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<110> Regeneron Pharmaceuticals, Inc.

<120> RECOMBINANT CELL SURFACE CAPTURE PROTEINS

<130> 8600-WO

<150> US 61/726,040
<151> 2012-11-14

<160> 51

<170> PatentIn version 3.5

<210> 1
<211> 195
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<213> Streptococcus

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35 40 45

Lys Thr Phe Thr Val Thr Glu Lys Pro Glu Val Ile Asp Ala Ser Glu
50 55 60

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

Lys Val Phe Lys Gln Tyr Ala Asn Asp Asn Gly Val Asp Gly Glu Trp
100 105 110

Thr Tyr Asp Asp Ala Thr Lys Thr Phe Thr Val Thr Glu Lys Pro Glu
115 120 125

Val Ile Asp Ala Ser Glu Leu Thr Pro Ala Val Thr Thr Tyr Lys Leu
130 135 140

Val Ile Asn Gly Lys Thr Leu Lys Gly Glu Thr Thr Thr Lys Ala Val

145 150 155 160

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

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

Ile Asn Pro Asn Thr Gly His Thr Glu Tyr Asn Gln Lys Phe Lys Asp
50 55 60

Lys Ala Thr Leu Thr Ala Asp Arg Ser Ser Ser Thr Ala Tyr Met Gln
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Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys Ala Arg
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Thr Tyr Ser Gly Ser Ser His Phe Asp Tyr Trp Gly Gln Gly Thr Thr
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Leu

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20 25 30

Asn Asn Gly Asp Thr Phe Leu His Trp Tyr Leu Gln Lys Pro Gly Gln
35 40 45

Ser Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val
50 55 60

Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys
65 70 75 80

Ile Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Phe Cys Ser Gln
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Leu Trp Val Thr Ile
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Trp Ile His Trp Glu Lys Gln Arg Pro Glu Gln Gly Leu Glu Trp Ile
        35                  40                  45

Gly Tyr Ile Asn Pro Asn Thr Gly His Thr Glu Tyr Asn Gln Lys Phe
    50                  55                  60

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

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

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

Thr Thr Leu Ile Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
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Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Thr Pro Val Ser
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Gln Ser Leu Val His Asn Asn Gly Asp Thr Phe Leu His Trp Tyr Leu
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Gln Lys Pro Gly Gln Ser Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn
            180                 185                 190

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

Thr Lys Leu Glu Ile Lys Arg Gly Gly Gly Gly Ser Val Leu Phe Tyr
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Leu Ala Val Gly Ile Met Phe Leu Val Asn Thr Val Leu Trp Val Thr
            260                 265                 270

Ile Arg Lys Glu Leu Lys Arg Lys Lys Lys Trp Asp Leu Glu Ile Ser
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Leu Asp Ser Gly His Glu Lys Lys Val Thr Ser Ser Leu Gln Glu Asp
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Arg His Leu Glu Glu Glu Leu Lys Cys Gln Glu Gln Lys Glu Glu Gln
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Leu Gln Glu Gly Val His Arg Lys Glu Pro Gln Gly Ala Thr
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cctgaacagg gattggaatg gattggatac attaatccta acaccggaca cacagagtat 180

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20 25 30

Leu Glu Ile Ser Leu Asp Ser Gly His Glu Lys Lys Val Thr Ser Ser
35 40 45

Leu Gln Glu Asp Arg His Leu Glu Glu Glu Leu Lys Cys Gln Glu Gln
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Lys Glu Glu Gln Leu Gln Glu Gly Val His Arg Lys Glu Pro Gln Gly

65 70 75 80

Ala Thr

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gatgggcgga gttaggggcg ggactatggt tgctgactaa ttgagatgca tgctttgcat 240

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Ser His Arg Val Ser Cys Glu Ala Ser Gly Phe Thr Phe Ser Asn Ala
20 25 30

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

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

Pro Val Lys Asp Arg Phe Thr Ile Ser Arg Asp Asp Ser Lys Asn Met
65 70 75 80

Leu Phe Leu Gln Met Asp Ser Leu Lys Ile Glu Asp Thr Ala Val Tyr
85 90 95

Phe Cys Thr Thr Ala Asp Phe Trp Ser Ala Tyr Ser Ser Asp Tyr Trp
100 105 110

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

<210> 39
<211> 112
<212> PRT
<213> Homo sapiens

<400> 39

Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly
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Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser
20 25 30

Asn Gly Tyr Asn Tyr Leu Asp Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Ile Tyr Leu Gly Ser Asn Arg Ala Ser Gly Val Pro
50 55 60

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

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

Leu Gln Thr Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110
```

<210> 40
<211> 452
<212> PRT
<213> Homo sapiens

<400> 40

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Glu Val Gln Leu Val Glu Ser Gly Gly Ala Ile Val Lys Pro Gly Gly
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Ser His Arg Val Ser Cys Glu Ala Ser Gly Phe Thr Phe Ser Asn Ala
            20                  25                  30

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

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

Pro Val Lys Asp Arg Phe Thr Ile Ser Arg Asp Asp Ser Lys Asn Met
65                  70                  75                  80

Leu Phe Leu Gln Met Asp Ser Leu Lys Ile Glu Asp Thr Ala Val Tyr
                85                  90                  95

Phe Cys Thr Thr Ala Asp Phe Trp Ser Ala Tyr Ser Ser Asp Tyr Trp
            100                 105                 110

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

Ser Val Tyr Pro Leu Ala Pro Val Cys Gly Asp Thr Thr Gly Ser Ser
    130                 135                 140

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

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

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

Thr Ser Ser Thr Trp Pro Ser Gln Ser Ile Thr Cys Asn Val Ala His
        195                 200                 205

Pro Ala Ser Ser Thr Lys Val Asp Lys Lys Ile Glu Pro Arg Gly Pro
    210                 215                 220

Thr Ile Lys Pro Cys Pro Pro Cys Lys Cys Pro Ala Pro Asn Leu Leu
225                 230                 235                 240

Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Ile Lys Asp Val Leu
                245                 250                 255

Met Ile Ser Leu Ser Pro Ile Val Thr Cys Val Val Val Asp Val Ser
            260                 265                 270

Glu Asp Asp Pro Asp Val Gln Ile Ser Trp Phe Val Asn Asn Val Glu
        275                 280                 285

Val His Thr Ala Gln Thr Gln Thr His Arg Glu Asp Tyr Asn Ser Thr
    290                 295                 300

Leu Arg Val Val Ser Ala Leu Pro Ile Gln His Gln Asp Trp Met Ser
305                 310                 315                 320

Gly Lys Glu Phe Lys Cys Lys Val Asn Asn Lys Asp Leu Pro Ala Pro
                325                 330                 335

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

Val Tyr Val Leu Pro Pro Pro Glu Glu Glu Met Thr Lys Lys Gln Val
        355                 360                 365

Thr Leu Thr Cys Met Val Thr Asp Phe Met Pro Glu Asp Ile Tyr Val
    370                 375                 380
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```
Glu Trp Thr Asn Asn Gly Lys Thr Glu Leu Asn Tyr Lys Asn Thr Glu
385                 390                 395                 400

Pro Val Leu Asp Ser Asp Gly Ser Tyr Phe Met Tyr Ser Lys Leu Arg
                405                 410                 415

Val Glu Lys Lys Asn Trp Val Glu Arg Asn Ser Tyr Ser Cys Ser Val
            420                 425                 430

Val His Glu Gly Leu His Asn His His Thr Thr Lys Ser Phe Ser Arg
        435                 440                 445

Thr Pro Gly Lys
    450
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<210> 41
<211> 219
<212> PRT
<213> Homo sapiens

<400> 41

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

Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser
            20                  25                  30

Asn Gly Tyr Asn Tyr Leu Asp Trp Tyr Leu Gln Lys Pro Gly Gln Ser
        35                  40                  45

Pro Gln Leu Leu Ile Tyr Leu Gly Ser Asn Arg Ala Ser Gly Val Pro
    50                  55                  60

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

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

Leu Gln Thr Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg Ala Asp Ala Ala Pro Thr Val Ser Ile Phe Pro Pro Ser Ser Glu
        115                 120                 125
```

```
Gln Leu Thr Ser Gly Gly Ala Ser Val Val Cys Phe Leu Asn Asn Phe
    130                 135                 140

Tyr Pro Lys Asp Ile Asn Val Lys Trp Lys Ile Asp Gly Ser Glu Arg
145                 150                 155                 160

Gln Asn Gly Val Leu Asn Ser Trp Thr Asp Gln Asp Ser Lys Asp Ser
                165                 170                 175

Thr Tyr Ser Met Ser Ser Thr Leu Thr Leu Thr Lys Asp Glu Tyr Glu
            180                 185                 190

Arg His Asn Ser Tyr Thr Cys Glu Ala Thr His Lys Thr Ser Thr Ser
        195                 200                 205

Pro Ile Val Lys Ser Phe Asn Arg Gly Glu Cys
    210                 215
```

<210> 42
<211> 256
<212> PRT
<213> Homo sapiens

<400> 42

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Met Val Ser Tyr Trp Asp Thr Gly Val Leu Leu Cys Ala Leu Leu Ser
1               5                   10                  15

Cys Leu Leu Leu Thr Gly Ser Ser Ser Gly Gly Pro Gly Asp Lys Thr
            20                  25                  30

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
        35                  40                  45

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
    50                  55                  60

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
65                  70                  75                  80

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
                85                  90                  95

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
            100                 105                 110
```

```
Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
        115                 120                 125

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
    130                 135                 140

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
145                 150                 155                 160

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
                165                 170                 175

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
            180                 185                 190

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
        195                 200                 205

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
    210                 215                 220

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
225                 230                 235                 240

Leu His Asn Arg Phe Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
                245                 250                 255
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<210> 43
<211> 336
<212> PRT
<213> Artificial sequence

<220>
<223> synthetic

<400> 43

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

Ser His Arg Val Ser Cys Glu Ala Ser Gly Phe Thr Phe Ser Asn Ala
            20                  25                  30

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

```
Gly Arg Ile Leu Ser Lys Thr Asp Gly Gly Thr Thr Asp Tyr Ala Ala
    50                  55                  60

Pro Val Lys Asp Arg Phe Thr Ile Ser Arg Asp Asp Ser Lys Asn Met
65                  70                  75                  80

Leu Phe Leu Gln Met Asp Ser Leu Lys Ile Glu Asp Thr Ala Val Tyr
                85                  90                  95

Phe Cys Thr Thr Ala Asp Phe Trp Ser Ala Tyr Ser Ser Asp Tyr Trp
            100                 105                 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly
        115                 120                 125

Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser
    130                 135                 140

Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys
145                 150                 155                 160

Arg Ser Ser Gln Ser Leu Leu His Ser Asn Gly Tyr Asn Tyr Leu Asp
                165                 170                 175

Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Leu
            180                 185                 190

Gly Ser Asn Arg Ala Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly
        195                 200                 205

Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Met Glu Ala Glu Asp
    210                 215                 220

Val Gly Val Tyr Tyr Cys Met Gln Gly Leu Gln Thr Pro Tyr Thr Phe
225                 230                 235                 240

Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly Gly Ser Val Leu
                245                 250                 255

Phe Tyr Leu Ala Val Gly Ile Met Phe Leu Val Asn Thr Val Leu Trp
            260                 265                 270
```

```
Val Thr Ile Arg Lys Glu Leu Lys Arg Lys Lys Lys Trp Asp Leu Glu
        275                 280                 285

Ile Ser Leu Asp Ser Gly His Glu Lys Lys Val Thr Ser Ser Leu Gln
    290                 295                 300

Glu Asp Arg His Leu Glu Glu Glu Leu Lys Cys Gln Glu Gln Lys Glu
305                 310                 315                 320

Glu Gln Leu Gln Glu Gly Val His Arg Lys Glu Pro Gln Gly Ala Thr
                325                 330                 335
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<211> 7633
<212> DNA
<213> Artificial sequence

<220>
<223> synthetic

<400> 44

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taaagccggg ggggtcccat agagtctcct gtgaagcctc tggattcact ttcagtaacg      240

cctggatgag ttgggtccgc caggctccag ggaggggggct ggagtgggtt ggccgtattt      300

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