SEQUENCE LISTING

<110> Regeneron Pharmaceuticals, Inc.
Deshpande, Dipali
Burakov, Darya
Chen, Gang
Fandl, James P.

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<150> US 62/039,416
<151> 2014-08-19

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

His Asn Trp Tyr Pro Ser Arg Val Phe Val Gly Asp Thr Phe Cys Tyr
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Phe Ala Gly Met Thr Phe Ala Val Val Gly Ile Leu Gly His Phe Ser
            260                 265                 270

Lys Thr Met Leu Leu Phe Phe Met Pro Gln Val Phe Asn Phe Leu Tyr
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Ser Leu Pro Gln Leu Leu His Ile Ile Pro Cys Pro Arg His Arg Ile
    290                 295                 300

Pro Arg Leu Asn Ile Lys Thr Gly Lys Leu Glu Met Ser Tyr Ser Lys
305                 310                 315                 320

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

His Asn Trp Tyr Pro Ser Arg Val Phe Val Gly Asp Thr Phe Cys Tyr
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Phe Ala Gly Met Thr Phe Ala Val Val Gly Ile Leu Gly His Phe Ser
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Lys Thr Met Leu Leu Phe Phe Met Pro Gln Val Phe Asn Phe Leu Tyr
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Ser Leu Pro Gln Leu Leu His Ile Ile Pro Cys Pro Arg His Arg Ile
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Ala Glu Ser Leu Arg Leu Val Thr Ile His Gln Ser Asp Thr Glu Asp
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Gly Glu Phe Thr Glu Cys Asn Asn Met Thr Leu Ile Asn Leu Leu Leu
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Lys Ile Phe Gly Pro Ile His Glu Arg Asn Leu Thr Leu Leu Leu Leu
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Leu Glu Ala Gly Gln Ser Leu Val Ile Ser Ala Ser Ile Ile Val Phe
        195                 200                 205

Asn Leu Val Glu Leu Glu Gly Asp Cys Arg Asp Asp His Val Phe Ser
    210                 215                 220

Leu Tyr Phe Met Ile Pro Phe Phe Phe Thr Thr Leu Gly Leu Leu Tyr
225                 230                 235                 240

His Asn Trp Tyr Pro Ser Arg Val Phe Val Gly Asp Thr Phe Cys Tyr
                245                 250                 255

Phe Ala Gly Met Thr Phe Ala Val Val Gly Ile Leu Gly His Phe Ser
            260                 265                 270

Lys Thr Met Leu Leu Phe Phe Met Pro Gln Val Phe Asn Phe Leu Tyr
        275                 280                 285

Ser Leu Pro Gln Leu Leu His Ile Ile Pro Cys Pro Arg His Arg Ile
    290                 295                 300

Pro Arg Leu Asn Ile Lys Thr Gly Lys Leu Glu Met Ser Tyr Ser Lys
305                 310                 315                 320

Phe Lys Thr Lys Ser Leu Ser Phe Leu Gly Thr Phe Ile Leu Lys Val
                325                 330                 335

Ala Glu Ser Leu Gln Leu Val Thr Val His Gln Ser Glu Thr Glu Asp
            340                 345                 350

Gly Glu Phe Thr Glu Cys Asn Asn Met Thr Leu Ile Asn Leu Leu Leu
        355                 360                 365

Lys Ile Leu Gly Pro Ile His Glu Arg Asn Leu Thr Leu Leu Leu Leu
    370                 375                 380

Leu Leu Gln Ile Leu Gly Ser Ala Ile Thr Phe Ser Ile Arg Tyr Gln
385                 390                 395                 400

Leu Val Arg Leu Phe Tyr Asp Val
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<210> 7
<211> 408
<212> PRT
<213> Canis familiaris

<400> 7

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Met Trp Ala Phe Pro Glu Leu Pro Met Pro Leu Leu Val Asn Leu Val
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Gly Ser Leu Leu Gly Phe Val Ala Thr Val Thr Leu Ile Pro Ala Phe
            20                  25                  30

Arg Gly His Phe Ile Ala Ala His Leu Cys Gly Gln Asp Leu Asn Lys
        35                  40                  45

Thr Gly Arg Gln Gln Ile Pro Glu Ser Gln Gly Val Ile Ser Gly Ala
    50                  55                  60

Val Phe Leu Ile Ile Leu Phe Cys Phe Ile Pro Phe Pro Phe Leu Asn
65                  70                  75                  80

Cys Phe Met Glu Glu Gln Cys Lys Ala Phe Pro His His Glu Phe Val
                85                  90                  95

Ala Leu Ile Gly Ala Leu Leu Ala Ile Cys Cys Met Ile Phe Leu Gly
            100                 105                 110

Phe Ala Asp Asp Val Leu Asn Leu Arg Trp Arg His Lys Leu Leu Leu
        115                 120                 125

Pro Thr Ala Ala Ser Leu Pro Leu Leu Met Val Tyr Phe Thr Asn Phe
    130                 135                 140

Gly Asn Thr Thr Ile Val Val Pro Lys Pro Phe Arg Pro Ile Leu Gly
145                 150                 155                 160

Leu His Leu Asp Leu Gly Ile Leu Tyr Tyr Val Tyr Met Gly Leu Leu
                165                 170                 175

Ala Val Phe Cys Thr Asn Ala Ile Asn Ile Leu Ala Gly Ile Asn Gly
            180                 185                 190

Leu Glu Ala Gly Gln Ser Leu Val Ile Ser Ala Ser Ile Ile Val Phe
```

```
        195                 200                 205

Asn Leu Val Glu Leu Glu Gly Asp Tyr Arg Asp Asp His Val Phe Ser
    210                 215                 220

Leu Tyr Phe Met Ile Pro Phe Phe Phe Thr Thr Leu Gly Leu Leu Tyr
225                 230                 235                 240

His Asn Trp Tyr Pro Ser Gln Val Phe Val Gly Asp Thr Phe Cys Tyr
                245                 250                 255

Phe Ala Gly Met Thr Phe Ala Val Val Gly Ile Leu Gly His Phe Ser
            260                 265                 270

Lys Thr Met Leu Leu Phe Phe Met Pro Gln Val Phe Asn Phe Leu Tyr
        275                 280                 285

Ser Leu Pro Gln Leu Leu His Ile Ile Pro Cys Pro Arg His Arg Ile
    290                 295                 300

Pro Arg Leu Asn Thr Lys Thr Gly Lys Leu Glu Met Ser Tyr Ser Lys
305                 310                 315                 320

Phe Lys Thr Lys Ser Leu Ser Phe Leu Gly Asn Phe Ile Leu Lys Val
                325                 330                 335

Ala Ala Ser Leu Gln Leu Val Thr Val His Gln Ser Glu Asn Glu Asp
            340                 345                 350

Gly Ala Phe Thr Glu Cys Asn Asn Met Thr Leu Leu Asn Leu Leu Leu
        355                 360                 365

Lys Val Leu Gly Pro Met His Glu Arg Asn Leu Thr Leu Leu Leu Leu
    370                 375                 380

Leu Leu Gln Ile Leu Gly Ser Ala Val Thr Phe Ser Ile Arg Tyr Gln
385                 390                 395                 400

Leu Val Arg Leu Phe Tyr Asp Val
                405
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<210> 8
<211> 408
<212> PRT

<213> Cavia porcellus

<400> 8

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

Gly Ser Leu Leu Gly Phe Val Ala Thr Leu Thr Leu Ile Pro Ala Phe
            20                  25                  30

Arg Gly His Phe Ile Ala Ala Arg Leu Cys Gly Gln Asp Leu Asn Lys
        35                  40                  45

Thr Asn Arg Gln Gln Ile Pro Glu Ser Gln Gly Val Ile Ser Gly Ala
    50                  55                  60

Val Phe Leu Ile Ile Leu Phe Cys Phe Ile Pro Phe Pro Phe Leu Asn
65                  70                  75                  80

Cys Phe Val Lys Glu Gln Cys Lys Ala Phe Pro His His Glu Phe Val
                85                  90                  95

Ala Leu Ile Gly Ala Leu Leu Ala Ile Cys Cys Met Ile Phe Leu Gly
            100                 105                 110

Phe Ala Asp Asp Val Leu Asn Leu Arg Trp Arg His Lys Leu Leu Leu
        115                 120                 125

Pro Thr Ala Ala Ser Leu Pro Leu Leu Met Val Tyr Phe Thr Asn Phe
    130                 135                 140

Gly Asn Thr Thr Ile Val Val Pro Lys Pro Phe Arg Pro Val Leu Gly
145                 150                 155                 160

Leu His Leu Asp Leu Gly Ile Leu Tyr Tyr Val Tyr Met Gly Leu Leu
                165                 170                 175

Ala Val Phe Cys Thr Asn Ala Ile Asn Ile Leu Ala Gly Ile Asn Gly
            180                 185                 190

Leu Glu Ala Gly Gln Ser Leu Val Ile Ser Ala Ser Ile Ile Val Phe
        195                 200                 205

Asn Leu Val Glu Leu Gln Gly Asp Tyr Arg Asp Asp His Val Phe Ser
    210                 215                 220
```

```
Leu Tyr Phe Met Ile Pro Phe Phe Phe Thr Thr Leu Gly Leu Leu Tyr
225                 230                 235                 240

His Asn Trp Tyr Pro Ser Gln Val Phe Val Gly Asp Thr Phe Cys Tyr
                245                 250                 255

Phe Ala Gly Met Thr Phe Ala Val Val Gly Ile Leu Gly His Phe Ser
            260                 265                 270

Lys Thr Met Leu Leu Phe Phe Met Pro Gln Val Phe Asn Phe Leu Tyr
        275                 280                 285

Ser Leu Pro Gln Leu Leu His Ile Ile Pro Cys Pro Arg His Arg Ile
    290                 295                 300

Pro Arg Leu Asn Thr Lys Thr Gly Lys Leu Glu Met Ser Tyr Ser Lys
305                 310                 315                 320

Phe Lys Thr Asn Ser Leu Ser Phe Leu Gly Thr Phe Ile Leu Lys Val
                325                 330                 335

Ala Glu Arg Leu Gln Leu Val Thr Val His Arg Ser Glu Gly Glu Asp
            340                 345                 350

Gly Ala Phe Thr Glu Cys Asn Asn Met Thr Leu Ile Asn Leu Leu Leu
        355                 360                 365

Lys Ile Phe Gly Pro Ile His Glu Arg Asn Leu Thr Leu Leu Leu Leu
    370                 375                 380

Leu Leu Gln Ile Val Gly Ser Ala Val Thr Phe Ser Ile Arg Tyr Gln
385                 390                 395                 400

Leu Val Arg Leu Phe Tyr Asp Val
                405
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<210> 9
<211> 410
<212> PRT
<213> Rattus norvegicus

<400> 9

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

Leu Ile Gly Ser Leu Leu Gly Phe Val Ala Thr Val Thr Leu Ile Pro
            20                  25                  30

Ala Phe Arg Ser His Phe Ile Ala Ala Arg Leu Cys Gly Gln Asp Leu
        35                  40                  45

Asn Lys Leu Ser Arg Gln Gln Ile Pro Glu Ser Gln Gly Val Ile Ser
    50                  55                  60

Gly Ala Val Phe Leu Ile Ile Leu Phe Cys Phe Ile Pro Phe Pro Phe
65                  70                  75                  80

Leu Asn Cys Phe Val Glu Glu Gln Cys Lys Ala Phe Pro His His Glu
                85                  90                  95

Phe Val Ala Leu Ile Gly Ala Leu Leu Ala Ile Cys Cys Met Ile Phe
            100                 105                 110

Leu Gly Phe Ala Asp Asp Val Leu Asn Leu Arg Trp Arg His Lys Leu
        115                 120                 125

Leu Leu Pro Thr Ala Ala Ser Leu Pro Leu Leu Met Val Tyr Phe Thr
    130                 135                 140

Asn Phe Gly Asn Thr Thr Ile Val Val Pro Lys Pro Phe Arg Trp Ile
145                 150                 155                 160

Leu Gly Leu His Leu Asp Leu Gly Ile Leu Tyr Tyr Val Tyr Met Gly
                165                 170                 175

Leu Leu Ala Val Phe Cys Thr Asn Ala Ile Asn Ile Leu Ala Gly Ile
            180                 185                 190

Asn Gly Leu Glu Ala Gly Gln Ser Leu Val Ile Ser Ala Ser Ile Ile
        195                 200                 205

Val Phe Asn Leu Val Glu Leu Glu Gly Asp Tyr Arg Asp Asp His Val
    210                 215                 220

Phe Ser Leu Tyr Phe Met Met Pro Phe Phe Phe Thr Thr Leu Gly Leu
225                 230                 235                 240
```

```
Leu Tyr His Asn Trp Tyr Pro Ser Gln Val Phe Val Gly Asp Thr Phe
                245                 250                 255

Cys Tyr Phe Ala Gly Met Thr Phe Ala Val Val Gly Ile Leu Gly His
            260                 265                 270

Phe Ser Lys Thr Met Leu Leu Phe Phe Met Pro Gln Val Phe Asn Phe
        275                 280                 285

Leu Tyr Ser Leu Pro Gln Leu Phe Gln Ile Ile Pro Cys Pro Arg His
    290                 295                 300

Arg Met Pro Arg Leu Asn Thr Lys Thr Gly Lys Leu Glu Met Ser Tyr
305                 310                 315                 320

Ser Lys Phe Lys Thr Lys Ser Leu Ser Phe Leu Gly Thr Phe Ile Leu
                325                 330                 335

Lys Val Ala Glu Ser Leu Arg Leu Val Thr Val His Arg Gly Glu Ser
            340                 345                 350

Glu Asp Gly Ala Phe Thr Glu Cys Asn Asn Met Thr Leu Ile Asn Leu
        355                 360                 365

Leu Leu Lys Val Phe Gly Pro Thr His Glu Arg Asn Leu Thr Leu Phe
    370                 375                 380

Leu Leu Leu Leu Gln Val Leu Ser Ser Ala Val Thr Phe Ser Ile Arg
385                 390                 395                 400

Tyr Gln Leu Val Arg Leu Phe Tyr Asp Val
                405                 410
```

<210> 10
<211> 410
<212> PRT
<213> Mus musculus

<400> 10

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Met Trp Ala Phe Pro Glu Leu Pro Leu Pro Leu Pro Leu Leu Val Asn
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Leu Ile Gly Ser Leu Leu Gly Phe Val Ala Thr Val Thr Leu Ile Pro
            20                  25                  30
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```
Ala Phe Arg Ser His Phe Ile Ala Ala Arg Leu Cys Gly Gln Asp Leu
        35                  40                  45

Asn Lys Leu Ser Gln Gln Gln Ile Pro Glu Ser Gln Gly Val Ile Ser
    50                  55                  60

Gly Ala Val Phe Leu Ile Ile Leu Phe Cys Phe Ile Pro Phe Pro Phe
65                  70                  75                  80

Leu Asn Cys Phe Val Glu Glu Gln Cys Lys Ala Phe Pro His His Glu
                85                  90                  95

Phe Val Ala Leu Ile Gly Ala Leu Leu Ala Ile Cys Cys Met Ile Phe
            100                 105                 110

Leu Gly Phe Ala Asp Asp Val Leu Asn Leu Arg Trp Arg His Lys Leu
        115                 120                 125

Leu Leu Pro Thr Ala Ala Ser Leu Pro Leu Leu Met Val Tyr Phe Thr
    130                 135                 140

Asn Phe Gly Asn Thr Thr Ile Val Val Pro Lys Pro Phe Arg Trp Ile
145                 150                 155                 160

Leu Gly Leu His Leu Asp Leu Gly Ile Leu Tyr Tyr Val Tyr Met Gly
                165                 170                 175

Leu Leu Ala Val Phe Cys Thr Asn Ala Ile Asn Ile Leu Ala Gly Ile
            180                 185                 190

Asn Gly Leu Glu Ala Gly Gln Ser Leu Val Ile Ser Ala Ser Ile Ile
        195                 200                 205

Val Phe Asn Leu Val Glu Leu Glu Gly Asp Tyr Arg Asp Asp His Ile
    210                 215                 220

Phe Ser Leu Tyr Phe Met Ile Pro Phe Phe Phe Thr Thr Leu Gly Leu
225                 230                 235                 240

Leu Tyr His Asn Trp Tyr Pro Ser Arg Val Phe Val Gly Asp Thr Phe
                245                 250                 255
```

```
Cys Tyr Phe Ala Gly Met Thr Phe Ala Val Val Gly Ile Leu Gly His
            260                 265                 270

Phe Ser Lys Thr Met Leu Leu Phe Phe Met Pro Gln Val Phe Asn Phe
        275                 280                 285

Leu Tyr Ser Leu Pro Gln Leu Phe His Ile Ile Pro Cys Pro Arg His
    290                 295                 300

Arg Met Pro Arg Leu Asn Ala Lys Thr Gly Lys Leu Glu Met Ser Tyr
305                 310                 315                 320

Ser Lys Phe Lys Thr Lys Asn Leu Ser Phe Leu Gly Thr Phe Ile Leu
                325                 330                 335

Lys Val Ala Glu Asn Leu Arg Leu Val Thr Val His Gln Gly Glu Ser
            340                 345                 350

Glu Asp Gly Ala Phe Thr Glu Cys Asn Asn Met Thr Leu Ile Asn Leu
        355                 360                 365

Leu Leu Lys Val Phe Gly Pro Ile His Glu Arg Asn Leu Thr Leu Leu
    370                 375                 380

Leu Leu Leu Leu Gln Val Leu Ser Ser Ala Ala Thr Phe Ser Ile Arg
385                 390                 395                 400

Tyr Gln Leu Val Arg Leu Phe Tyr Asp Val
                405                 410
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<211> 1920
<212> DNA
<213> Mus musculus

<400> 11

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atttgatcgg ctcgctgttg ggattcgtgg ctacagtcac cctcatccct gccttccgta      300

gccactttat cgccgcgcgc ctctgtggcc aggacctcaa caagctcagc cagcagcaga      360
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<211> 2150
<212> DNA
<213> Homo sapiens

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<211> 1840
<212> DNA
<213> Rattus norvegicus

<400> 13
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<212> DNA
<213> Macaca mulatta

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