Phe Lys Leu Ser His Leu Gln Met His Ser Arg Lys His Thr
                405                 410                 415
Gly Glu Lys Pro Tyr Gln Cys Asp Phe Lys Asp Cys Glu Arg Arg Phe
            420                 425                 430
Ser Arg Ser Asp Gln Leu Lys Arg His Gln Arg Arg His Thr Gly Val
        435                 440                 445
Lys Pro Phe Gln Cys Lys Thr Cys Gln Arg Lys Phe Ser Arg Ser Asp
    450                 455                 460
His Leu Lys Thr His Thr Arg Thr His Thr Gly Glu Lys Pro Phe Ser
465                 470                 475                 480
Cys Arg Trp Pro Ser Cys Gln Lys Lys Phe Ala Arg Ser Asp Glu Leu
                485                 490                 495
Val Arg His His Asn Met His Gln Arg Asn Met Thr Lys Leu Gln Leu
            500                 505                 510
Ala Leu
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<210> 15
<211> 3037
<212> DNA
<213> Homo sapiens

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cagagccggg acggcagccc aggcgcccgg gccccgccgt ctcctcgccg cgatcctgga 180
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<210> 16
<211> 517
<212> PRT
<213> Homo sapiens

<400> 16
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Thr Leu Arg Ser Gly Pro Gly Cys Leu Gln Gln Pro Glu Gln Gln Gly
            20   25   30
Val Arg Asp Pro Gly Gly Ile Trp Ala Lys Leu Gly Ala Ala Glu Ala
        35   40   45
Ser Ala Glu Arg Leu Gln Gly Arg Arg Ser Arg Gly Ala Ser Gly Ser
    50   55   60

Glu Pro Gln Gln Met Gly Ser Asp Val Arg Asp Leu Asn Ala Leu Leu
65 70 75 80
Pro Ala Val Pro Ser Leu Gly Gly Gly Gly Gly Cys Ala Leu Pro Val
85 90 95
Ser Gly Ala Ala Gln Trp Ala Pro Val Leu Asp Phe Ala Pro Pro Gly
100 105 110
Ala Ser Ala Tyr Gly Ser Leu Gly Gly Pro Ala Pro Pro Pro Ala Pro
115 120 125
Pro Pro Pro Pro Pro Pro Pro Pro His Ser Phe Ile Lys Gln Glu Pro
130 135 140
Ser Trp Gly Gly Ala Glu Pro His Glu Glu Gln Cys Leu Ser Ala Phe
145 150 155 160
Thr Val His Phe Ser Gly Gln Phe Thr Gly Thr Ala Gly Ala Cys Arg
165 170 175
Tyr Gly Pro Phe Gly Pro Pro Pro Pro Ser Gln Ala Ser Ser Gly Gln
180 185 190
Ala Arg Met Phe Pro Asn Ala Pro Tyr Leu Pro Ser Cys Leu Glu Ser
195 200 205
Gln Pro Ala Ile Arg Asn Gln Gly Tyr Ser Thr Val Thr Phe Asp Gly
210 215 220
Thr Pro Ser Tyr Gly His Thr Pro Ser His His Ala Ala Gln Phe Pro
225 230 235 240
Asn His Ser Phe Lys His Glu Asp Pro Met Gly Gln Gln Gly Ser Leu
245 250 255
Gly Glu Gln Gln Tyr Ser Val Pro Pro Pro Val Tyr Gly Cys His Thr
260 265 270
Pro Thr Asp Ser Cys Thr Gly Ser Gln Ala Leu Leu Leu Arg Thr Pro
275 280 285
Tyr Ser Ser Asp Asn Leu Tyr Gln Met Thr Ser Gln Leu Glu Cys Met
290 295 300
Thr Trp Asn Gln Met Asn Leu Gly Ala Thr Leu Lys Gly Val Ala Ala
305 310 315 320
Gly Ser Ser Ser Ser Val Lys Trp Thr Glu Gly Gln Ser Asn His Ser
325 330 335
Thr Gly Tyr Glu Ser Asp Asn His Thr Thr Pro Ile Leu Cys Gly Ala
340 345 350
Gln Tyr Arg Ile His Thr His Gly Val Phe Arg Gly Ile Gln Asp Val
355 360 365
Arg Arg Val Pro Gly Val Ala Pro Thr Leu Val Arg Ser Ala Ser Glu
370 375 380
Thr Ser Glu Lys Arg Pro Phe Met Cys Ala Tyr Pro Gly Cys Asn Lys
385 390 395 400
Arg Tyr Phe Lys Leu Ser His Leu Gln Met His Ser Arg Lys His Thr
405 410 415
Gly Glu Lys Pro Tyr Gln Cys Asp Phe Lys Asp Cys Glu Arg Arg Phe
420 425 430
Ser Arg Ser Asp Gln Leu Lys Arg His Gln Arg Arg His Thr Gly Val
435 440 445
Lys Pro Phe Gln Cys Lys Thr Cys Gln Arg Lys Phe Ser Arg Ser Asp
450 455 460
His Leu Lys Thr His Thr Arg Thr His Thr Gly Lys Thr Ser Glu Lys
465 470 475 480
Pro Phe Ser Cys Arg Trp Pro Ser Cys Gln Lys Lys Phe Ala Arg Ser
485 490 495
Asp Glu Leu Val Arg His His Asn Met His Gln Arg Asn Met Thr Lys
500 505 510
Leu Gln Leu Ala Leu
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<210> 17
<211> 2438
<212> DNA
<213> Homo sapiens

<400> 17
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gggcatcctt gggcccgagt tctggggtgc ggacggacgt ctcgagagtg ggtgccgcga 180

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gccaggcttt gctgctgagg acgccctaca gcagtgacaa tttataccaa atgacatccc     540
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<210> 18
<211> 288
<212> PRT
<213> Homo sapiens

<400> 18

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Gly His Thr Pro Ser His His Ala Ala Gln Phe Pro Asn His Ser Phe
            20                  25                  30
Lys His Glu Asp Pro Met Gly Gln Gln Gly Ser Leu Gly Glu Gln Gln
        35                  40                  45
Tyr Ser Val Pro Pro Pro Val Tyr Gly Cys His Thr Pro Thr Asp Ser
    50                  55                  60
Cys Thr Gly Ser Gln Ala Leu Leu Leu Arg Thr Pro Tyr Ser Ser Asp
65                  70                  75                  80
Asn Leu Tyr Gln Met Thr Ser Gln Leu Glu Cys Met Thr Trp Asn Gln
                85                  90                  95
Met Asn Leu Gly Ala Thr Leu Lys Gly His Ser Thr Gly Tyr Glu Ser
            100                 105                 110
Asp Asn His Thr Thr Pro Ile Leu Cys Gly Ala Gln Tyr Arg Ile His
        115                 120                 125
Thr His Gly Val Phe Arg Gly Ile Gln Asp Val Arg Arg Val Pro Gly
    130                 135                 140
Val Ala Pro Thr Leu Val Arg Ser Ala Ser Glu Thr Ser Glu Lys Arg
145                 150                 155                 160
Pro Phe Met Cys Ala Tyr Pro Gly Cys Asn Lys Arg Tyr Phe Lys Leu
                165                 170                 175
Ser His Leu Gln Met His Ser Arg Lys His Thr Gly Glu Lys Pro Tyr
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            180                 185                 190
Gln Cys Asp Phe Lys Asp Cys Glu Arg Arg Phe Ser Arg Ser Asp Gln
        195                 200                 205
Leu Lys Arg His Gln Arg Arg His Thr Gly Val Lys Pro Phe Gln Cys
    210                 215                 220
Lys Thr Cys Gln Arg Lys Phe Ser Arg Ser Asp His Leu Lys Thr His
225                 230                 235                 240
Thr Arg Thr His Thr Gly Lys Thr Ser Glu Lys Pro Phe Ser Cys Arg
                245                 250                 255
Trp Pro Ser Cys Gln Lys Lys Phe Ala Arg Ser Asp Glu Leu Val Arg
            260                 265                 270
His His Asn Met His Gln Arg Asn Met Thr Lys Leu Gln Leu Ala Leu
        275                 280                 285
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<210> 19
<211> 2480
<212> DNA
<213> Homo sapiens

<400> 19

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ctcgggaccc acggccctcg ccgggcacgg acagttgcgg agcagggctc tgaggattgt     240
gcagtgccct gggtccctgc ctactcctgg gctcaggaat ggagaagggt tacagcacgg     300
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tggtttccat ttactaacag caacagcaag aaataaatca gagagcaagg catcgggggt    1680
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<210> 20
<211> 302
<212> PRT
<213> Homo sapiens

<400> 20

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            20                  25                  30
Lys His Glu Asp Pro Met Gly Gln Gln Gly Ser Leu Gly Glu Gln Gln
        35                  40                  45
Tyr Ser Val Pro Pro Pro Val Tyr Gly Cys His Thr Pro Thr Asp Ser
    50                  55                  60
Cys Thr Gly Ser Gln Ala Leu Leu Leu Arg Thr Pro Tyr Ser Ser Asp
65                  70                  75                  80
Asn Leu Tyr Gln Met Thr Ser Gln Leu Glu Cys Met Thr Trp Asn Gln
                85                  90                  95
Met Asn Leu Gly Ala Thr Leu Lys Gly Val Ala Ala Gly Ser Ser Ser
            100                 105                 110
Ser Val Lys Trp Thr Glu Gly Gln Ser Asn His Ser Thr Gly Tyr Glu
        115                 120                 125
Ser Asp Asn His Thr Thr Pro Ile Leu Cys Gly Ala Gln Tyr Arg Ile
    130                 135                 140
His Thr His Gly Val Phe Arg Gly Ile Gln Asp Val Arg Arg Val Pro
145                 150                 155                 160
Gly Val Ala Pro Thr Leu Val Arg Ser Ala Ser Glu Thr Ser Glu Lys
                165                 170                 175
Arg Pro Phe Met Cys Ala Tyr Pro Gly Cys Asn Lys Arg Tyr Phe Lys
            180                 185                 190
Leu Ser His Leu Gln Met His Ser Arg Lys His Thr Gly Glu Lys Pro
        195                 200                 205
Tyr Gln Cys Asp Phe Lys Asp Cys Glu Arg Arg Phe Ser Arg Ser Asp
    210                 215                 220
Gln Leu Lys Arg His Gln Arg Arg His Thr Gly Val Lys Pro Phe Gln
225                 230                 235                 240
Cys Lys Thr Cys Gln Arg Lys Phe Ser Arg Ser Asp His Leu Lys Thr
                245                 250                 255
His Thr Arg Thr His Thr Gly Glu Lys Pro Phe Ser Cys Arg Trp Pro
            260                 265                 270
Ser Cys Gln Lys Lys Phe Ala Arg Ser Asp Glu Leu Val Arg His His
        275                 280                 285
Asn Met His Gln Arg Asn Met Thr Lys Leu Gln Leu Ala Leu
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<210> 21
<211> 3092
<212> DNA
<213> Mus musculus

<400> 21

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gcccacaccc ggggctctcc gcaacccgac cgcctgcctg ctcccccttt ccttttcccg     180
ccctccctcc cacccactca ttcacccacc cacccagaga gaggacggca gcccaggaac     240
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cacgtgtgtc ccggagccgg cgtctcagca cacgctccgc cgggagcccg ggtgcgtcca     360
gcagccggag caacctgggg accgaggccc ccggagcgcc tgggccaagt ccagcgccga     420
gaatccgcag gatcgcagga gcggagaacc gtccgcatcc gagccgcacc tcatgggttc     480
cgacgtgcgg gacctgaacg cgctgctgcc cgctgtgtct tcgctgggcg gcggcggcgg     540
cggctgcggg ctccctgtga gcggcgcagc gcagtgggcg cccgtgttgg acttcgcgcc     600
tccgggcgcc tcggcttacg ggtcgctggg cggtcccgcg cctcctcccg ctccgccgcc     660
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acacgactgt ggatctacat ccgacttcca agacagcaca cctgattgac tgcatcctat    1980
caggtttgcc ggaaggagtc ggtgctccgc ccacttttga ttaactcaca ggcctgaaaa    2040
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aaccattgtt gataatgccc cccgcccccc cccccgggtt tcctcttctc ctttgtgatc    2160
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<210> 22
<211> 517
<212> PRT
<213> Mus musculus

<400> 22

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            20                  25                  30
Pro Glu Gln Pro Gly Asp Arg Gly Pro Arg Ser Ala Trp Ala Lys Ser
        35                  40                  45
Ser Ala Glu Asn Pro Gln Asp Arg Arg Ser Gly Glu Pro Ser Ala Ser
    50                  55                  60
Glu Pro His Leu Met Gly Ser Asp Val Arg Asp Leu Asn Ala Leu Leu
65                  70                  75                  80
Pro Ala Val Ser Ser Leu Gly Gly Gly Gly Gly Gly Cys Gly Leu Pro
                85                  90                  95
Val Ser Gly Ala Ala Gln Trp Ala Pro Val Leu Asp Phe Ala Pro Pro
            100                 105                 110
Gly Ala Ser Ala Tyr Gly Ser Leu Gly Gly Pro Ala Pro Pro Pro Ala
        115                 120                 125
Pro Pro Pro Pro Pro Pro Pro Pro His Ser Phe Ile Lys Gln Glu Pro
    130                 135                 140
Ser Trp Gly Gly Ala Glu Pro His Glu Glu Gln Cys Leu Ser Ala Phe
145                 150                 155                 160
Thr Leu His Phe Ser Gly Gln Phe Thr Gly Thr Ala Gly Ala Cys Arg
                165                 170                 175
Tyr Gly Pro Phe Gly Pro Pro Pro Pro Ser Gln Ala Ser Ser Gly Gln
            180                 185                 190
Ala Arg Met Phe Pro Asn Ala Pro Tyr Leu Pro Ser Cys Leu Glu Ser
        195                 200                 205
Gln Pro Thr Ile Arg Asn Gln Gly Tyr Ser Thr Val Thr Phe Asp Gly
    210                 215                 220
Ala Pro Ser Tyr Gly His Thr Pro Ser His His Ala Ala Gln Phe Pro
225                 230                 235                 240
Asn His Ser Phe Lys His Glu Asp Pro Met Gly Gln Gln Gly Ser Leu
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                245                 250                 255
Gly Glu Gln Gln Tyr Ser Val Pro Pro Pro Val Tyr Gly Cys His Thr
            260                 265                 270
Pro Thr Asp Ser Cys Thr Gly Ser Gln Ala Leu Leu Leu Arg Thr Pro
        275                 280                 285
Tyr Ser Ser Asp Asn Leu Tyr Gln Met Thr Ser Gln Leu Glu Cys Met
    290                 295                 300
Thr Trp Asn Gln Met Asn Leu Gly Ala Thr Leu Lys Gly Met Ala Ala
305                 310                 315                 320
Gly Ser Ser Ser Ser Val Lys Trp Thr Glu Gly Gln Ser Asn His Gly
                325                 330                 335
Thr Gly Tyr Glu Ser Glu Asn His Thr Ala Pro Ile Leu Cys Gly Ala
            340                 345                 350
Gln Tyr Arg Ile His Thr His Gly Val Phe Arg Gly Ile Gln Asp Val
        355                 360                 365
Arg Arg Val Ser Gly Val Ala Pro Thr Leu Val Arg Ser Ala Ser Glu
    370                 375                 380
Thr Ser Glu Lys Arg Pro Phe Met Cys Ala Tyr Pro Gly Cys Asn Lys
385                 390                 395                 400
Arg Tyr Phe Lys Leu Ser His Leu Gln Met His Ser Arg Lys His Thr
                405                 410                 415
Gly Glu Lys Pro Tyr Gln Cys Asp Phe Lys Asp Cys Glu Arg Arg Phe
            420                 425                 430
Ser Arg Ser Asp Gln Leu Lys Arg His Gln Arg Arg His Thr Gly Val
        435                 440                 445
Lys Pro Phe Gln Cys Lys Thr Cys Gln Arg Lys Phe Ser Arg Ser Asp
    450                 455                 460
His Leu Lys Thr His Thr Arg Thr His Thr Gly Lys Thr Ser Glu Lys
465                 470                 475                 480
Pro Phe Ser Cys Arg Trp His Ser Cys Gln Lys Lys Phe Ala Arg Ser
                485                 490                 495
Asp Glu Leu Val Arg His His Asn Met His Gln Arg Asn Met Thr Lys
            500                 505                 510
Leu Gln Leu Ala Leu
        515
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<210> 23
<211> 2126
<212> DNA
<213> Homo sapiens

<400> 23

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cggctcgacc cctgttgggg tcctgtggga cccccgccct cggcagcctc ctgttcctgc     180
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agacacgtaa aaaaaaaaaa aaaaaa 2126

<210> 24
<211> 622
<212> PRT
<213> Homo sapiens

<400> 24
Met Ala Leu Pro Thr Ala Arg Pro Leu Leu Gly Ser Cys Gly Thr Pro
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Ala Leu Gly Ser Leu Leu Phe Leu Leu Phe Ser Leu Gly Trp Val Gln
            20   25   30
Pro Ser Arg Thr Leu Ala Gly Glu Thr Gly Gln Glu Ala Ala Pro Leu
        35   40   45
Asp Gly Val Leu Ala Asn Pro Pro Asn Ile Ser Ser Leu Ser Pro Arg
    50   55   60
Gln Leu Leu Gly Phe Pro Cys Ala Glu Val Ser Gly Leu Ser Thr Glu
65   70   75   80
Arg Val Arg Glu Leu Ala Val Ala Leu Ala Gln Lys Asn Val Lys Leu
                85   90   95
Ser Thr Glu Gln Leu Arg Cys Leu Ala His Arg Leu Ser Glu Pro Pro
            100   105   110
Glu Asp Leu Asp Ala Leu Pro Leu Asp Leu Leu Leu Phe Leu Asn Pro
        115   120   125
Asp Ala Phe Ser Gly Pro Gln Ala Cys Thr Arg Phe Phe Ser Arg Ile
    130   135   140
Thr Lys Ala Asn Val Asp Leu Leu Pro Arg Gly Ala Pro Glu Arg Gln
145   150   155   160
Arg Leu Leu Pro Ala Ala Leu Ala Cys Trp Gly Val Arg Gly Ser Leu
                165   170   175
Leu Ser Glu Ala Asp Val Arg Ala Leu Gly Gly Leu Ala Cys Asp Leu
            180   185   190
Pro Gly Arg Phe Val Ala Glu Ser Ala Glu Val Leu Leu Pro Arg Leu
        195   200   205
Val Ser Cys Pro Gly Pro Leu Asp Gln Asp Gln Gln Glu Ala Ala Arg
    210   215   220
Ala Ala Leu Gln Gly Gly Gly Pro Pro Tyr Gly Pro Pro Ser Thr Trp
225   230   235   240
Ser Val Ser Thr Met Asp Ala Leu Arg Gly Leu Leu Pro Val Leu Gly
                245   250   255
Gln Pro Ile Ile Arg Ser Ile Pro Gln Gly Ile Val Ala Ala Trp Arg
            260   265   270
Gln Arg Ser Ser Arg Asp Pro Ser Trp Arg Gln Pro Glu Arg Thr Ile
        275   280   285
Leu Arg Pro Arg Phe Arg Arg Glu Val Glu Lys Thr Ala Cys Pro Ser
    290   295   300
Gly Lys Lys Ala Arg Glu Ile Asp Glu Ser Leu Ile Phe Tyr Lys Lys
305   310   315   320
Trp Glu Leu Glu Ala Cys Val Asp Ala Ala Leu Leu Ala Thr Gln Met
                325   330   335
Asp Arg Val Asn Ala Ile Pro Phe Thr Tyr Glu Gln Leu Asp Val Leu
            340   345   350
Lys His Lys Leu Asp Glu Leu Tyr Pro Gln Gly Tyr Pro Glu Ser Val
        355   360   365
Ile Gln His Leu Gly Tyr Leu Phe Leu Lys Met Ser Pro Glu Asp Ile
    370   375   380
Arg Lys Trp Asn Val Thr Ser Leu Glu Thr Leu Lys Ala Leu Leu Glu
385   390   395   400
Val Asn Lys Gly His Glu Met Ser Pro Gln Val Ala Thr Leu Ile Asp

405 410 415
Arg Phe Val Lys Gly Arg Gly Gln Leu Asp Lys Asp Thr Leu Asp Thr
420 425 430
Leu Thr Ala Phe Tyr Pro Gly Tyr Leu Cys Ser Leu Ser Pro Glu Glu
435 440 445
Leu Ser Ser Val Pro Pro Ser Ser Ile Trp Ala Val Arg Pro Gln Asp
450 455 460
Leu Asp Thr Cys Asp Pro Arg Gln Leu Asp Val Leu Tyr Pro Lys Ala
465 470 475 480
Arg Leu Ala Phe Gln Asn Met Asn Gly Ser Glu Tyr Phe Val Lys Ile
485 490 495
Gln Ser Phe Leu Gly Gly Ala Pro Thr Glu Asp Leu Lys Ala Leu Ser
500 505 510
Gln Gln Asn Val Ser Met Asp Leu Ala Thr Phe Met Lys Leu Arg Thr
515 520 525
Asp Ala Val Leu Pro Leu Thr Val Ala Glu Val Gln Lys Leu Leu Gly
530 535 540
Pro His Val Glu Gly Leu Lys Ala Glu Glu Arg His Arg Pro Val Arg
545 550 555 560
Asp Trp Ile Leu Arg Gln Arg Gln Asp Asp Leu Asp Thr Leu Gly Leu
565 570 575
Gly Leu Gln Gly Gly Ile Pro Asn Gly Tyr Leu Val Leu Asp Leu Ser
580 585 590
Met Gln Glu Ala Leu Ser Gly Thr Pro Cys Leu Leu Gly Pro Gly Pro
595 600 605
Val Leu Thr Val Leu Ala Leu Leu Leu Ala Ser Thr Leu Ala
610 615 620

<210> 25
<211> 2187
<212> DNA
<213> Homo sapiens

<400> 25
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cagacacgta aaaaaaaaaa aaaaaaa 2187

<210> 26
<211> 622
<212> PRT
<213> Homo sapiens

<400> 26
Met Ala Leu Pro Thr Ala Arg Pro Leu Leu Gly Ser Cys Gly Thr Pro
1 5 10 15
Ala Leu Gly Ser Leu Leu Phe Leu Leu Phe Ser Leu Gly Trp Val Gln
20 25 30
Pro Ser Arg Thr Leu Ala Gly Glu Thr Gly Gln Glu Ala Ala Pro Leu
35 40 45
Asp Gly Val Leu Ala Asn Pro Pro Asn Ile Ser Ser Leu Ser Pro Arg
50 55 60
Gln Leu Leu Gly Phe Pro Cys Ala Glu Val Ser Gly Leu Ser Thr Glu
65 70 75 80
Arg Val Arg Glu Leu Ala Val Ala Leu Ala Gln Lys Asn Val Lys Leu
85 90 95
Ser Thr Glu Gln Leu Arg Cys Leu Ala His Arg Leu Ser Glu Pro Pro
100 105 110
Glu Asp Leu Asp Ala Leu Pro Leu Asp Leu Leu Leu Phe Leu Asn Pro
115 120 125
Asp Ala Phe Ser Gly Pro Gln Ala Cys Thr Arg Phe Phe Ser Arg Ile
130 135 140
Thr Lys Ala Asn Val Asp Leu Leu Pro Arg Gly Ala Pro Glu Arg Gln
145 150 155 160
Arg Leu Leu Pro Ala Ala Leu Ala Cys Trp Gly Val Arg Gly Ser Leu
165 170 175
Leu Ser Glu Ala Asp Val Arg Ala Leu Gly Gly Leu Ala Cys Asp Leu
180 185 190
Pro Gly Arg Phe Val Ala Glu Ser Ala Glu Val Leu Leu Pro Arg Leu
195 200 205
Val Ser Cys Pro Gly Pro Leu Asp Gln Asp Gln Gln Glu Ala Ala Arg
210 215 220
Ala Ala Leu Gln Gly Gly Gly Pro Pro Tyr Gly Pro Pro Ser Thr Trp
225 230 235 240
Ser Val Ser Thr Met Asp Ala Leu Arg Gly Leu Leu Pro Val Leu Gly
245 250 255
Gln Pro Ile Ile Arg Ser Ile Pro Gln Gly Ile Val Ala Ala Trp Arg
260 265 270
Gln Arg Ser Ser Arg Asp Pro Ser Trp Arg Gln Pro Glu Arg Thr Ile
275 280 285
Leu Arg Pro Arg Phe Arg Arg Glu Val Glu Lys Thr Ala Cys Pro Ser
290 295 300
Gly Lys Lys Ala Arg Glu Ile Asp Glu Ser Leu Ile Phe Tyr Lys Lys
305 310 315 320
Trp Glu Leu Glu Ala Cys Val Asp Ala Ala Leu Leu Ala Thr Gln Met
325 330 335
Asp Arg Val Asn Ala Ile Pro Phe Thr Tyr Glu Gln Leu Asp Val Leu
340 345 350
Lys His Lys Leu Asp Glu Leu Tyr Pro Gln Gly Tyr Pro Glu Ser Val
355 360 365
Ile Gln His Leu Gly Tyr Leu Phe Leu Lys Met Ser Pro Glu Asp Ile
370 375 380
Arg Lys Trp Asn Val Thr Ser Leu Glu Thr Leu Lys Ala Leu Leu Glu
385 390 395 400
Val Asn Lys Gly His Glu Met Ser Pro Gln Val Ala Thr Leu Ile Asp
405 410 415
Arg Phe Val Lys Gly Arg Gly Gln Leu Asp Lys Asp Thr Leu Asp Thr
420 425 430
Leu Thr Ala Phe Tyr Pro Gly Tyr Leu Cys Ser Leu Ser Pro Glu Glu
435 440 445
Leu Ser Ser Val Pro Pro Ser Ser Ile Trp Ala Val Arg Pro Gln Asp
450 455 460

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Leu Asp Thr Cys Asp Pro Arg Gln Leu Asp Val Leu Tyr Pro Lys Ala
465                 470                 475                 480
Arg Leu Ala Phe Gln Asn Met Asn Gly Ser Glu Tyr Phe Val Lys Ile
                485                 490                 495
Gln Ser Phe Leu Gly Gly Ala Pro Thr Glu Asp Leu Lys Ala Leu Ser
            500                 505                 510
Gln Gln Asn Val Ser Met Asp Leu Ala Thr Phe Met Lys Leu Arg Thr
        515                 520                 525
Asp Ala Val Leu Pro Leu Thr Val Ala Glu Val Gln Lys Leu Leu Gly
    530                 535                 540
Pro His Val Glu Gly Leu Lys Ala Glu Glu Arg His Arg Pro Val Arg
545                 550                 555                 560
Asp Trp Ile Leu Arg Gln Arg Gln Asp Asp Leu Asp Thr Leu Gly Leu
                565                 570                 575
Gly Leu Gln Gly Gly Ile Pro Asn Gly Tyr Leu Val Leu Asp Leu Ser
            580                 585                 590
Met Gln Glu Ala Leu Ser Gly Thr Pro Cys Leu Leu Gly Pro Gly Pro
        595                 600                 605
Val Leu Thr Val Leu Ala Leu Leu Leu Ala Ser Thr Leu Ala
    610                 615                 620
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<210> 27
<211> 2154
<212> DNA
<213> Homo sapiens

<400> 27

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cgccacgcac tcctctttct gcctggccgg ccactcccgt ctgctgtgac gcgcggacag      60
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ccaacggctc gacccctgtt ggggtcctgt gggacccccg ccctcggcag cctcctgttc     180
ctgctcttca gcctcggatg ggtgcagccc tcgaggaccc tggctggaga gacagggcag     240
gaggctgcgc ccctggacgg agtcctggcc aacccaccta acatttccag cctctccccc     300
cgccaactcc ttggcttccc gtgtgcggag gtgtccggcc tgagcacgga gcgtgtccgg     360
gagctggctg tggccttggc acagaagaat gtcaagctct caacagagca gctgcgctgt     420
ctggctcacc ggctctctga gcccccgag gacctggacg ccctcccatt ggacctgctg     480
ctattcctca acccagatgc gttctcgggg ccccaggcct gcacccgttt cttctcccgc     540
atcacgaagg ccaatgtgga cctgctcccg agggggctc ccgagcgaca gcggctgctg     600
cctgcggctc tggcctgctg gggtgtgcgg gggtctctgc tgagcgaggc tgatgtgcgg     660
gctctgggag gcctggcttg cgacctgcct gggcgctttg tggccgagtc ggccgaagtg     720
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ccgcagggca tcgtggccgc gtggcggcaa cgctcctctc gggacccatc ctggcggcag     960
cctgaacgga ccatcctccg gccgcggttc cggcgggaag tggagaagac agcctgtcct    1020
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gaagcctgcg tggatgcggc cctgctggcc acccagatgg accgcgtgaa cgccatcccc    1140
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taccccgagt ctgtgatcca gcacctgggc tacctcttcc tcaagatgag ccctgaggac    1260
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atccagtcct tcctgggtgg ggcccccacg gaggatttga aggcgctcag tcagcagaat    1680
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ctcctagcct ccaccctggc ctgagggccc cactcccttg ctggccccag ccctgctggg    2040
gatccccgcc tggccaggag caggcacggg tggtccccgt tccaccccaa gagaactcgc    2100
gctcagtaaa cgggaacatg ccccctgcag acacgtaaaa aaaaaaaaaa aaaa           2154
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<210> 28
<211> 630
<212> PRT
<213> Homo sapiens

<400> 28
Met Ala Leu Pro Thr Ala Arg Pro Leu Leu Gly Ser Cys Gly Thr Pro
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Ala Leu Gly Ser Leu Leu Phe Leu Leu Phe Ser Leu Gly Trp Val Gln
            20   25   30
Pro Ser Arg Thr Leu Ala Gly Glu Thr Gly Gln Glu Ala Ala Pro Leu
        35   40   45
Asp Gly Val Leu Ala Asn Pro Pro Asn Ile Ser Ser Leu Ser Pro Arg
    50   55   60
Gln Leu Leu Gly Phe Pro Cys Ala Glu Val Ser Gly Leu Ser Thr Glu
65   70   75   80
Arg Val Arg Glu Leu Ala Val Ala Leu Ala Gln Lys Asn Val Lys Leu
                85   90   95
Ser Thr Glu Gln Leu Arg Cys Leu Ala His Arg Leu Ser Glu Pro Pro
            100   105   110
Glu Asp Leu Asp Ala Leu Pro Leu Asp Leu Leu Leu Phe Leu Asn Pro
        115   120   125
Asp Ala Phe Ser Gly Pro Gln Ala Cys Thr Arg Phe Phe Ser Arg Ile
    130   135   140
Thr Lys Ala Asn Val Asp Leu Leu Pro Arg Gly Ala Pro Glu Arg Gln
145   150   155   160
Arg Leu Leu Pro Ala Ala Leu Ala Cys Trp Gly Val Arg Gly Ser Leu
                165   170   175
Leu Ser Glu Ala Asp Val Arg Ala Leu Gly Gly Leu Ala Cys Asp Leu
            180   185   190
Pro Gly Arg Phe Val Ala Glu Ser Ala Glu Val Leu Leu Pro Arg Leu
        195   200   205
Val Ser Cys Pro Gly Pro Leu Asp Gln Asp Gln Gln Glu Ala Ala Arg
    210   215   220
Ala Ala Leu Gln Gly Gly Gly Pro Pro Tyr Gly Pro Pro Ser Thr Trp
225   230   235   240
Ser Val Ser Thr Met Asp Ala Leu Arg Gly Leu Leu Pro Val Leu Gly
                245   250   255
Gln Pro Ile Ile Arg Ser Ile Pro Gln Gly Ile Val Ala Ala Trp Arg
            260   265   270
Gln Arg Ser Ser Arg Asp Pro Ser Trp Arg Gln Pro Glu Arg Thr Ile
        275   280   285
Leu Arg Pro Arg Phe Arg Arg Glu Val Glu Lys Thr Ala Cys Pro Ser
    290   295   300
Gly Lys Lys Ala Arg Glu Ile Asp Glu Ser Leu Ile Phe Tyr Lys Lys
305   310   315   320
Trp Glu Leu Glu Ala Cys Val Asp Ala Ala Leu Leu Ala Thr Gln Met
                325   330   335
Asp Arg Val Asn Ala Ile Pro Phe Thr Tyr Glu Gln Leu Asp Val Leu
            340   345   350
Lys His Lys Leu Asp Glu Leu Tyr Pro Gln Gly Tyr Pro Glu Ser Val
        355   360   365
Ile Gln His Leu Gly Tyr Leu Phe Leu Lys Met Ser Pro Glu Asp Ile
    370   375   380
Arg Lys Trp Asn Val Thr Ser Leu Glu Thr Leu Lys Ala Leu Leu Glu
385   390   395   400
Val Asn Lys Gly His Glu Met Ser Pro Gln Ala Pro Arg Arg Pro Leu
                405   410   415
Pro Gln Val Ala Thr Leu Ile Asp Arg Phe Val Lys Gly Arg Gly Gln
            420   425   430
Leu Asp Lys Asp Thr Leu Asp Thr Leu Thr Ala Phe Tyr Pro Gly Tyr
        435   440   445
Leu Cys Ser Leu Ser Pro Glu Glu Leu Ser Ser Val Pro Pro Ser Ser
    450   455   460
Ile Trp Ala Val Arg Pro Gln Asp Leu Asp Thr Cys Asp Pro Arg Gln
465   470   475   480
Leu Asp Val Leu Tyr Pro Lys Ala Arg Leu Ala Phe Gln Asn Met Asn
                485   490   495
Gly Ser Glu Tyr Phe Val Lys Ile Gln Ser Phe Leu Gly Gly Ala Pro
            500   505   510
Thr Glu Asp Leu Lys Ala Leu Ser Gln Gln Asn Val Ser Met Asp Leu
        515   520   525

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Ala Thr Phe Met Lys Leu Arg Thr Asp Ala Val Leu Pro Leu Thr Val
    530                 535                 540
Ala Glu Val Gln Lys Leu Leu Gly Pro His Val Glu Gly Leu Lys Ala
545                 550                 555                 560
Glu Glu Arg His Arg Pro Val Arg Asp Trp Ile Leu Arg Gln Arg Gln
                565                 570                 575
Asp Asp Leu Asp Thr Leu Gly Leu Gly Leu Gln Gly Gly Ile Pro Asn
            580                 585                 590
Gly Tyr Leu Val Leu Asp Leu Ser Met Gln Glu Ala Leu Ser Gly Thr
        595                 600                 605
Pro Cys Leu Leu Gly Pro Gly Pro Val Leu Thr Val Leu Ala Leu Leu
    610                 615                 620
Leu Ala Ser Thr Leu Ala
625                 630
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<210> 29
<211> 2135
<212> DNA
<213> Mus musculus

<400> 29

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ggacagctgc tttcccaggc ccaaaagccc cttcgttgtc tccaaacagt ggtgtgggtt      60
gaggggtggg acaagtgggg acctcagagt cattgttatc cacagaccat ggccttgcca     120
acagctcgac ccctgctggg gtcctgtgga agtcccatct gcagccgaag cttcctactg     180
cttctcctta gtcttgggtg gataccacgt ctgcagaccc agactacaaa gacaagccag     240
gaggccacac tcctccatgc tgtgaacggt gccgctgact ttgccagtct ccccacaggc     300
ctctttcttg gcctcacatg tgaggaggta tctgacctga gcatggaaca agccaagggg     360
ctggctatgg ctgtaagaca gaagaacatt acactccggg gacatcagct gcgttgtctg     420
gcacgtcgcc ttcctaggca cctcaccgac gaggaactga atgctcttcc actggacctg     480
ctgctcttcc tcaacccagc catgtttcca gggcaacagg cttgtgccca cttcttctcc     540
ctcatctcta aagccaatgt ggatgtactc ccacggaggt ctctggagcg ccagaggctg     600
ctgatggagg ctctgaagtg ccagggcgtg tatggatttc aagtgagtga ggcagatgtg     660
cgggctctcg gaggcctggc ctgtgacctg cctgggaaat ttgtggccag atcttccgaa     720
gttctcctcc cctggctggc aggatgccaa ggacccctgg accagagcca ggaaaaggca     780
gtcagggagg ttctgaggag tggaagaacc caatatggcc ccccatcgaa gtggtcagtc     840
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atccccaagg atgtcaaagc tgaatggctg caacacatct ccagagaccc ctccaggctg     960
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cctccaggga aggagcccta caaggtggat gaagacctca tcttctacca gaattgggag    1080
ctggaggctt gtgtagatgg caccatgctg gccagacaaa tggaccttgt gaacgagatt    1140
cccttcacct atgagcagct cagtatcttt aagcacaaac tggacaagac ctacccacaa    1200
ggctatcctg agtccctgat ccagcagctg ggtcacttct tcagatatgt tagccctgaa    1260
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gccttccaga atgtgagcgg cctagaatac tttgagaaaa tcaagacatt cctgggtggg    1620
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ctgttccggc agcatcagaa agacctagac aggctgggtt tgggacttca gggtggcatc    1860
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agctgagacc accaccctgc aaggctcctg gtcccagctc tactggggcc ctcttgacca    2040
ggagtgggta ccaggggtca ttgccaaagt ttgaggactc ttgaactcaa taaacagtgg    2100
catatgctcc cttgaaaaaa aaaaaaaaaa aaaaa                               2135
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<210> 30
<211> 625
<212> PRT
<213> Mus musculus

<400> 30

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Met Ala Leu Pro Thr Ala Arg Pro Leu Leu Gly Ser Cys Gly Ser Pro
 1               5                  10                  15
Ile Cys Ser Arg Ser Phe Leu Leu Leu Leu Leu Ser Leu Gly Trp Ile
            20                  25                  30
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Pro Arg Leu Gln Thr Gln Thr Thr Lys Thr Ser Gln Glu Ala Thr Leu
        35                  40                  45
Leu His Ala Val Asn Gly Ala Ala Asp Phe Ala Ser Leu Pro Thr Gly
    50                  55                  60
Leu Phe Leu Gly Leu Thr Cys Glu Glu Val Ser Asp Leu Ser Met Glu
65                  70                  75                  80
Gln Ala Lys Gly Leu Ala Met Ala Val Arg Gln Lys Asn Ile Thr Leu
                85                  90                  95
Arg Gly His Gln Leu Arg Cys Leu Ala Arg Arg Leu Pro Arg His Leu
            100                 105                 110
Thr Asp Glu Glu Leu Asn Ala Leu Pro Leu Asp Leu Leu Leu Phe Leu
        115                 120                 125
Asn Pro Ala Met Phe Pro Gly Gln Gln Ala Cys Ala His Phe Phe Ser
    130                 135                 140
Leu Ile Ser Lys Ala Asn Val Asp Val Leu Pro Arg Arg Ser Leu Glu
145                 150                 155                 160
Arg Gln Arg Leu Leu Met Glu Ala Leu Lys Cys Gln Gly Val Tyr Gly
                165                 170                 175
Phe Gln Val Ser Glu Ala Asp Val Arg Ala Leu Gly Gly Leu Ala Cys
            180                 185                 190
Asp Leu Pro Gly Lys Phe Val Ala Arg Ser Ser Glu Val Leu Leu Pro
        195                 200                 205
Trp Leu Ala Gly Cys Gln Gly Pro Leu Asp Gln Ser Gln Glu Lys Ala
    210                 215                 220
Val Arg Glu Val Leu Arg Ser Gly Arg Thr Gln Tyr Gly Pro Pro Ser
225                 230                 235                 240
Lys Trp Ser Val Ser Thr Leu Asp Ala Leu Gln Ser Leu Val Ala Val
                245                 250                 255
Leu Asp Glu Ser Ile Val Gln Ser Ile Pro Lys Asp Val Lys Ala Glu
            260                 265                 270
Trp Leu Gln His Ile Ser Arg Asp Pro Ser Arg Leu Gly Ser Lys Leu
        275                 280                 285
Thr Val Ile His Pro Arg Phe Arg Arg Asp Ala Glu Gln Lys Ala Cys
    290                 295                 300
Pro Pro Gly Lys Glu Pro Tyr Lys Val Asp Glu Asp Leu Ile Phe Tyr
305                 310                 315                 320
Gln Asn Trp Glu Leu Glu Ala Cys Val Asp Gly Thr Met Leu Ala Arg
                325                 330                 335
Gln Met Asp Leu Val Asn Glu Ile Pro Phe Thr Tyr Glu Gln Leu Ser
            340                 345                 350
Ile Phe Lys His Lys Leu Asp Lys Thr Tyr Pro Gln Gly Tyr Pro Glu
        355                 360                 365
Ser Leu Ile Gln Gln Leu Gly His Phe Phe Arg Tyr Val Ser Pro Glu
    370                 375                 380
Asp Ile His Gln Trp Asn Val Thr Ser Pro Asp Thr Val Lys Thr Leu
385                 390                 395                 400
Leu Lys Val Ser Lys Gly Gln Lys Met Asn Ala Gln Ala Ile Ala Leu
                405                 410                 415
Val Ala Cys Tyr Leu Arg Gly Gly Gly Gln Leu Asp Glu Asp Met Val
            420                 425                 430
Lys Ala Leu Gly Asp Ile Pro Leu Ser Tyr Leu Cys Asp Phe Ser Pro
        435                 440                 445
Gln Asp Leu His Ser Val Pro Ser Ser Val Met Trp Leu Val Gly Pro
    450                 455                 460
Gln Asp Leu Asp Lys Cys Ser Gln Arg His Leu Gly Leu Leu Tyr Gln
465                 470                 475                 480
Lys Ala Cys Ser Ala Phe Gln Asn Val Ser Gly Leu Glu Tyr Phe Glu
                485                 490                 495
Lys Ile Lys Thr Phe Leu Gly Gly Ala Ser Val Lys Asp Leu Arg Ala
            500                 505                 510
Leu Ser Gln His Asn Val Ser Met Asp Ile Ala Thr Phe Lys Arg Leu
        515                 520                 525
Gln Val Asp Ser Leu Val Gly Leu Ser Val Ala Glu Val Gln Lys Leu
    530                 535                 540
Leu Gly Pro Asn Ile Val Asp Leu Lys Thr Glu Glu Asp Lys Ser Pro
545                 550                 555                 560
Val Arg Asp Trp Leu Phe Arg Gln His Gln Lys Asp Leu Asp Arg Leu
                565                 570                 575
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Gly Leu Gly Leu Gln Gly Gly Ile Pro Asn Gly Tyr Leu Val Leu Asp
580 585 590
Phe Asn Val Arg Glu Ala Phe Ser Ser Arg Ala Ser Leu Leu Gly Pro
595 600 605
Gly Phe Val Leu Ile Trp Ile Pro Ala Leu Leu Pro Ala Leu Arg Leu
610 615 620
Ser
625

<210> 31
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic mesothelin peptide

<400> 31
Gly Gln Lys Met Asn Ala Gln Ala Ile
1 5

<210> 32
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> 3D beta peptide clone from Mus musculus

<400> 32
Cys Ala Ser Ser Pro Gly Leu Gly Gly Ser Tyr Glu Gln Tyr Phe
1 5 10 15

<210> 33
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> 3D beta nucleotide clone from Mus musculus

<400> 33
tgtgccagca gccctggact ggggggatcc tatgaacagt acttc 45

<210> 34
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> V beta 10 clone #1 peptide clone from Mus musculus

<400> 34
Cys Ala Ser Ser Gln Gly Leu Gly Ser Ser Tyr Glu Gln Tyr Phe
1 5 10 15

<210> 35
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> V beta 10 clone #1 nucleotide clone from Mus

musculus

<400> 35
tgtgccagca gccagggact ggggagctcc tatgaacagt acttc 45

<210> 36
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> V beta 10 clone #2 peptide from Mus musculus

<400> 36
Cys Ala Ser Ser Tyr Ile Leu Gly Ala Tyr Glu Gln Tyr Phe
1 5 10

<210> 37
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> V beta 10 clone #2 nucleotide from Mus musculus

<400> 37
tgtgccagca gctatatact gggggcctat gaacagtact tc 42

<210> 38
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> V beta 10 clone #3 peptide from Mus musculus

<400> 38
Cys Ala Ser Ser Ser Trp Thr Val Tyr Glu Gln Tyr Phe
1 5 10

<210> 39
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> V beta 10 clone #3 nucleotide from Mus musculus

<400> 39
tgtgccagca gctcctggac agtctatgaa cagtacttc 39

<210> 40
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> V beta 10 clone #4 peptide from Mus musculus

<400> 40
Cys Ala Ser Ser Trp Thr Gly Ala Asn Thr Gly Gln Leu Tyr Phe
1 5 10 15

<210> 41
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> V beta 10 clone #4 nucleotide from Mus musculus

<400> 41
tgtgccagca gctggacagg ggcaaacacc gggcagctct acttt 45

<210> 42
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic mesothelin peptide

<400> 42
Ile Ser Lys Ala Asn Val Asp Val Leu
1 5

<210> 43
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic mesothelin peptide

<400> 43
Gly Gln Lys Met Asn Ala Gln Ala Ile
1 5

<210> 44
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic mesothelin peptide

<400> 44
Ser Ala Phe Gln Asn Val Ser Gly Leu
1 5

<210> 45
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> synthetic mesothelin peptide

<400> 45
Leu Leu Gly Pro Asn Ile Val Asp Leu
 1   5

<210> 46
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic mesothelin peptide

<400> 46
Glu Ile Pro Phe Thr Tyr Glu Gln Leu
 1   5

<210> 47
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic mesothelin peptide

<400> 47
Gly Ile Pro Asn Gly Tyr Leu Val Leu
 1   5

<210> 48
<211> 1595
<212> DNA
<213> Homo sapiens

<400> 48
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tggaaacctg gggtgccttg ggtcaggaca tcaacttgga cattcctagt tttcaaatga 180
gtgatgatat tgacgatata aaatgggaaa aaacttcaga caagaaaaag attgcacaat 240
tcagaaaaga gaaagagact ttcaaggaaa aagatacata taagctattt aaaaatggaa 300
ctctgaaaat taagcatctg aagaccgatg atcaggatat ctacaaggta tcaatatatg 360
atacaaaagg aaaaaatgtg ttggaaaaaa tatttgattt gaagattcaa gagagggtct 420
caaaaccaaa gatctcctgg acttgtatca acacaaccct gacctgtgag gtaatgaatg 480
gaactgaccc cgaattaaac ctgtatcaag atgggaaaca tctaaaactt tctcagaggg 540
tcatcacaca caagtggacc accagcctga gtgcaaaatt caagtgcaca gcagggaaca 600
aagtcagcaa ggaatccagt gtcgagcctg tcagctgtcc agagaaaggt ctggacatct 660
atctcatcat tggcatatgt ggaggaggca gcctcttgat ggtctttgtg gcactgctcg 720
ttttctatat caccaaaagg aaaaaacaga ggagtcggag aaatgatgag gagctggaga 780
caagagccca cagagtagct actgaagaaa ggggccggaa gccccaccaa attccagctt 840
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gcaagaatgg tagaggaccg agcacagaaa tcttagagat ttcttgtccc ctctcaggtc 1380
atgtgtagat gcgataaatc aagtgattgg tgtgcctggg tctcactaca agcagcctat 1440
ctgcttaaga gactctggag tttcttatgt gccctggtgg acacttgccc accatcctgt 1500
gagtaaaagt gaaataaaag ctttgactag aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1560

aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaa 1595

<210> 49
<211> 351
<212> PRT
<213> Homo sapiens

<400> 49
Met Ser Phe Pro Cys Lys Phe Val Ala Ser Phe Leu Leu Ile Phe Asn
 1   5   10   15
Val Ser Ser Lys Gly Ala Val Ser Lys Glu Ile Thr Asn Ala Leu Glu
            20   25   30
Thr Trp Gly Ala Leu Gly Gln Asp Ile Asn Leu Asp Ile Pro Ser Phe
        35   40   45
Gln Met Ser Asp Asp Ile Asp Asp Ile Lys Trp Glu Lys Thr Ser Asp
    50   55   60
Lys Lys Lys Ile Ala Gln Phe Arg Lys Glu Lys Glu Thr Phe Lys Glu
65   70   75   80
Lys Asp Thr Tyr Lys Leu Phe Lys Asn Gly Thr Leu Lys Ile Lys His
                85   90   95
Leu Lys Thr Asp Asp Gln Asp Ile Tyr Lys Val Ser Ile Tyr Asp Thr
            100   105   110
Lys Gly Lys Asn Val Leu Glu Lys Ile Phe Asp Leu Lys Ile Gln Glu
        115   120   125
Arg Val Ser Lys Pro Lys Ile Ser Trp Thr Cys Ile Asn Thr Thr Leu
    130   135   140
Thr Cys Glu Val Met Asn Gly Thr Asp Pro Glu Leu Asn Leu Tyr Gln
145   150   155   160
Asp Gly Lys His Leu Lys Leu Ser Gln Arg Val Ile Thr His Lys Trp
                165   170   175
Thr Thr Ser Leu Ser Ala Lys Phe Lys Cys Thr Ala Gly Asn Lys Val
            180   185   190
Ser Lys Glu Ser Ser Val Glu Pro Val Ser Cys Pro Glu Lys Gly Leu
        195   200   205
Asp Ile Tyr Leu Ile Ile Gly Ile Cys Gly Gly Gly Ser Leu Leu Met
    210   215   220
Val Phe Val Ala Leu Leu Val Phe Tyr Ile Thr Lys Arg Lys Lys Gln
225   230   235   240
Arg Ser Arg Arg Asn Asp Glu Glu Leu Glu Thr Arg Ala His Arg Val
                245   250   255
Ala Thr Glu Glu Arg Gly Arg Lys Pro His Gln Ile Pro Ala Ser Thr
            260   265   270
Pro Gln Asn Pro Ala Thr Ser Gln His Pro Pro Pro Pro Pro Gly His
        275   280   285
Arg Ser Gln Ala Pro Ser His Arg Pro Pro Pro Pro Gly His Arg Val
    290   295   300
Gln His Gln Pro Gln Lys Arg Pro Pro Ala Pro Ser Gly Thr Gln Val
305   310   315   320
His Gln Gln Lys Gly Pro Pro Leu Pro Arg Pro Arg Val Gln Pro Lys
                325   330   335
Pro Pro His Gly Ala Ala Glu Asn Ser Leu Ser Pro Ser Ser Asn
            340   345   350

<210> 50
<211> 1098
<212> DNA
<213> Homo sapiens

<400> 50
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cgcggggagc cccgcttcat cgcagtgggc tacgtggacg acacgcagtt cgtgcggttc 180
gacagcgacg ccgcgagcca gaggatggag ccgcgggcgc cgtggataga gcaggagggt 240
ccggagtatt gggacgggga gacacggaaa gtgaaggccc actcacagac tcaccgagtg 300
gacctgggga ccctgcgcgg ctactacaac cagagcgagg ccggttctca caccctccag 360
atgatgtttg gctgcgacgt ggggtcggac tggcgcttcc tccgcgggta ccaccagtac 420
gcctacgacg gcaaggatta catcgccctg aaagaggacc tgcgctcttg gaccgcggcg 480
gacatggcag ctcagaccac caagcacaag tgggaggcgg cccatgtggc ggagcagttg 540

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gagacgctgc agcgcacgga cgcccccaaa acgcatatga ctcaccacgc tgtctctgac     660
catgaagcca ccctgaggtg ctgggccctg agcttctacc ctgcggagat cacactgacc     720
tggcagcggg atggggagga ccagacccag gacacggagc tcgtggagac caggcctgca     780
ggggatggaa ccttccagaa gtgggcggct gtggtggtgc cttctggaca ggagcagaga     840
tacacctgcc atgtgcagca tgagggtttg cccaagcccc tcaccctgag atgggagccg     900
tcttcccagc ccaccatccc catcgtgggc atcattgctg gcctggttct ctttggagct     960
gtgatcactg gagctgtggt cgctgctgtg atgtggagga ggaagagctc agatagaaaa    1020
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acagcttgta aagtgtga                                                  1098

<210> 51
<211> 365
<212> PRT
<213> Homo sapiens

<400> 51
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Leu Ala Leu Thr Gln Thr Trp Ala Gly Ser His Ser Met Arg Tyr Phe
            20                  25                  30
Phe Thr Ser Val Ser Arg Pro Gly Arg Gly Glu Pro Arg Phe Ile Ala
        35                  40                  45
Val Gly Tyr Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala
    50                  55                  60
Ala Ser Gln Arg Met Glu Pro Arg Ala Pro Trp Ile Glu Gln Glu Gly
65                  70                  75                  80
Pro Glu Tyr Trp Asp Gly Glu Thr Arg Lys Val Lys Ala His Ser Gln
                85                  90                  95
Thr His Arg Val Asp Leu Gly Thr Leu Arg Gly Tyr Tyr Asn Gln Ser
            100                 105                 110
Glu Ala Gly Ser His Thr Leu Gln Met Met Phe Gly Cys Asp Val Gly
        115                 120                 125
Ser Asp Trp Arg Phe Leu Arg Gly Tyr His Gln Tyr Ala Tyr Asp Gly
    130                 135                 140
Lys Asp Tyr Ile Ala Leu Lys Glu Asp Leu Arg Ser Trp Thr Ala Ala
145                 150                 155                 160
Asp Met Ala Ala Gln Thr Thr Lys His Lys Trp Glu Ala Ala His Val
                165                 170                 175
Ala Glu Gln Leu Arg Ala Tyr Leu Glu Gly Thr Cys Val Glu Trp Leu
            180                 185                 190
Arg Arg Tyr Leu Glu Asn Gly Lys Glu Thr Leu Gln Arg Thr Asp Ala
        195                 200                 205
Pro Lys Thr His Met Thr His His Ala Val Ser Asp His Glu Ala Thr
    210                 215                 220
Leu Arg Cys Trp Ala Leu Ser Phe Tyr Pro Ala Glu Ile Thr Leu Thr
225                 230                 235                 240
Trp Gln Arg Asp Gly Glu Asp Gln Thr Gln Asp Thr Glu Leu Val Glu
                245                 250                 255
Thr Arg Pro Ala Gly Asp Gly Thr Phe Gln Lys Trp Ala Ala Val Val
            260                 265                 270
Val Pro Ser Gly Gln Glu Gln Arg Tyr Thr Cys His Val Gln His Glu
        275                 280                 285
Gly Leu Pro Lys Pro Leu Thr Leu Arg Trp Glu Pro Ser Ser Gln Pro
    290                 295                 300
Thr Ile Pro Ile Val Gly Ile Ile Ala Gly Leu Val Leu Phe Gly Ala
305                 310                 315                 320
Val Ile Thr Gly Ala Val Val Ala Ala Val Met Trp Arg Arg Lys Ser
                325                 330                 335
Ser Asp Arg Lys Gly Gly Ser Tyr Ser Gln Ala Ala Ser Ser Asp Ser
            340                 345                 350
Ala Gln Gly Ser Asp Val Ser Leu Thr Ala Cys Lys Val
        355                 360                 365

<210> 52
<211> 987
<212> DNA
<213> Homo sapiens
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<400> 52
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atgtctcgct ccgtggcctt agctgtgctc gcgctactct ctctttctgg cctggaggct 120
atccagcgta ctccaaagat tcaggtttac tcacgtcatc cagcagagaa tggaaagtca 180
aatttcctga attgctatgt gtctgggttt catccatccg acattgaagt tgacttactg 240
aagaatggag agagaattga aaaagtggag cattcagact tgtctttcag caaggactgg 300
tctttctatc tcttgtacta cactgaattc acccccactg aaaaagatga gtatgcctgc 360
cgtgtgaacc atgtgacttt gtcacagccc aagatagtta agtgggatcg agacatgtaa 420
gcagcatcat ggaggtttga agatgccgca tttggattgg atgaattcca aattctgctt 480
gcttgctttt taatattgat atgcttatac acttacactt tatgcacaaa atgtagggtt 540
ataataatgt taacatggac atgatcttct ttataattct actttgagtg ctgtctccat 600
gtttgatgta tctgagcagg ttgctccaca ggtagctcta ggagggctgg caacttagag 660
gtggggagca gagaattctc ttatccaaca tcaacatctt ggtcagattt gaactcttca 720
atctcttgca ctcaaagctt gttaagatag ttaagcgtgc ataagttaac ttccaattta 780
catactctgc ttagaatttg ggggaaaatt tagaaatata attgacagga ttattggaaa 840
tttgttataa tgaatgaaac attttgtcat ataagattca tatttacttc ttatacattt 900
gataaagtaa ggcatggttg tggttaatct ggtttatttt tgttccacaa gttaaataaa 960
tcataaaact tgatgtgtta tctctta 987

<210> 53
<211> 119
<212> PRT
<213> Homo sapiens

<400> 53
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Gly Leu Glu Ala Ile Gln Arg Thr Pro Lys Ile Gln Val Tyr Ser Arg
20 25 30
His Pro Ala Glu Asn Gly Lys Ser Asn Phe Leu Asn Cys Tyr Val Ser
35 40 45
Gly Phe His Pro Ser Asp Ile Glu Val Asp Leu Leu Lys Asn Gly Glu
50 55 60
Arg Ile Glu Lys Val Glu His Ser Asp Leu Ser Phe Ser Lys Asp Trp
65 70 75 80
Ser Phe Tyr Leu Leu Tyr Tyr Thr Glu Phe Thr Pro Thr Glu Lys Asp
85 90 95
Glu Tyr Ala Cys Arg Val Asn His Val Thr Leu Ser Gln Pro Lys Ile
100 105 110
Val Lys Trp Asp Arg Asp Met
115