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<110> SBI Biotech Co., Ltd.

<120> ANTI HUMAN RECEPTOR-TYPE PROTEIN TYROSINE PHOSPHATASE SIGMA ANTIBODY

<130> W6373-000000

<150> JP 2011-101752
<151> 2011-04-28

<160> 102

<170> PatentIn version 3.4

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Thr Trp Asn Lys Lys Gly Lys Lys Val Asn Ser Gln Arg Phe Glu Thr
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Ile Glu Phe Asp Glu Ser Ala Gly Ala Val Leu Arg Ile Gln Pro Leu
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Arg Thr Pro Arg Asp Glu Asn Val Tyr Glu Cys Val Ala Gln Asn Ser
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Gln Ile Glu Ser Ser Glu Glu Thr Asp Gln Gly Lys Tyr Glu Cys Val
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Ala Thr Asn Ser Ala Gly Val Arg Tyr Ser Ser Pro Ala Asn Leu Tyr
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Val Arg Val Arg Arg Val Ala Pro Arg Phe Ser Ile Leu Pro Met Ser
225                 230                 235                 240

His Glu Ile Met Pro Gly Gly Asn Val Asn Ile Thr Cys Val Ala Val
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Gly Ser Pro Met Pro Tyr Val Lys Trp Met Gln Gly Ala Glu Asp Leu
            260                 265                 270

Thr Pro Glu Asp Asp Met Pro Val Gly Arg Asn Val Leu Glu Leu Thr
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Asp Val Lys Asp Ser Ala Asn Tyr Thr Cys Val Ala Met Ser Ser Leu
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Gly Val Ile Glu Ala Val Ala Gln Ile Thr Val Lys Ser Leu Pro Lys
305                 310                 315                 320

Ala Pro Gly Thr Pro Met Val Thr Glu Asn Thr Ala Thr Ser Ile Thr
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Ile Thr Trp Asp Ser Gly Asn Pro Asp Pro Val Ser Tyr Tyr Val Ile
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Glu Tyr Lys Ser Lys Ser Gln Asp Gly Pro Tyr Gln Ile Lys Glu Asp
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Ile Thr Thr Thr Arg Tyr Ser Ile Gly Gly Leu Ser Pro Asn Ser Glu
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Tyr Glu Ile Trp Val Ser Ala Val Asn Ser Ile Gly Gln Gly Pro Pro
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Pro Arg Asn Val Gln Ala Arg Met Leu Ser Ala Thr Thr Met Ile Val
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His Asn Val Asp Asp Ser Leu Leu Thr Thr Val Gly Ser Leu Leu Glu
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Asp Glu Thr Tyr Thr Val Arg Val Leu Ala Phe Thr Ser Val Gly Asp
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Gly Pro Leu Ser Asp Pro Ile Gln Val Lys Thr Gln Gln Gly Val Pro
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His Leu Lys Pro His Thr Phe Tyr Asn Phe Val Leu Thr Asn Arg Gly
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Ser Ser Leu Gly Gly Leu Gln Gln Thr Val Thr Ala Trp Thr Ala Phe
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Leu Pro Pro Thr Phe His Pro Gly Asp Gln Lys Gln Tyr Gly Gly Phe
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Asp Asn Arg Gly Leu Glu Pro Gly His Arg Tyr Val Leu Phe Val Leu
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Ala Val Leu Gln Lys Ser Glu Pro Thr Phe Ala Ala Ser Pro Phe Ser
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Asp Pro Phe Gln Leu Asp Asn Pro Asp Pro Gln Pro Ile Val Asp Gly
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Glu Glu Gly Leu Ile Trp Val Ile Gly Pro Val Leu Ala Val Val Phe
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Ile Ile Cys Ile Val Ile Ala Ile Leu Leu Tyr Lys Asn Lys Pro Asp
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Ser Lys Arg Lys Asp Ser Glu Pro Arg Thr Lys Cys Leu Leu Asn Asn
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Ala Asp Leu Ala Pro His His Pro Lys Asp Pro Val Glu Met Arg Arg
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Ile Asn Phe Gln Thr Pro Gly Met Leu Ser His Pro Pro Ile Pro Ile
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Ala Asp Met Ala Glu His Thr Glu Arg Leu Lys Ala Asn Asp Ser Leu
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Lys Leu Ser Gln Glu Tyr Glu Ser Ile Asp Pro Gly Gln Gln Phe Thr
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Trp Glu His Ser Asn Leu Glu Val Asn Lys Pro Lys Asn Arg Tyr Ala
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Thr Phe  Gly Asp Phe Trp Arg  Met Val Trp Glu Gln  Arg Ser Ala
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Thr Ile  Val Met Met Thr Arg  Leu Glu Glu Lys Ser  Arg Ile Lys
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Cys Asp  Gln Tyr Trp Pro Asn  Arg Gly Thr Glu Thr  Tyr Gly Phe
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Ile Gln  Val Thr Leu Leu Asp  Thr Ile Glu Leu Ala  Thr Phe Cys
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Val Arg  Thr Phe Ser Leu His  Lys Asn Gly Ser Ser  Glu Lys Arg
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Glu Val  Arg Gln Phe Gln Phe  Thr Ala Trp Pro Asp  His Gly Val
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Pro Glu  Tyr Pro Thr Pro Phe  Leu Ala Phe Leu Arg  Arg Val Lys
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Thr Cys  Asn Pro Pro Asp Ala  Gly Pro Ile Val Val  His Cys Ser
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Ala Gly  Val Gly Arg Thr Gly  Cys Phe Ile Val Ile  Asp Ala Met
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Cys Gly  Asn Thr Glu Val Pro  Ala Arg Ser Leu Tyr  Ala Tyr Ile
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Arg Tyr  Gln Tyr Phe Val Val  Asp Pro Met Ala Glu  Tyr Asn Met
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Pro Gln  Tyr Ile Leu Arg Glu  Phe Lys Val Thr Asp  Ala Arg Asp
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Gly Gln  Ser Arg Thr Val Arg  Gln Phe Gln Phe Thr  Asp Trp Pro
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Ile Ser  Val His Cys Ser Ala  Gly Val Gly Arg Thr  Gly Val Phe
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Val Asp  Ile Phe Gln Thr Val  Lys Met Leu Arg Thr  Gln Arg Pro
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<302> Generation and initial analysis of more than 15,000 full-length human and mouse cDNA sequences
<303> Proc. Natl. Acad. Sci. U.S.A.
<304> 99
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Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Ser Asp Thr Tyr Tyr Pro
65                  70                  75                  80

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

Thr Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met
            100                 105                 110

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

Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser Ala Lys Thr Thr
    130                 135                 140

Pro Pro Ser Val Tyr Pro Leu Ala Pro Lys Gly Glu
145                 150                 155
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<210> 27
<211> 5
<212> PRT
<213> Mus musculus

<400> 27

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Ser Tyr Gly Met Ser
1               5
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<210> 28
<211> 17
<212> PRT
<213> Mus musculus

<400> 28

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

Gly

<210> 29
<211> 12
<212> PRT
<213> Mus musculus

<400> 29

Gln Val Tyr Tyr Gly Leu Tyr Trp Tyr Phe Asp Val
1 5 10

<210> 30
<211> 413
<212> DNA
<213> Mus musculus

<400> 30
atggagtcac agattcaggt ctttgtattc gtgtttctct ggttgtctgg tgttgacgga 60

gacattgtga tgacccagtc tcacaaattc atgtccacat cagtaggaga cagggtcagc 120

atcatttgta aggccagtca ggatgtgaat actgctgtag cctggtatca acagaaacca 180

ggacaatctc ctaaattact gatttactcg gcatcctacc ggtacactgg agtccctgat 240

cgcttcactg gcagtggatc tgggacggat ttcactttca ccatcagcag tgtgcaggct 300

gaagacctgg caatttatta ctgtcagcaa cattatagta ctccgtacac gttcggaggg 360

gggaccaagc tggaaataaa acgggctgat gctgcaccaa ctgtatccat caa 413

<210> 31
<211> 137
<212> PRT
<213> Mus musculus

<400> 31

Met Glu Ser Gln Ile Gln Val Phe Val Phe Val Phe Leu Trp Leu Ser
1 5 10 15

Gly Val Asp Gly Asp Ile Val Met Thr Gln Ser His Lys Phe Met Ser
20 25 30

Thr Ser Val Gly Asp Arg Val Ser Ile Ile Cys Lys Ala Ser Gln Asp
35 40 45

Val Asn Thr Ala Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro
50 55 60

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

Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Phe Thr Ile Ser
85 90 95

Ser Val Gln Ala Glu Asp Leu Ala Ile Tyr Tyr Cys Gln Gln His Tyr
100 105 110

Ser Thr Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
115 120 125

Ala Asp Ala Ala Pro Thr Val Ser Ile
130 135

<210> 32
<211> 11
<212> PRT
<213> Mus musculus

<400> 32

Lys Ala Ser Gln Asp Val Asn Thr Ala Val Ala
1 5 10

<210> 33
<211> 7
<212> PRT
<213> Mus musculus

<400> 33

Ser Ala Ser Tyr Arg Tyr Thr
1 5

<210> 34
<211> 7
<212> PRT
<213> Mus musculus

<400> 34

Gln Gln His Tyr Ser Thr Pro
1 5

<210> 35
<211> 1413
<212> DNA
<213> Artificial Sequence

<220>
<223> Anti PTPRS chimera 49F2-30 antibody heavy chain nucleic acid sequence

<400> 35
atgaacttcg ggctcaggtt gattttcctt gccctcattt taaaaggtgt ccagtgtgag 60

gtgcagctgg tggagtctgg gggagactta gtgaagcctg gagggtccct gaaactctcc 120

tgtgcagcct ctggattcat tttcagtagc tatggcatgt cttgggttcg ccagactcca 180

gacaagaggc tggagtgggt cgcaaccatt agtagtggtg gtagtgacac ctattatcca 240

gacagtgtga aggggcgatt caccatctcc agagacaatg ccaacaacac cctgtacctg 300

caaatgagca gtctgaagtc tgaggacaca gccatgtatt actgtgcaag acaggtctac 360

tatggtcttt actggtattt cgatgtctgg ggcgcaggga ccacggtcac cgtctcctca 420

gctagcacca agggcccatc ggtcttcccc ctggcaccct cctccaagag cacctctggg 480

ggcacagcgg ccctgggctg cctggtcaag gactacttcc ccgaaccggt gacggtgtcg 540

tggaactcag gcgccctgac cagcggcgtg cacaccttcc cggctgtcct acagtcctca 600

ggactctact ccctcagcag cgtggtgacc gtgccctcca gcagcttggg cacccagacc 660

tacatctgca acgtgaatca caagcccagc aacaccaagg tggacaagaa agttgagccc 720

aaatcttgtg acaaaactca cacatgccca ccgtgcccag cacctgaact cctgggggga 780

ccgtcagtct tcctcttccc cccaaaaccc aaggacaccc tcatgatctc ccggaccccct 840

gaggtcacat gcgtggtggt ggacgtgagc cacgaagacc ctgaggtcaa gttcaactgg 900

tacgtggacg gcgtggaggt gcataatgcc aagacaaagc cgcgggagga gcagtacaac 960

agcacgtacc gtgtggtcag cgtcctcacc gtcctgcacc aggactggct gaatggcaag 1020

gagtacaagt gcaaggtctc caacaaagcc ctcccagccc ccatcgagaa aaccatctcc 1080

aaagccaaag ggcagccccg agaaccacag gtgtacaccc tgccccatc ccgggatgag 1140

ctgaccaaga accaggtcag cctgacctgc ctggtcaaag gcttctatcc cagcgacatc 1200

gccgtggagt gggagagcaa tgggcagccg gagaacaact acaagaccac gcctcccgtg 1260

ctggactccg acggctcctt cttcctctac agcaagctca ccgtggacaa gagcaggtgg 1320

cagcagggga acgtcttctc atgctccgtg atgcatgagg ctctgcacaa ccactacacg 1380

cagaagagcc tctccctgtc tccgggtaaa tga 1413

<210> 36
<211> 470
<212> PRT
<213> Artificial Sequence

<220>
<223> Anti PTPRS chimera 49F2-30 antibody heavy chain amino acid sequence

<400> 36

Met Asn Phe Gly Leu Arg Leu Ile Phe Leu Ala Leu Ile Leu Lys Gly
1 5 10 15

Val Gln Cys Glu Val Gln Leu Val Glu Ser Gly Gly Asp Leu Val Lys
20 25 30

Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Ile Phe
35 40 45

```
Ser Ser Tyr Gly Met Ser Trp Val Arg Gln Thr Pro Asp Lys Arg Leu
    50                  55                  60

Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Ser Asp Thr Tyr Tyr Pro
65                  70                  75                  80

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

Thr Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met
            100                 105                 110

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

Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser Ala Ser Thr Lys
    130                 135                 140

Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly
145                 150                 155                 160

Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
                165                 170                 175

Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
            180                 185                 190

Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val
        195                 200                 205

Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn
    210                 215                 220

Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro
225                 230                 235                 240

Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
                245                 250                 255

Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
            260                 265                 270

Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
        275                 280                 285

Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
    290                 295                 300

Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
305                 310                 315                 320
```

```
Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
                325                 330                 335

Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
            340                 345                 350

Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
        355                 360                 365

Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn
    370                 375                 380

Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
385                 390                 395                 400

Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
                405                 410                 415

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
            420                 425                 430

Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
        435                 440                 445

Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
    450                 455                 460

Ser Leu Ser Pro Gly Lys
465                 470
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<210> 37
<211> 705
<212> DNA
<213> Artificial Sequence

<220>
<223> Anti PTPRS chimera 49F2-30 antibody light chain nucleic acid sequence

<400> 37

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atggagtcac agattcaggt ctttgtattc gtgtttctct ggttgtctgg tgttgacgga      60

gacattgtga tgacccagtc tcacaaattc atgtccacat cagtaggaga cagggtcagc     120

atcatttgta aggccagtca ggatgtgaat actgctgtag cctggtatca acagaaacca     180

ggacaatctc ctaaattact gatttactcg gcatcctacc ggtacactgg agtccctgat     240

cgcttcactg gcagtggatc tgggacggat ttcactttca ccatcagcag tgtgcaggct     300

gaagacctgg caatttatta ctgtcagcaa cattatagta ctccgtacac gttcggaggg     360

gggaccaagc tggaaataaa acgaactgtg gctgcaccat ctgtcttcat cttcccgcca     420

tctgatgagc agttgaaatc tggaactgcc tctgttgtgt gcctgctgaa taacttctat     480

cccagagagg ccaaagtaca gtggaaggtg gataacgccc tccaatcggg taactcccag     540
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gagagtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg 600

ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc 660

ctgagctcgc ccgtcacaaa gagcttcaac aggggagagt gctag 705

<210> 38
<211> 234
<212> PRT
<213> Artificial Sequence

<220>
<223> Anti PTPRS chimera 49F2-30 antibody light chain amino acid sequence

<400> 38

Met Glu Ser Gln Ile Gln Val Phe Val Phe Val Phe Leu Trp Leu Ser
1 5 10 15

Gly Val Asp Gly Asp Ile Val Met Thr Gln Ser His Lys Phe Met Ser
20 25 30

Thr Ser Val Gly Asp Arg Val Ser Ile Ile Cys Lys Ala Ser Gln Asp
35 40 45

Val Asn Thr Ala Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro
50 55 60

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

Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Phe Thr Ile Ser
85 90 95

Ser Val Gln Ala Glu Asp Leu Ala Ile Tyr Tyr Cys Gln Gln His Tyr
100 105 110

Ser Thr Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
115 120 125

Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln
130 135 140

Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr
145 150 155 160

Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser
165 170 175

Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr
180 185 190

Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys
195 200 205

His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro
210 215 220

Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225 230

<210> 39
<211> 36
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 39
ccaggagagt gggagaggct cttctcagta tggtgg 36

<210> 40
<211> 32
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 40
ggctcaggga aatagccctt gaccaggcat cc 32

<210> 41
<211> 24
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 41
tccagagttc caagtcacag tcac 24

<210> 42
<211> 24
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 42
aggggccagt ggatagactg atgg 24

<210> 43
<211> 471
<212> DNA
<213> Mus musculus

<400> 43
atggagttgg gactgagctg ggtatttctt gtggctcttt tgaatggtgt ccagtgtcag 60

gtgcagcttg tagagaccgg gggaggcttg gtgaggcctg gaaattctct gaaactctcc 120

tgtgttacct cgggattcac tttcagtaac taccggatgc actggcttcg ccagcctcca 180

gggaagaggc tggagtggat tgctgtaatt acagtcaaat ctgataatta tggagcaaat 240

tatgcagagt ctgtgaaagg cagattcact atttcaagag atgattcaaa aagcagtgtc 300

tacctgcaga tgaacagatt aagagaggaa gacactgcca cttattattg tagtagatcg 360

gtctactatg gttacgtcct agcctttgac tactggggcc aaggcaccac tctcacagtc 420

tcctcagcca aaacgacacc cccatctgtc tatccactgg cccctaaggg c 471

<210> 44
<211> 157
<212> PRT
<213> Mus musculus

<400> 44

Met Glu Leu Gly Leu Ser Trp Val Phe Leu Val Ala Leu Leu Asn Gly
1 5 10 15

Val Gln Cys Gln Val Gln Leu Val Glu Thr Gly Gly Gly Leu Val Arg
20 25 30

Pro Gly Asn Ser Leu Lys Leu Ser Cys Val Thr Ser Gly Phe Thr Phe
35 40 45

Ser Asn Tyr Arg Met His Trp Leu Arg Gln Pro Pro Gly Lys Arg Leu
50 55 60

Glu Trp Ile Ala Val Ile Thr Val Lys Ser Asp Asn Tyr Gly Ala Asn
65 70 75 80

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

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

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

Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser Ala Lys
130 135 140

Thr Thr Pro Pro Ser Val Tyr Pro Leu Ala Pro Lys Gly
145 150 155

<210> 45
<211> 5
<212> PRT
<213> Mus musculus

<400> 45

Asn Tyr Arg Met His

1 5

<210> 46
<211> 19
<212> PRT
<213> Mus musculus

<400> 46

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

Val Lys Gly

<210> 47
<211> 12
<212> PRT
<213> Mus musculus

<400> 47

Ser Val Tyr Tyr Gly Tyr Val Leu Ala Phe Asp Tyr
1 5 10

<210> 48
<211> 402
<212> DNA
<213> Mus musculus

<400> 48
atgatgtcct ctgctcagtt ccttggtctc ctgttgctct gttttcaagg taccagatgt 60

gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagagtcacc 120

atcagttgca gggcaagtca ggacattagc aattatttaa actggtatca gcagaaacca 180

gatggaactg ttaaactcct gatctactac acatcaagat tacactcagg agtcccatca 240

aggttcagtg gcagtgggtc tggaacagat tattctctca ccattagcaa cctggagcaa 300

gaagatattg ccacttactt ttgccaacag ggtaatacgc ttccgtggac gttcggtgga 360

ggcaccaagc tggaaatcaa acgggctgat gctgcaccaa ct 402

<210> 49
<211> 134
<212> PRT
<213> Mus musculus

<400> 49

Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Leu Cys Phe Gln
1 5 10 15

Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser
20 25 30

Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp
35 40 45

```
Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val
    50                  55                  60

Lys Leu Leu Ile Tyr Tyr Thr Ser Arg Leu His Ser Gly Val Pro Ser
65                  70                  75                  80

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser
                85                  90                  95

Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn
            100                 105                 110

Thr Leu Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
        115                 120                 125

Ala Asp Ala Ala Pro Thr
    130
```

<210> 50
<211> 11
<212> PRT
<213> Mus musculus

<400> 50

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Arg Ala Ser Gln Asp Ile Ser Asn Tyr Leu Asn
1               5                   10
```

<210> 51
<211> 7
<212> PRT
<213> Mus musculus

<400> 51

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Tyr Thr Ser Arg Leu His Ser
1               5
```

<210> 52
<211> 7
<212> PRT
<213> Mus musculus

<400> 52

```
Gln Gln Gly Asn Thr Leu Pro
1               5
```

<210> 53
<211> 465
<212> DNA
<213> Mus musculus

<400> 53

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atgaacttgg ggctcagctt gattttcctt gtccttgttt taaaaggtgt ccagtgtgaa     60

gtgaagctgg tggagtctgg gggaggctta gtgcagcctg gagggtccct gaaactctcc    120
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tgtgcaacct ctggattcac tttcagtgac tattacatgt attgggttcg ccagactcca 180

gagaagaggc tggagtgggt cgcatacatt agtaatggtg gtggtagcac ctattatcca 240

gacactgtaa agggccgatt caccatctcc agagacaatg ccaagaacac cctgtacctg 300

caaatgagcc gtctgaagtc tgaggacaca gccatgtatt actgtgcaag acatgtttac 360

tacgggagga actatgctat ggactactgg ggtcaaggaa cctcagtcac cgtctcctca 420

gccaaaacaa cacccccatc agtctatcca ctggccccta agggc 465

<210> 54
<211> 155
<212> PRT
<213> Mus musculus

<400> 54

Met Asn Leu Gly Leu Ser Leu Ile Phe Leu Val Leu Val Leu Lys Gly
1 5 10 15

Val Gln Cys Glu Val Lys Leu Val Glu Ser Gly Gly Gly Leu Val Gln
20 25 30

Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Thr Ser Gly Phe Thr Phe
35 40 45

Ser Asp Tyr Tyr Met Tyr Trp Val Arg Gln Thr Pro Glu Lys Arg Leu
50 55 60

Glu Trp Val Ala Tyr Ile Ser Asn Gly Gly Gly Ser Thr Tyr Tyr Pro
65 70 75 80

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

Thr Leu Tyr Leu Gln Met Ser Arg Leu Lys Ser Glu Asp Thr Ala Met
100 105 110

Tyr Tyr Cys Ala Arg His Val Tyr Tyr Gly Arg Asn Tyr Ala Met Asp
115 120 125

Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ala Lys Thr Thr
130 135 140

Pro Pro Ser Val Tyr Pro Leu Ala Pro Lys Gly
145 150 155

<210> 55
<211> 5
<212> PRT
<213> Mus musculus

<400> 55

Asp Tyr Tyr Met Tyr

1 5

<210> 56
<211> 17
<212> PRT
<213> Mus musculus

<400> 56

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

Gly

<210> 57
<211> 12
<212> PRT
<213> Mus musculus

<400> 57

His Val Tyr Tyr Gly Arg Asn Tyr Ala Met Asp Tyr
1 5 10

<210> 58
<211> 465
<212> DNA
<213> Mus musculus

<400> 58
atgaacttgg ggctcagctt gattttcctt gtccttgttt taaaaggtgt ccagtgtgaa 60

gtgaagctgg tggagtctgg gggaggctta gtgcagcctg gagggtccct gaaactctcc 120

tgtgcaacct ctggattcac tttcagtgac tattacatgt attgggttcg ccagactcca 180

gagaagaggc tggagtgggt cgcatacatt agtaatggtg gtggtagcac ctattatcca 240

gacactgtaa agggccgatt caccatctcc agagacaatg ccaagaacac cctgtacctg 300

caaatgagcc gtctgaagtc tgaggacaca gccatgtatt actgtgcaag acatgtttac 360

tacgggagga actatgctat ggactactgg ggtcaaggaa cctcagtcac cgtctcctca 420

gccaaaacaa cacccccatc agtctatcca ctggccccta agggc 465

<210> 59
<211> 155
<212> PRT
<213> Mus musculus

<400> 59

Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Leu Cys Phe Gln
1 5 10 15

Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser
20 25 30

Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp

35 40 45

Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val
50 55 60

Lys Leu Leu Ile Tyr Tyr Thr Ser Arg Leu His Ser Gly Val Pro Ser
65 70 75 80

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser
85 90 95

Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn
100 105 110

Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
115 120 125

Ala Asp Ala Ala Pro Thr Val Ser Ile Phe Pro Pro Ser Ser Glu Gln
130 135 140

Leu Thr Ser Gly Gly Ala Ser Val Val Cys Phe
145 150 155

<210> 60
<211> 11
<212> PRT
<213> Mus musculus

<400> 60

Arg Ala Ser Gln Asp Ile Ser Asn Tyr Leu Asn
1 5 10

<210> 61
<211> 7
<212> PRT
<213> Mus musculus

<400> 61

Tyr Thr Ser Arg Leu His Ser
1 5

<210> 62
<211> 8
<212> PRT
<213> Mus musculus

<400> 62

Gln Gln Gly Asn Thr Leu Pro Tyr
1 5

<210> 63
<211> 458
<212> DNA
<213> Mus musculus

<400> 63
atggaatgta actggatact tccttttatt ctgtcagtaa cttcaggtgt ctactcacag 60

gttcagctcc agcagtctgg ggctgagctg gcaagacctg gggcttcagt gaagttgtcc 120

tgcaaggctt ctggctacac ctttactagc tactggatgc agtgggtaaa acagaggcct 180

ggacagggtc tggaatggat tggggctatt tatcctggag atggtgatac taggtacact 240

cagaagttca agggcaaggc cacattgact gcagataaat cctccagcac agcctacatg 300

caactcagca gcttggcatc tgaggactct gcggtctatt actgtgcaag aaggatttac 360

tacggctatt actatgctat ggactactgg ggtcaaggaa cctcagtcac cgtctcctca 420

gccaaaacga caccccatc tgtctatcca ctggcccc 458

<210> 64
<211> 152
<212> PRT
<213> Mus musculus

<400> 64

Met Glu Cys Asn Trp Ile Leu Pro Phe Ile Leu Ser Val Thr Ser Gly
1 5 10 15

Val Tyr Ser Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Ala Arg
20 25 30

Pro Gly Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Thr Phe
35 40 45

Thr Ser Tyr Trp Met Gln Trp Val Lys Gln Arg Pro Gly Gln Gly Leu
50 55 60

Glu Trp Ile Gly Ala Ile Tyr Pro Gly Asp Gly Asp Thr Arg Tyr Thr
65 70 75 80

Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser
85 90 95

Thr Ala Tyr Met Gln Leu Ser Ser Leu Ala Ser Glu Asp Ser Ala Val
100 105 110

Tyr Tyr Cys Ala Arg Arg Ile Tyr Tyr Gly Tyr Tyr Tyr Ala Met Asp
115 120 125

Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ala Lys Thr Thr
130 135 140

Pro Pro Ser Val Tyr Pro Leu Ala
145 150

<210> 65
<211> 5

<212> PRT
<213> Mus musculus

<400> 65

Ser Tyr Trp Met Gln
1 5

<210> 66
<211> 17
<212> PRT
<213> Mus musculus

<400> 66

Ala Ile Tyr Pro Gly Asp Gly Asp Thr Arg Tyr Thr Gln Lys Phe Lys
1 5 10 15

Gly

<210> 67
<211> 12
<212> PRT
<213> Mus musculus

<400> 67

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

<210> 68
<211> 430
<212> DNA
<213> Mus musculus

<400> 68
atggagacag acacaatcct gctatgggtg ctgctgctct gggttccagg ctccactggt 60

gacattgtgc tgacccaatc tccagcttct ttggctgtgt ctctagggca gagggccacc 120

atctcctgca aggccagcca aagtgttgat tatgatggtg atagttatat gaactggtac 180

caacagaaac caggacagcc acccaaactc ctcatctatg ctgcatccaa tctagaatct 240

gggatcccag ccaggtttag tggcagtggg tctgggacag acttcaccct caacatccat 300

cctgtggagg aggaggatgc tgcaacctat tactgtcagc aaagtaatga ggatcctctc 360

acgttcggtg ctgggaccaa gctggagctg aaacgggctg atgctgcacc aactgtatcc 420

atcaagggcg 430

<210> 69
<211> 143
<212> PRT
<213> Mus musculus

<400> 69

Met Glu Thr Asp Thr Ile Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

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Gly Ser Thr Gly Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala
            20                  25                  30

Val Ser Leu Gly Gln Arg Ala Thr Ile Ser Cys Lys Ala Ser Gln Ser
        35                  40                  45

Val Asp Tyr Asp Gly Asp Ser Tyr Met Asn Trp Tyr Gln Gln Lys Pro
    50                  55                  60

Gly Gln Pro Pro Lys Leu Leu Ile Tyr Ala Ala Ser Asn Leu Glu Ser
65                  70                  75                  80

Gly Ile Pro Ala Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
                85                  90                  95

Leu Asn Ile His Pro Val Glu Glu Glu Asp Ala Ala Thr Tyr Tyr Cys
            100                 105                 110

Gln Gln Ser Asn Glu Asp Pro Leu Thr Phe Gly Ala Gly Thr Lys Leu
        115                 120                 125

Glu Leu Lys Arg Ala Asp Ala Ala Pro Thr Val Ser Ile Lys Gly
    130                 135                 140
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<210> 70
<211> 15
<212> PRT
<213> Mus musculus

<400> 70

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Lys Ala Ser Gln Ser Val Asp Tyr Asp Gly Asp Ser Tyr Met Asn
1               5                   10                  15
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<210> 71
<211> 7
<212> PRT
<213> Mus musculus

<400> 71

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Ala Ala Ser Asn Leu Glu Ser
1               5
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<210> 72
<211> 8
<212> PRT
<213> Mus musculus

<400> 72

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Gln Gln Ser Asn Glu Asp Pro Leu
1               5
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<210> 73
<211> 39

<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 73
tttaagcttg ccgccaccat ggagttggga ctgagctgg 39

<210> 74
<211> 42
<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 74
cgatgggccc ttggtgctag ctgaggagac tgtgagagtg gt 42

<210> 75
<211> 39
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 75
accaagcttg ccgccaccat gatgtcctct gctcagttc 39

<210> 76
<211> 33
<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 76
agccacagtt cgtttgattt ccagcttggt gcc 33

<210> 77
<211> 33
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 77
ctggaaatca aacgaactgt ggctgcacca tct 33

<210> 78
<211> 30
<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 78
aaagaattcc tagcactctc ccctgttgaa 30

<210> 79
<211> 39
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 79
tttaagcttg ccgccaccat gaacttgggg ctcagcttg 39

<210> 80
<211> 42
<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 80
cgatgggccc ttggtgctag ctgaggagac ggtgactgag gt 42

<210> 81
<211> 39
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 81
accaagcttg ccgccaccat gatgtcctct gctcagttc 39

<210> 82
<211> 33
<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 82
agccacagtt cgtttgattt ccagcttggt gcc 33

<210> 83
<211> 33
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 83
ctggaaatca aacgaactgt ggctgcacca tct 33

<210> 84
<211> 30
<212> DNA
<213> Artificial

<220>

<223> reverse primer

<400> 84
aaagaattcc tagcactctc ccctgttgaa 30

<210> 85
<211> 39
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 85
tttaagcttg ccgccaccat ggaatgtaac tggatactt 39

<210> 86
<211> 42
<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 86
cgatgggccc ttggtgctag ctgaggagac ggtgactgag gt 42

<210> 87
<211> 39
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 87
accaagcttg ccgccaccat ggagacagac acaatcctg 39

<210> 88
<211> 33
<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 88
agccacagtt cgtttcagct ccagcttggt ccc 33

<210> 89
<211> 33
<212> DNA
<213> Artificial

<220>
<223> forward primer

<400> 89
ctggagctga aacgaactgt ggctgcacca tct 33

<210> 90
<211> 30

<212> DNA
<213> Artificial

<220>
<223> reverse primer

<400> 90
aaagaattcc tagcactctc ccctgttgaa 30

<210> 91
<211> 1419
<212> DNA
<213> Artificial

<220>
<223> anti-PTPRS chimera 9H5-4 antibody heavy chain nucleic acid sequence

<400> 91
atggagttgg gactgagctg ggtatttctt gtggctcttt tgaatggtgt ccagtgtcag 60

gtgcagcttg tagagaccgg gggaggcttg gtgaggcctg gaaattctct gaaactctcc 120

tgtgttacct cgggattcac tttcagtaac taccggatgc actggcttcg ccagcctcca 180

gggaagaggc tggagtggat tgctgtaatt acagtcaaat ctgataatta tggagcaaat 240

tatgcagagt ctgtgaaagg cagattcact atttcaagag atgattcaaa aagcagtgtc 300

tacctgcaga tgaacagatt aagagaggaa gacactgcca cttattattg tagtagatcg 360

gtctactatg gttacgtcct agcctttgac tactggggcc aaggcaccac tctcacagtc 420

tcctcagcta gcaccaaggg cccatcggtc ttcccctgg caccctcctc caagagcacc 480

tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg 540

gtgtcgtgga actcaggcgc cctgaccagc ggcgtgcaca ccttcccggc tgtcctacag 600

tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacc 660

cagacctaca tctgcaacgt gaatcacaag cccagcaaca ccaaggtgga caagaaagtt 720

gagcccaaat cttgtgacaa aactcacaca tgcccaccgt gcccagcacc tgaactcctg 780

gggggaccgt cagtcttcct cttccccca aaacccaagg acaccctcat gatctcccgg 840

acccctgagg tcacatgcgt ggtggtggac gtgagccacg aagaccctga ggtcaagttc 900

aactggtacg tggacggcgt ggaggtgcat aatgccaaga caaagccgcg ggaggagcag 960

tacaacagca cgtaccgtgt ggtcagcgtc ctcaccgtcc tgcaccagga ctggctgaat 1020

ggcaaggagt acaagtgcaa ggtctccaac aaagccctcc cagccccat cgagaaaacc 1080

atctccaaag ccaaagggca gccccgagaa ccacaggtgt acaccctgcc cccatcccgg 1140

gatgagctga ccaagaacca ggtcagcctg acctgcctgg tcaaaggctt ctatcccagc 1200

gacatcgccg tggagtggga gagcaatggg cagccggaga acaactacaa gaccacgcct 1260

cccgtgctgg actccgacgg ctccttcttc ctctacagca agctcaccgt ggacaagagc 1320

aggtggcagc aggggaacgt cttctcatgc tccgtgatgc atgaggctct gcacaaccac 1380

tacacgcaga agagcctctc cctgtctccg ggtaaatga 1419

<210> 92
<211> 472
<212> PRT
<213> Artificial

<220>
<223> anti-PTPRS chimera 9H5-4 antibody heavy chain amino acid sequence

<400> 92

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Met Glu Leu Gly Leu Ser Trp Val Phe Leu Val Ala Leu Leu Asn Gly
1               5                  10                  15

Val Gln Cys Gln Val Gln Leu Val Glu Thr Gly Gly Gly Leu Val Arg
            20                  25                  30

Pro Gly Asn Ser Leu Lys Leu Ser Cys Val Thr Ser Gly Phe Thr Phe
        35                  40                  45

Ser Asn Tyr Arg Met His Trp Leu Arg Gln Pro Pro Gly Lys Arg Leu
    50                  55                  60

Glu Trp Ile Ala Val Ile Thr Val Lys Ser Asp Asn Tyr Gly Ala Asn
65                  70                  75                  80

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

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

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

Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser Ala Ser
    130                 135                 140

Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr
145                 150                 155                 160

Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro
                165                 170                 175

Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val
            180                 185                 190

His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser
        195                 200                 205

Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile
    210                 215                 220

Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val
```

225 230 235 240

Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala
245 250 255

Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
260 265 270

Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
275 280 285

Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
290 295 300

Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
305 310 315 320

Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
325 330 335

Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala
340 345 350

Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
355 360 365

Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr
370 375 380

Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
385 390 395 400

Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
405 410 415

Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
420 425 430

Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
435 440 445

Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
450 455 460

Ser Leu Ser Leu Ser Pro Gly Lys
465 470

<210> 93
<211> 705
<212> DNA
<213> Artificial

<220>
<223> anti-PTPRS chimera 9H5-4 antibody light chain nucleic acid sequence

<400> 93
atgatgtcct ctgctcagtt ccttggtctc ctgttgctct gttttcaagg taccagatgt 60

gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagagtcacc 120

atcagttgca gggcaagtca ggacattagc aattatttaa actggtatca gcagaaacca 180

gatggaactg ttaaactcct gatctactac acatcaagat tacactcagg agtcccatca 240

aggttcagtg gcagtgggtc tggaacagat tattctctca ccattagcaa cctggagcaa 300

gaagatattg ccacttactt ttgccaacag ggtaatacgc ttccgtggac gttcggtgga 360

ggcaccaagc tggaaatcaa acgaactgtg gctgcaccat ctgtcttcat cttcccgcca 420

tctgatgagc agttgaaatc tggaactgcc tctgttgtgt gcctgctgaa taacttctat 480

cccagagagg ccaaagtaca gtggaaggtg gataacgccc tccaatcggg taactcccag 540

gagagtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg 600

ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc 660

ctgagctcgc ccgtcacaaa gagcttcaac aggggagagt gctag 705

<210> 94
<211> 234
<212> PRT
<213> Artificial

<220>
<223> anti-PTPRS chimera 9H5-4 antibody light chain amino acid sequence

<400> 94

Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Leu Cys Phe Gln
1 5 10 15

Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser
20 25 30

Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp
35 40 45

Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val
50 55 60

Lys Leu Leu Ile Tyr Tyr Thr Ser Arg Leu His Ser Gly Val Pro Ser
65 70 75 80

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser
85 90 95

Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn
100 105 110

```
Thr Leu Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
        115                 120                 125

Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln
    130                 135                 140

Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr
145                 150                 155                 160

Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser
                165                 170                 175

Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr
            180                 185                 190

Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys
        195                 200                 205

His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro
    210                 215                 220

Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225                 230
```

<210> 95
<211> 1413
<212> DNA
<213> Artificial

<220>
<223> anti-PTPRS chimera 13G5-57 antibody heavy chain nucleic acid sequence

<400> 95

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atgaacttgg ggctcagctt gattttcctt gtccttgttt taaaaggtgt ccagtgtgaa     60

gtgaagctgg tggagtctgg gggaggctta gtgcagcctg gagggtccct gaaactctcc    120

tgtgcaacct ctggattcac tttcagtgac tattacatgt attgggttcg ccagactcca    180

gagaagaggc tggagtgggt cgcatacatt agtaatggtg gtggtagcac ctattatcca    240

gacactgtaa agggccgatt caccatctcc agagacaatg ccaagaacac cctgtacctg    300

caaatgagcc gtctgaagtc tgaggacaca gccatgtatt actgtgcaag acatgtttac    360

tacgggagga actatgctat ggactactgg ggtcaaggaa cctcagtcac cgtctcctca    420

gctagcacca agggcccatc ggtcttcccc ctggcaccct cctccaagag cacctctggg    480

ggcacagcgg ccctgggctg cctggtcaag gactacttcc ccgaaccggt gacggtgtcg    540

tggaactcag gcgccctgac cagcggcgtg cacaccttcc cggctgtcct acagtcctca    600

ggactctact ccctcagcag cgtggtgacc gtgccctcca gcagcttggg cacccagacc    660

tacatctgca acgtgaatca caagcccagc aacaccaagg tggacaagaa agttgagccc    720

aaatcttgtg acaaaactca cacatgccca ccgtgcccag cacctgaact cctgggggga    780

ccgtcagtct tcctcttccc cccaaaaccc aaggacaccc tcatgatctc ccggacccct    840
```

gaggtcacat gcgtggtggt ggacgtgagc cacgaagacc ctgaggtcaa gttcaactgg 900

tacgtggacg gcgtggaggt gcataatgcc aagacaaagc cgcgggagga gcagtacaac 960

agcacgtacc gtgtggtcag cgtcctcacc gtcctgcacc aggactggct gaatggcaag 1020

gagtacaagt gcaaggtctc caacaaagcc ctcccagccc ccatcgagaa aaccatctcc 1080

aaagccaaag ggcagccccg agaaccacag gtgtacaccc tgccccatc ccgggatgag 1140

ctgaccaaga accaggtcag cctgacctgc ctggtcaaag gcttctatcc cagcgacatc 1200

gccgtggagt gggagagcaa tgggcagccg gagaacaact acaagaccac gcctcccgtg 1260

ctggactccg acggctcctt cttcctctac agcaagctca ccgtggacaa gagcaggtgg 1320

cagcagggga acgtcttctc atgctccgtg atgcatgagg ctctgcacaa ccactacacg 1380

cagaagagcc tctccctgtc tccgggtaaa tga 1413

<210> 96
<211> 470
<212> PRT
<213> Artificial

<220>
<223> anti-PTPRS chimera 13G5-57 antibody heavy chain amino acid sequence

<400> 96

Met Asn Leu Gly Leu Ser Leu Ile Phe Leu Val Leu Val Leu Lys Gly
1 5 10 15

Val Gln Cys Glu Val Lys Leu Val Glu Ser Gly Gly Gly Leu Val Gln
20 25 30

Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Thr Ser Gly Phe Thr Phe
35 40 45

Ser Asp Tyr Tyr Met Tyr Trp Val Arg Gln Thr Pro Glu Lys Arg Leu
50 55 60

Glu Trp Val Ala Tyr Ile Ser Asn Gly Gly Gly Ser Thr Tyr Tyr Pro
65 70 75 80

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

Thr Leu Tyr Leu Gln Met Ser Arg Leu Lys Ser Glu Asp Thr Ala Met
100 105 110

Tyr Tyr Cys Ala Arg His Val Tyr Tyr Gly Arg Asn Tyr Ala Met Asp
115 120 125

Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ala Ser Thr Lys
130 135 140

```
Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly
145                 150                 155                 160

Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
                165                 170                 175

Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
            180                 185                 190

Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val
        195                 200                 205

Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn
    210                 215                 220

Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro
225                 230                 235                 240

Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
                245                 250                 255

Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
            260                 265                 270

Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
        275                 280                 285

Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
    290                 295                 300

Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
305                 310                 315                 320

Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
                325                 330                 335

Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
            340                 345                 350

Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
        355                 360                 365

Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn
    370                 375                 380

Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
385                 390                 395                 400

Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
                405                 410                 415
```

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
420 425 430

Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
435 440 445

Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
450 455 460

Ser Leu Ser Pro Gly Lys
465 470

<210> 97
<211> 705
<212> DNA
<213> Artificial

<220>
<223> anti-PTPRS chimera 13G5-57 antibody light chain nucleic acid sequence

<400> 97
atgatgtcct ctgctcagtt ccttggtctc ctgttgctct gttttcaagg taccagatgt 60

gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagagtcacc 120

atcagttgca gggcaagtca ggacattagc aattatttaa actggtatca gcagaaacca 180

gatggaactg ttaaactcct gatctactac acatcaagat tacactcagg agtcccatca 240

aggttcagtg gcagtgggtc tggaacagat tattctctca ccattagcaa cctggagcaa 300

gaagatattg ccacttactt ttgccaacag ggtaatacgc ttccgtacac gttcggaggg 360

gggaccaagc tggaaataaa acgaactgtg gctgcaccat ctgtcttcat cttcccgcca 420

tctgatgagc agttgaaatc tggaactgcc tctgttgtgt gcctgctgaa taacttctat 480

cccagagagg ccaaagtaca gtggaaggtg gataacgccc tccaatcggg taactcccag 540

gagagtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg 600

ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc 660

ctgagctcgc ccgtcacaaa gagcttcaac aggggagagt gctag 705

<210> 98
<211> 234
<212> PRT
<213> Artificial

<220>
<223> anti-PTPRS chimera 13G5-57 antibody light chain amino acid sequence

<400> 98

Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Leu Cys Phe Gln
1 5 10 15

Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser
20 25 30

Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp
35 40 45

Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val
50 55 60

Lys Leu Leu Ile Tyr Tyr Thr Ser Arg Leu His Ser Gly Val Pro Ser
65 70 75 80

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser
85 90 95

Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn
100 105 110

Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
115 120 125

Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln
130 135 140

Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr
145 150 155 160

Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser
165 170 175

Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr
180 185 190

Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys
195 200 205

His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro
210 215 220

Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225 230

<210> 99
<211> 1413
<212> DNA
<213> Artificial

<220>
<223> anti-PTPRS chimera 22H8-84 antibody heavy chain nucleic acid sequence

<400> 99
atggaatgta actggatact tccttttatt ctgtcagtaa cttcaggtgt ctactcacag 60

gttcagctcc agcagtctgg ggctgagctg gcaagacctg gggcttcagt gaagttgtcc 120

tgcaaggctt ctggctacac ctttactagc tactggatgc agtgggtaaa acagaggcct 180

ggacagggtc tggaatggat tggggctatt tatcctggag atggtgatac taggtacact 240

cagaagttca agggcaaggc cacattgact gcagataaat cctccagcac agcctacatg 300

caactcagca gcttggcatc tgaggactct gcggtctatt actgtgcaag aaggatttac 360

tacggctatt actatgctat ggactactgg ggtcaaggaa cctcagtcac cgtctcctca 420

gctagcacca agggcccatc ggtcttcccc ctggcaccct cctccaagag cacctctggg 480

ggcacagcgg ccctgggctg cctggtcaag gactacttcc ccgaaccggt gacggtgtcg 540

tggaactcag gcgccctgac cagcggcgtg cacaccttcc cggctgtcct acagtcctca 600

ggactctact ccctcagcag cgtggtgacc gtgccctcca gcagcttggg cacccagacc 660

tacatctgca acgtgaatca caagcccagc aacaccaagg tggacaagaa agttgagccc 720

aaatcttgtg acaaaactca cacatgccca ccgtgcccag cacctgaact cctgggggga 780

ccgtcagtct tcctcttccc cccaaaaccc aaggacaccc tcatgatctc ccggaccccct 840

gaggtcacat gcgtggtggt ggacgtgagc cacgaagacc ctgaggtcaa gttcaactgg 900

tacgtggacg gcgtggaggt gcataatgcc aagacaaagc cgcgggagga gcagtacaac 960

agcacgtacc gtgtggtcag cgtcctcacc gtcctgcacc aggactggct gaatggcaag 1020

gagtacaagt gcaaggtctc caacaaagcc ctcccagccc ccatcgagaa aaccatctcc 1080

aaagccaaag ggcagccccg agaaccacag gtgtacaccc tgccccatc ccgggatgag 1140

ctgaccaaga accaggtcag cctgacctgc ctggtcaaag gcttctatcc cagcgacatc 1200

gccgtggagt gggagagcaa tgggcagccg gagaacaact acaagaccac gcctcccgtg 1260

ctggactccg acggctcctt cttcctctac agcaagctca ccgtggacaa gagcaggtgg 1320

cagcagggga acgtcttctc atgctccgtg atgcatgagg ctctgcacaa ccactacacg 1380

cagaagagcc tctccctgtc tccgggtaaa tga 1413

<210> 100
<211> 470
<212> PRT
<213> Artificial

<220>
<223> anti-PTPRS chimera 22H8-84 antibody heavy chain amino acid sequence

<400> 100

Met Glu Cys Asn Trp Ile Leu Pro Phe Ile Leu Ser Val Thr Ser Gly
1 5 10 15

Val Tyr Ser Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Ala Arg
20 25 30

Pro Gly Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Thr Phe
35 40 45

Thr Ser Tyr Trp Met Gln Trp Val Lys Gln Arg Pro Gly Gln Gly Leu

50 55 60

Glu Trp Ile Gly Ala Ile Tyr Pro Gly Asp Gly Asp Thr Arg Tyr Thr
65 70 75 80

Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser
85 90 95

Thr Ala Tyr Met Gln Leu Ser Ser Leu Ala Ser Glu Asp Ser Ala Val
100 105 110

Tyr Tyr Cys Ala Arg Arg Ile Tyr Tyr Gly Tyr Tyr Tyr Ala Met Asp
115 120 125

Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ala Ser Thr Lys
130 135 140

Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly
145 150 155 160

Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
165 170 175

Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
180 185 190

Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val
195 200 205

Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn
210 215 220

Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro
225 230 235 240

Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
245 250 255

Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
260 265 270

Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
275 280 285

Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
290 295 300

Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
305 310 315 320

Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp

325 330 335

Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
340 345 350

Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
355 360 365

Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn
370 375 380

Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
385 390 395 400

Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
405 410 415

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
420 425 430

Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
435 440 445

Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
450 455 460

Ser Leu Ser Pro Gly Lys
465 470

<210> 101
<211> 717
<212> DNA
<213> Artificial

<220>
<223> anti-PTPRS chimera 22H8-84 antibody light chain nucleic acid sequence

<400> 101
atggagacag acacaatcct gctatgggtg ctgctgctct gggttccagg ctccactggt 60

gacattgtgc tgacccaatc tccagcttct ttggctgtgt ctctagggca gagggccacc 120

atctcctgca aggccagcca aagtgttgat tatgatggtg atagttatat gaactggtac 180

caacagaaac caggacagcc acccaaactc ctcatctatg ctgcatccaa tctagaatct 240

gggatcccag ccaggtttag tggcagtggg tctgggacag acttcaccct caacatccat 300

cctgtggagg aggaggatgc tgcaacctat tactgtcagc aaagtaatga ggatcctctc 360

acgttcggtg ctgggaccaa gctggagctg aaacgaactg tggctgcacc atctgtcttc 420

atcttcccgc catctgatga gcagttgaaa tctggaactg cctctgttgt gtgcctgctg 480

aataacttct atcccagaga ggccaaagta cagtggaagg tggataacgc cctccaatcg 540

ggtaactccc aggagagtgt cacagagcag gacagcaagg acagcaccta cagcctcagc 600

agcaccctga cgctgagcaa agcagactac gagaaacaca aagtctacgc ctgcgaagtc 660

acccatcagg gcctgagctc gcccgtcaca aagagcttca acaggggaga gtgctag 717

<210> 102
<211> 238
<212> PRT
<213> Artificial

<220>
<223> anti-PTPRS chimera 22H8-84 antibody light chain amino acid sequence

<400> 102

Met Glu Thr Asp Thr Ile Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala
20 25 30

Val Ser Leu Gly Gln Arg Ala Thr Ile Ser Cys Lys Ala Ser Gln Ser
35 40 45

Val Asp Tyr Asp Gly Asp Ser Tyr Met Asn Trp Tyr Gln Gln Lys Pro
50 55 60

Gly Gln Pro Pro Lys Leu Leu Ile Tyr Ala Ala Ser Asn Leu Glu Ser
65 70 75 80

Gly Ile Pro Ala Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
85 90 95

Leu Asn Ile His Pro Val Glu Glu Glu Asp Ala Ala Thr Tyr Tyr Cys
100 105 110

Gln Gln Ser Asn Glu Asp Pro Leu Thr Phe Gly Ala Gly Thr Lys Leu
115 120 125

Glu Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
130 135 140

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
145 150 155 160

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
165 170 175

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
180 185 190

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
195 200 205

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
210 215 220

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225 230 235