Gene: APC - Sequence: NG_008481.4
Transcript: NM_000038.4 - Protein: NP_000029.2
Date : March 2, 2015

1st line: Base numbering. Full stops for intronic +/- 5, 10, 15...
2nd line: Base sequence. lower case Introns, upper case Exons
3rd line: Amino acid sequence. Printed on FIRST base of codon
4th line: Amino acid numbering. Numbered on 1st and increments of 10

Exon 2 | Start: 50339 | End: 50405 | Length: 66

    .   .   .   .
ttgtgctaatccttctgccctgcggacctcccccgactctttactatgcgtgtcaactgc

    .   .   .   .
catcaacttccttgcttgctggggactggggccgcgagggcatacccccgaggggtacgg

    .   .   .   .
ggctagggctaggcaggctgtgcggttgggcggggccctgtgccccactgcggagtgcgg

    .   .   .   .
gtcgggaagcggagagagaagcagctgtgtaatccgctggatgcggaccagggcgctccc

    .   .   .   .
cattcccgtcgggagcccgccgattggctgggtgtgggcgcacgtgaccgacatgtggct

        |-79 |-69 |-59 |-49 |-39 |-29
GTATTGGTGCAGCCCGCCAGGGTGTCACTGGAGACAGAATGGAGGTGCTGCCGGACTCGG

        |-19 .   .   .   .
AAATGGGgtaggtgctggagccaccatggccaggcttgctgcggggggagggggggaaggt

    .   .   .   .
ggttttccctcgcactgtcttaaaccgatggcctttccttggcacagggtccactgcagc

    .   .   .   .
atgccaaacgaggaggcagggcgtcgtcccccgcccccactgcagcactggagatgg

    .   .   .   .
atttcctgtacttcggatccagggttttgacagaagaggaagaagggggaggggtagaa

    .   .   .   .
gtgttaaggggagtctgctgagaaaagctgtttttgaagccagaagggtttttgttttt

    .   .
ataatgc

1

Exon 4 | Start: 67353 | End: 67505 | Length: 152

```
            .        .        .        .        .        .        .        .        .        .        .        .        .
ccttgaagaaattattacttgatagaaagtttaatccatctgtgagaaggcaaatgtatt

            .        .        .        .        .        .        .        .        .        .        .        .        .
cagacacaactaaagttctctcttctattttaatttcatttatcttgaactaagactcca

            .        .        .        .        .        .        .        .        .        .        .        .        .
ctgtttcatcctcttagatgctgctacttgaacaatattgttttgagaccaaaaactagc

            .        .        .        .        .        .        .        .        .        .        .        .        .
atattaacacaattcttcttaaacgtcttaagagttttgtttcctttacccctttcttta

            .        .        .        .        .        .        .        .        .        .        .        .        .
aaaacaagcagccactaaattttttagtagtgaatttcaaaatcctttttaaccttatag

          |-9         |1          |11         |21         |31         |41
GTCCAAGGGTAGCCAAGGATGGCTGCAGCTTCATATGATCAGTTGTTAAAGCAAGTTGAG
                      M   A   A   A   S   Y   D   Q   L   L   K   Q   V   E
                      |1                                      |11

          |51         |61         |71         |81         |91         |101
GCACTGAAGATGGAGAACTCAAATCTTCGACAAGAGCTAGAAGATAATTCCAATCATCTT
A   L   K   M   E   N   S   N   L   R   Q   E   L   E   D   N   S   N   H   L
                      |21                                     |31

          |111        |121        |131        .        .        .        .        .
ACAAAACTGGAAACTGAGGCATCTAATATGAAGgtatcaagactgtgacttttaattgta
T   K   L   E   T   E   A   S   N   M   K
                      |41

     .        .        .        .        .        .        .        .        .        .        .        .        .
gtttatccattttttattcagtattccctcttgtaaacttgaggtaagacactttacttaa

     .        .        .        .        .        .        .        .        .        .        .        .        .
aagtgtattttaaattaagcaataatatgtaaactctttcttgcaaaagttagcatttat

     .        .        .        .        .        .        .        .        .        .        .        .        .
atttttaaataagatatattgaattcattcagtgaatcatataaagaaaataagtgtaaa

     .        .        .        .        .        .        .        .        .        .        .        .        .
actccaatggctagttagttcttagttcttttttaagattaaagagaagagaccaaatata

     .        .        .        .        .        .        .
gcatcactgtactgaggcaaggttttctgtgta
```

2

Exon 5 | Start: 78806 | End: 78890 | Length: 84

```
    .        .        .        .        .        .        .        .        .        .        .        .        .
ctgaaaaatgagaataatttgcattgttggttttttaggtttgaaataatgaatgtatctt

    .        .        .        .        .        .        .        .        .        .        .        .        .
aaatgtgtttctaataccttgcacagagactccccataatcaccattatctcaaaatatc

    .        .        .        .        .        .        .        .        .        .        .        .        .
actattattatttggccatgatttatttattaataatgaataataggtaatatatataag

    .        .        .        .        .        .        .        .        .        .        .        .        .
gtgcgtgctttgagagtgatctgaattttttttctcagcatacttaaatgtcaagaaatac

    .        .        .        .        .        .        .        .        .        .        .        .        .
agaatcatgtcttgaagttatttagaatttcatgttaatatattgtgttctttttaacag

        |141         |151         |161         |171         |181         |191
GAAGTACTTAAACAACTACAAGGAAGTATTGAAGATGAAGCTATGGCTTCTTCTGGACAG
E   V   L   K   Q   L   Q   G   S   I   E   D   E   A   M   A   S   S   G   Q
                |51                                          |61

        |201         |211         .        .        .        .        .        .        .
ATTGATTTATTAGAGCGTCTTAAAGgtagattttaaaaaggtgtttttaaaataatttttt
I   D   L   L   E   R   L   K   E
                |71

        .        .        .        .        .        .        .        .        .        .        .        .
aagctcaaaattgtcatctttaggtgtgtagatccaagtacagcttctctcgatttgggtg

        .        .        .        .        .        .        .        .        .        .        .        .
ttggtatcagttttcttggtatgttagccttaccctcaggatgtaattgttaaagtacaa

        .        .        .        .        .        .        .        .        .        .        .        .
ataaataaaaaatgtatttgtgtgtcatttcttcagttaaacatttaactggctttgaat

        .        .        .        .        .        .        .        .        .        .        .        .
gaactattttaaatccctcccttaaataattttcggctctttgtaaagcttgttgctatt

        .        .        .        .        .        .
ctgccagtcactaaatagggcttta
```

Exon 6 | Start: 79669 | End: 79870 | Length: 201

```
.       .       .       .       .       .       .       .       .       .       .       .
gagaaagtgcttgataataattgaagccagacagagaaattacttttggattctaaaata

.       .       .       .       .       .       .       .       .       .       .       .
ttatttagaggaagtctaaggaagtacattttatctaattttcctttaacacactcctta

.       .       .       .       .       .       .       .       .       .       .       .
tttttaccctgacccaagtggacttttcagggaaagtcctaaataattttgttttcagt

.       .       .       .       .       .       .       .       .       .       .       .
catgtatatttgtggttaaaatgtaaacctaatatttcactttaaaataatataacatta

.       .       .       .       .       .       .       .       .       .       .       .
agaatattttagactgcttaaagcaattgttgtataaaaacttgtttctattttatttag

|221        |231        |241        |251        |261        |271
AGCTTAACTTAGATAGCAGTAATTTCCCTGGAGTAAAACTGCGGTCAAAAATGTCCCTCC
  L   N   L   D   S   S   N   F   P   G   V   K   L   R   S   K   M   S   L   R
                           |81                                      |91

|281        |291        |301        |311        |321        |331
GTTCTTATGGAAGCCGGGAAGGATCTGTATCAAGCCGTTCTGGAGAGTGCAGTCCTGTTC
  S   Y   G   S   R   E   G   S   V   S   S   R   S   G   E   C   S   P   V   P
                           |101                                     |111

|341        |351        |361        |371        |381        |391
CTATGGGTTCATTTCCAAGAAGAGGGTTTGTAAATGGAAGCAGAGAAAGTACTGGATATT
  M   G   S   F   P   R   R   G   F   V   N   G   S   R   E   S   T   G   Y   L
                           |121                                     |131

|401        |411        |421   .       .       .       .       .       .       .
TAGAAGAACTTGAGAAAGAGAGgtaacttttcttcatatagtaaacattgccttgtgtac
  E   E   L   E   K   E   R
                           |141

        .       .       .       .       .       .       .       .       .       .       .       .
tccagtttattgttattttgtaatataatatttaaattgtgaatttatagtaggtgatag

        .       .       .       .       .       .       .       .       .       .       .       .
ctaacacttagagcattttgcatttttaaactcaaagatagcatgttattgattgcactt
```

4

```
     .      .      .      .      .      .      .      .      .      .      .      .
acattaaatctaaaaatataaacaaggccgtttcctgggattctgaagacctattttgtc

     .      .      .      .      .      .      .      .      .      .      .      .
acttattttgtttttttgtttgtttttttggggtttattttgagacagggtgtcactgtgt

     .      .      .      .      .
ctcccaggctggagtgtagtgg
```

Exon 7 | Start: 88109 | End: 88217 | Length: 108

```
      .       .      .       .      .       .      .       .       .       .      .       .
acctatcattatattcttagactataaatatgaagaaagcctttggtgaagtgtaagtat

      .       .      .       .      .       .      .       .       .       .      .       .
tcttttaaggatgattaccagtttatttagaaaaaaagttctttttaatactctaatttt

      .       .      .       .      .       .      .       .       .       .      .       .
aatgactgtaatattctaagtcctacctttaaaaattgaaatcaatgtaaatttttttgag

      .       .      .       .      .       .      .       .       .       .      .       .
taattcattattagcactttaggtagagaagtttgcaataacaactgatgtaagtattgc

      .       .      .       .      .       .      .       .       .       .      .       .
tcttctgcagtctttattagcattgtttaaacgtacctttttttaaaaaaaaaaaaatag

         |431        |441        |451        |461        |471        |481
GTCATTGCTTCTTGCTGATCTTGACAAAGAAGAAAAGGAAAAAGACTGGTATTACGCTCA
  S   L   L   L   A   D   L   D   K   E   E   K   E   K   D   W   Y   Y   A   Q
                                      |151                                     |161

         |491        |501        |511        |521        |531 .         .
ACTTCAGAATCTCACTAAAAGAATAGATAGTCTTCCTTTAACTGAAAATgtaagtaactt
  L   Q   N   L   T   K   R   I   D   S   L   P   L   T   E   N
                                      |171

         .       .      .       .      .       .      .       .       .       .      .       .
ggcagtacaacttatttgaaactttaataacttgatattttaaagtacctaggtaatcca

         .       .      .       .      .       .      .       .       .       .      .       .
ttaaaattcaggataactgaatttatagttatttgtaaattgcaatatgttttacccaac

         .       .      .       .      .       .      .       .       .       .      .       .
tttaggcctgaatatataatagttaatgaattttttgttggtaaagatgataaaactttat

         .       .      .       .      .       .      .       .       .       .      .       .
tgtgctcaaatgtttttatttaaagctcttatttagaaaatctataaagtttgaattctag

         .       .      .       .      .       .      .       .       .       .      .       .
aggacctcagggttcaactaggcaactagttttttaactccgtgtattg
```

Exon 8 | Start: 93270 | End: 93383 | Length: 113

```
      .     .     .     .     .     .     .     .     .     .     .     .
tttaacctcactctaactggaccaattatatattttaagtgaaataggccaatctaatta

      .     .     .     .     .     .     .     .     .     .     .     .
aagccacttgtgactttggcaaataagtgtttgaattccacgtcacatcagggatccaga

      .     .     .     .     .     .     .     .     .     .     .     .
ttgagtctgacacctataatcaaatttaaacactccttggagtaaaaaataattttctca

      .     .     .     .     .     .     .     .     .     .     .     .
tgcaccatgactgacgtatttgcttattcattttctttattggttcttatatgctttttt

      .     .     .     .     .     .     .     .     .     .     .     .
gcttttactgattaacgtaaatacaagatattgatacttttttattatttgtggtttttag

        |541        |551        |561        |571        |581        |591
TTTTCCTTACAAACAGATATGACCAGAAGGCAATTGGAATATGAAGCAAGGCAAATCAGA
F   S   L   Q   T   D   M   T   R   R   Q   L   E   Y   E   A   R   Q   I   R
        |181                                |191

        |601        |611        |621        |631        |641        .
GTTGCGATGGAAGAACAACTAGGTACCTGCCAGGATATGGAAAAACGAGCACAGgtaagt
V   A   M   E   E   Q   L   G   T   C   Q   D   M   E   K   R   A   Q
        |201                                |211

      .     .     .     .     .     .     .     .     .     .     .     .
tacttgtttctaagtgataaaacagcgaagagctattaggaataaaatgaattacagctc

      .     .     .     .     .     .     .     .     .     .     .     .
tgttaatattgattaaattttattaaagacataaggctgtgtttattttggctctatttc

      .     .     .     .     .     .     .     .     .     .     .     .
aaaataagatttatcatggctgctgagcaacataatcaatattcacatagttgtgtcttt

      .     .     .     .     .     .     .     .     .     .     .     .
accatattcatttcccctggtactgttctgttctgccttggaattataagggagagacag

      .     .     .     .     .     .     .     .     .     .     .     .
agttagatggtggtcttccggtagctaatgactagcttcagttctcctttgaaa
```

Exon 9 | Start: 104926 | End: 105009 | Length: 83

```
         .       .       .       .       .       .       .       .       .       .       .       .
tgaggcaaaagaatcacttgaacccggaaggcggaggttgcggtgagctgagattatgcc

         .       .       .       .       .       .       .       .       .       .       .       .
actgcactccagccagggcaacagagcgagactctgtctcgaaaaaaaaagaaaaaaaga

         .       .       .       .       .       .       .       .       .       .       .       .
aaagaaaaattgaactgaccccaatttgttattaaagggtgaatatatttatatgtctag

         .       .       .       .       .       .       .       .       .       .       .       .
ctttttaaatgagaatgatttgacataaccctgagctttttaagtggtagccatagtatga

         .       .       .       .       .       .       .       .       .       .       .       .
ttatttctattaatattattaataaaaacataactaattaggtttcttgtttttattttag
```

```
     |651        |661        |671        |681        |691        |701
CGAAGAATAGCCAGAATTCAGCAAATCGAAAAGGACATACTTCGTATACGACAGCTTTTA
 R   R   I   A   R   I   Q   Q   I   E   K   D   I   L   R   I   R   Q   L   L
             |221                                            |231
```

```
     |711        |721        .       .       .       .       .       .       .
CAGTCCCAAGCAACAGAAGCAGAGgttagtaaattgcctttcttgtttgtgggtataaaa
 Q   S   Q   A   T   E   A   E
             |241
```

```
         .       .       .       .       .       .       .       .       .       .       .       .
ataggtagttattctgagaaaagaaaacatgtataatttaatgtgacaccattgaaatat

         .       .       .       .       .       .       .       .       .       .       .       .
agatgttctttcagagaatttaaataccgtaatttttttcgtgaaattaaattatcaaag

         .       .       .       .       .       .       .       .       .       .       .       .
atttggactattttgattttatctaacttttaggcagttaaaatttataaaactgtaaat

         .       .       .       .       .       .       .       .       .       .       .       .
atagataccttactttagctgtcagtttacatataatcaaatagttaacttaatttggct

         .       .       .       .       .
actatccagtaagtaaactttttt
```

Exon 10 | Start: 113759 | End: 113863 | Length: 104

```
  .    .    .    .    .    .    .    .    .    .    .    .
ggttatgttcctgatagtaatgtgagcgcagctggtagaggatggcattcctgtgagtct

  .    .    .    .    .    .    .    .    .    .    .    .
cagaaaatcctttgtctcgtgcagctctaatgctcaagggacacacttcactttcccctt

  .    .    .    .    .    .    .    .    .    .    .    .
accgagatagtcgaccgccaatcgtactggaggttatgaagtgtaatacacagttccatg

  .    .    .    .    .    .    .    .    .    .    .    .
cctttatcagtctgtataattgatgcattcagagctttaaagcaaaaaaagaaaaaaagc

  .    .    .    .    .    .    .    .    .    .    .    .
cttgggctaagaaagcctacaccattttttgcatgtactgatgttaactccatcttaacag

 |731       |741       |751       |761       |771       |781
AGGTCATCTCAGAACAAGCATGAAACCGGCTCACATGATGCTGAGCGGCAGAATGAAGGT
R   S   S   Q   N   K   H   E   T   G   S   H   D   A   E   R   Q   N   E   G
                        |251                            |261

 |791       |801       |811       |821       |831    .    .    .
CAAGGAGTGGGAGAAATCAACATGGCAACTTCTGGTAATGGTCAGgtaaataaattattt
Q   G   V   G   E   I   N   M   A   T   S   G   N   G   Q
                        |271

       .    .    .    .    .    .    .    .    .    .    .    .
tatcatattttttaaaattatttaaatatcagaaaagtatgaagcaagatggttctaaga

       .    .    .    .    .    .    .    .    .    .    .    .
atgatctataaatcttacctattttcttagtcctgaatgcatatttccagaagcattcag

       .    .    .    .    .    .    .    .    .    .    .    .
taccaatgtgctgtcatttctctttattatatcagcaataatgctgtaaggattttctag

       .    .    .    .    .    .    .    .    .    .    .    .
atctatttctatagctatagattgtgtgtttatgtttttagtctaaaatgattgtgagtag

       .    .    .    .    .    .    .    .    .    .
ttttttttaataactctaagctgcattttgattatgtatatgatt
```

Exon 11 | Start: 127975 | End: 128073 | Length: 98

```
        .       .       .       .       .       .       .       .       .       .       .
tggttttatttatttagatctatgaaaaattactaccctagaatttcttcagtctttggt

        .       .       .       .       .       .       .       .       .       .       .
taagtccattctgcagtttaatgctcatatgcaagaaactctcttttctttagtttttct

        .       .       .       .       .       .       .       .       .       .       .
ctaaaacatacttagtaagcgtataggtaaaaaatattttgaacagttataatggtcata

        .       .       .       .       .       .       .       .       .       .       .
cttttatgatgtatttaattgtttatcatacagacacttcatttggagtaccttaacatg

        .       .       .       .       .       .       .       .       .       .       .
atgttatctgtatttacctatagtctaaattataccatctataatgtgcttaattttttag

        |841        |851        |861        |871        |881        |891
GGTTCAACTACACGAATGGACCATGAAACAGCCAGTGTTTTGAGTTCTAGTAGCACACAC
G   S   T   T   R   M   D   H   E   T   A   S   V   L   S   S   S   S   T   H
        |281                                    |291

        |901        |911        |921        |931   .       .       .       .
TCTGCACCTCGAAGGCTGACAAGTCATCTGGGAACCAAGgtaacagaagattacaaaccc
S   A   P   R   R   L   T   S   H   L   G   T   K
        |301                                    |311

        .       .       .       .       .       .       .       .       .       .       .
tggtcactaatgccatgactactttgctaagacattcttggccaggtgcagtggctcaca

        .       .       .       .       .       .       .       .       .       .       .
cctgtaatcccagcattttgggaggccaaggcaggtggatcacttgaggccaggagttca

        .       .       .       .       .       .       .       .       .       .       .
agaccagcctgggcaacgtggcaaaaccccatctctactaaaaatacaaaaatttagcca

        .       .       .       .       .       .       .       .       .       .       .
gtgtggtggcacacacctgtggtcccagctactcaggaggctgaggcatgagaatagttg

        .       .       .       .       .       .       .
gaacccaggaggcagaggttgcagtgagctgagattaca
```

Exon 12 | Start: 131446 | End: 131824 | Length: 378

```
.     .     .     .     .     .     .     .     .     .     .     .
aggcaaacagcactaacagtttgttagtgagtatgcaaaaacctacttttgcttttaata

.     .     .     .     .     .     .     .     .     .     .     .
ctgtatattaccactcatactatttactcacataaacaaattggtgatgatacatagatt

.     .     .     .     .     .     .     .     .     .     .     .
ttgaaataacactgattacttcatcctggaaaggttttccggttttttgttttttttttg

.     .     .     .     .     .     .     .     .     .     .     .
gcggggggggttgttttgttttttttagagttatagtaaatatcccattcatcacttaatt

.     .     .     .     .     .     .     .     .     .     .     .
ggttttttggcttttggatattaaagtcgtaattttgtttctaaactcatttggcccacag
```

```
        |941        |951        |961        |971        |981        |991
GTGGAAATGGTGTATTCATTGTTGTCAATGCTTGGTACTCATGATAAGGATGATATGTCG
V   E   M   V   Y   S   L   L   S   M   L   G   T   H   D   K   D   D   M   S
                                |321                                    |331

        |1001       |1011       |1021       |1031       |1041       |1051
CGAACTTTGCTAGCTATGTCTAGCTCCCAAGACAGCTGTATATCCATGCGACAGTCTGGA
R   T   L   L   A   M   S   S   S   Q   D   S   C   I   S   M   R   Q   S   G
                                |341                                    |351

        |1061       |1071       |1081       |1091       |1101       |1111
TGTCTTCCTCTCCTCATCCAGCTTTTACATGGCAATGACAAAGACTCTGTATTGTTGGGA
C   L   P   L   L   I   Q   L   L   H   G   N   D   K   D   S   V   L   L   G
                                |361                                    |371

        |1121       |1131       |1141       |1151       |1161       |1171
AATTCCCGGGGCAGTAAAGAGGCTCGGGCCAGGGCCAGTGCAGCACTCCACAACATCATT
N   S   R   G   S   K   E   A   R   A   R   A   S   A   A   L   H   N   I   I
                                |381                                    |391

        |1181       |1191       |1201       |1211       |1221       |1231
CACTCACAGCCTGATGACAAGAGAGGCAGGCGTGAAATCCGAGTCCTTCATCTTTTGGAA
H   S   Q   P   D   D   K   R   G   R   R   E   I   R   V   L   H   L   L   E
                                |401                                    |411
```

11

```
          |1241       |1251       |1261       |1271       |1281       |1291
CAGATACGCGCTTACTGTGAAACCTGTTGGGAGTGGCAGGAAGCTCATGAACCAGGCATG
Q   I   R   A   Y   C   E   T   C   W   E   W   Q   E   A   H   E   P   G   M
                                        |421                         |431

          |1301       |1311 .      .      .      .      .      .      .      .
GACCAGGACAAAAATCCAAgtatgttctctatagtgtacatcgtagtgcatgtttcaaag
D   Q   D   K   N   P   M


       .      .      .      .      .      .      .      .      .      .      .
caaatgtgaaatttttaaacagaaaacatgtttagttaatatgctgtctttatgactaag


       .      .      .      .      .      .      .      .      .      .      .
aggagaaaattcatatcagccatttgtgctactcatatttaaaagattaagtctgtattt


       .      .      .      .      .      .      .      .      .      .      .
ccctagaaaaatttagcaaaggaaaatgttatgtgcactactataagaacagtaagtcaa


       .      .      .      .      .      .      .      .      .      .      .
gagaaatttatacaatcatagcatagtagggccttagtagagctagaaagaacttgagca


       .      .      .      .
attatgttgcccatctttc
```

12

Exon 13 | Start: 134376 | End: 134471 | Length: 95

```
         .        .        .        .        .        .        .        .        .        .        .        .
caacataattttaagttattagctatatgagtaatagcataaacctcctagacttattct

         .        .        .        .        .        .        .        .        .        .        .        .
aagagacttagtcaagggcagatgagtggtaaacatttttatggaaacaaatccctttat

         .        .        .        .        .        .        .        .        .        .        .        .
tcctattttttgttccacatttgtagtatttattcatcctttcagcaaatatttgttgat

         .        .        .        .        .        .        .        .        .        .        .        .
ccactaaaattccgtgaattagggttatattagtgatccctgcatattttttaaagtacaa

         .        .        .        .        .        .        .        .        .        .        .        .
taaacatcattgctcttcaaataacaaagcattatggtttatgttgatttttatttttcag

          |1321       |1331       |1341       |1351       |1361       |1371
TGCCAGCTCCTGTTGAACATCAGATCTGTCCTGCTGTGTGTGTTCTAATGAAACTTTCAT
   P  A  P  V  E  H  Q  I  C  P  A  V  C  V  L  M  K  L  S  F
          |441                                    |451

          |1381       |1391       |1401       .        .        .        .
TTGATGAAGAGCATAGACATGCAATGAATGAACTAGgtaagacaaaaatgttttttaatg
   D  E  E  H  R  H  A  M  N  E  L  G
          |461

         .        .        .        .        .        .        .        .        .        .        .        .
acatagacaattactggtggattttttaaatcatggtagaaattcagtatagtaaataaag

         .        .        .        .        .        .        .        .        .        .        .        .
atttttaatcattgatgaattaggatataaggccaccaacttctgttatcagctgcttcc

         .        .        .        .        .        .        .        .        .        .        .        .
tctgtgtagcaaaaaattgtaccctggtttccagcatagaaaggatcctgaatcacagaa

         .        .        .        .        .        .        .        .        .        .        .        .
actgctaccctgtcataagctaactttttcaaaatcgaagccggagattgaaaaaaaatg

         .        .        .        .        .        .        .
acaaaatgggtcactctttgtcccttttgccaaagt
```

Exon 14 | Start: 139588 | End: 139727 | Length: 139

```
 .         .         .         .         .         .         .         .         .         .         .         .         .
cactgttggcaaggtgcagtgtatatgcagtaaatagaaaataattatttcgctcagcaa

 .         .         .         .         .         .         .         .         .         .         .         .         .
gataaggggctgggggtggagaaactggcataaaatggaataattgtcagttgtacttta

 .         .         .         .         .         .         .         .         .         .         .         .         .
taaatatattatacagaagttctttataacagttttttgtagcttataattctaaaggcaa

 .         .         .         .         .         .         .         .         .         .         .         .         .
atttaaaccatatattctcattgattgagttttttttttcctagtatttaagttaccaact

 .         .         .         .         .         .         .         .         .         .         .         .         .
tggtaccagtttgttttattttagatgattgtctttttcctcttgccctttttaaattag
```

```
   |1411      |1421      |1431      |1441      |1451      |1461
GGGGACTACAGGCCATTGCAGAATTATTGCAAGTGGACTGTGAAATGTATGGGCTTACTA
  G  L  Q  A  I  A  E  L  L  Q  V  D  C  E  M  Y  G  L  T  N
  |471                              |481
```

```
   |1471      |1481      |1491      |1501      |1511      |1521
ATGACCACTACAGTATTACACTAAGACGATATGCTGGAATGGCTTTGACAAACTTGACTT
  D  H  Y  S  I  T  L  R  R  Y  A  G  M  A  L  T  N  L  T  F
  |491                              |501
```

```
   |1531      |1541         .         .         .         .         .         .         .         .
TTGGAGATGTAGCCAACAAGgtatgtttttataacatgtatttcttaagatagctcaggt
  G  D  V  A  N  K
  |511
```

```
      .         .         .         .         .         .         .         .         .         .         .         .
atgagttaatttactttcatacaaatacattttactgattttctttttttttcactctcct

      .         .         .         .         .         .         .         .         .         .         .         .
cattaaacaatgactgataaaaacctgtgcttcacattcgcttatctttactcatttgtt

      .         .         .         .         .         .         .         .         .         .         .         .
tgtcttatgcctaaacaaaggcaaaggtacatctacagatggaacacagtagtgaattta

      .         .         .         .         .         .         .         .         .         .         .         .
tgtaattgcattaaaaacaccattcataagaatatacttgtagggatcatttctgtgatc

      .         .         .         .
cattactagagaagtttaac
```

Exon 15 | Start: 140409 | End: 140486 | Length: 77

```
        .         .         .         .         .         .         .         .         .         .         .         .
tgttacacacacattgattccatccaaataagaggctttactctaaaacctgttgcttat

        .         .         .         .         .         .         .         .         .         .         .         .
catttctcaccacttattcactttatttctctagtttgacaaaggaagaacagatagcaa

        .         .         .         .         .         .         .         .         .         .         .         .
agaattaggagaatatttgtcttttatttaggtaatcttattctagattttttatgagtg

        .         .         .         .         .         .         .         .         .         .         .         .
aagtatcagttatgattaaaacaaaataatgaaaactgaattagacatttagtagccaaa

        .         .         .         .         .         .         .         .         .         .         .         .
aataaagcttggcttcaagttgtctttttaatgatcctctattctgtatttaatttacag

    |1551      |1561      |1571      |1581      |1591      |1601
GCTACGCTATGCTCTATGAAAGGCTGCATGAGAGCACTTGTGGCCCAACTAAAATCTGAA
A   T   L   C   S   M   K   G   C   M   R   A   L   V   A   Q   L   K   S   E
            |521                                 |531

    |1611      |1621      .         .         .         .         .         .         .         .
AGTGAAGACTTACAGCAGgtactatttagaatttcacctgttttttctttttttctcttttt
S   E   D   L   Q   Q
            |541

        .         .         .         .         .         .         .         .         .         .         .         .
ctttgaggcagggtctcactctgtcacccaggcttagagggcagttgtgcaatctcagct

        .         .         .         .         .         .         .         .         .         .         .         .
cactgcaacctctgcctccagggttcaagcaatcctcccacttcagcctctcgaggctgg

        .         .         .         .         .         .         .         .         .         .         .         .
gcctacaggtgcacaccaccatgccaaacgaattttttgtattttttatagagacggggtt

        .         .         .         .         .         .         .         .         .         .         .         .
tcaccacacctgggctcaagcaatctgcccacctcagcatctcaaaatgctgggattaca

        .         .         .         .
ggcgtgtgccaccacacc
```

15

Exon 16 | Start: 141336 | End: 141452 | Length: 116

```
    .      .      .      .      .      .      .      .      .      .      .      .
tgcttcagcctcccaagtagctagaactactgcaggcgcatgccaccatgcccagctaat

    .      .      .      .      .      .      .      .      .      .      .      .
ttttaaaaagttttcatagagacagggtctcactgtgttacccagaaggtcttgaactcc

    .      .      .      .      .      .      .      .      .      .      .      .
tggtctcaggagatcctcctgcctcagcctcccaaagtgataggattacaggcgtgagtc

    .      .      .      .      .      .      .      .      .      .      .      .
accacggctagccagaatttctttcttaatagatttctattcttactgctagcattaaaa

    .      .      .      .      .      .      .      .      .      .      .      .
acaaaaaagcaactagtatgattttatgtataaattaatctaaaattgattaatttgcag

    |1631      |1641      |1651      |1661      |1671      |1681
GTTATTGCGAGTGTTTTGAGGAATTTGTCTTGGCGAGCAGATGTAAATAGTAAAAAGACG
V   I   A   S   V   L   R   N   L   S   W   R   A   D   V   N   S   K   K   T
                 |551                                          |561

    |1691      |1701      |1711      |1721      |1731      |1741
TTGCGAGAAGTTGGAAGTGTGAAAGCATTGATGGAATGTGCTTTAGAAGTTAAAAAGgta
L   R   E   V   G   S   V   K   A   L   M   E   C   A   L   E   V   K   K
                 |571                                          |581

       .      .      .      .      .      .      .      .      .      .      .      .
cctttgaaaacatttagtactataatatgaatttcatgtttggctttttttttgctgcctt

       .      .      .      .      .      .      .      .      .      .      .      .
cttttagccatgagatttcctaatttcttacctgtgtattattcagtactataatatgaa

       .      .      .      .      .      .      .      .      .      .      .      .
tttcatgtttagcttttttttgctgccttctttttagccatgagattccctaatttctttttt

       .      .      .      .      .      .      .      .      .      .      .      .
tgagatggggtctctttctctcgcccaggctggagtgcagtggtctgatcttggctcact

       .      .      .      .      .      .      .      .      .      .      .      .
gcaacctccgtctcccatgttcaagtgattctcctgcctcagcctcctgagtagctg
```

Exon 17 | Start: 147431 | End: 147645 | Length: 214

.   .   .   .
atgcacatcagttgtgcctcatattctaagatgtgtgtactatctaaacacttagaataa

.   .   .   .
agtttataaaagtcattagttaaatattgtgttctgcttgttttatagagatatcactga

.   .   .   .
tataaatactatttggtatttttatgaacattttctaaatggaaagttcttaatttacca

.   .   .   .
gtgagggacgggcaataggatagattaaaaaatagcttttattcaatatcagtaacatag

.   .   .   .
aagttaatgagagacaaattccaactctaattagatgacccatattctgtttcttactag

```
        |1751      |1761      |1771      |1781      |1791      |1801
GAATCAACCCTCAAAAGCGTATTGAGTGCCTTATGGAATTTGTCAGCACATTGCACTGAG
E   S   T   L   K   S   V   L   S   A   L   W   N   L   S   A   H   C   T   E
                                |591                              |601

        |1811      |1821      |1831      |1841      |1851      |1861
AATAAAGCTGATATATGTGCTGTAGATGGTGCACTTGCATTTTTGGTTGGCACTCTTACT
N   K   A   D   I   C   A   V   D   G   A   L   A   F   L   V   G   T   L   T
                                |611                              |621

        |1871      |1881      |1891      |1901      |1911      |1921
TACCGGAGCCAGACAAACACTTTAGCCATTATTGAAAGTGGAGGTGGGATATTACGGAAT
Y   R   S   Q   T   N   T   L   A   I   I   E   S   G   G   G   I   L   R   N
                                |631                              |641

        |1931      |1941      |1951      .       .       .       .       .
GTGTCCAGCTTGATAGCTACAAATGAGGACCACAGgtatatatagagttttatattactt
V   S   S   L   I   A   T   N   E   D   H   R
                                |651
```

    .   .   .   .
ttaaagtacagaattcatactctcaaaaagacctaattgtaagcaatgtttttatataatc

    .   .   .   .
atgaaagttttaagccaaaatatatttattactgtgaaaagataactactaactcttagt

```
       .     .     .     .     .     .     .     .     .     .     .     .
ttaactcattagtgtacttaatgtaataacagtttatagtattatagaggagactaaatt

       .     .     .     .     .     .     .     .     .     .     .     .
aagcaaattatagttgagaggtgtagcccataggtggaggaaaaaatagtcacaaatatt

       .     .     .     .     .     .     .
gtaacaaaataatccatttctattagtatagtata
```

Exon 18 | Start: 150033 | End: 158719 | Length: 8686

```
.     .     .     .     .     .     .     .     .     .     .     .
tgttatatgaatagagtaaatgtatgtgccccacccctgcaaatgttttaagctattgg

.     .     .     .     .     .     .     .     .     .     .     .
gtcagaataggaaatgtagaattgacaaaaaataacacctttactttttttagtgtgaca

.     .     .     .     .     .     .     .     .     .     .     .
gattagtactttaaaacattaaacattacatgaaattagaacaaaaggagatgtggaata

.     .     .     .     .     .     .     .     .     .     .     .
cttggaatttataggataattggtacaatcatattatgccttttgtcttctatccttta

.     .     .     .     .     .     .     .     .     .     .     .
tttgttgttactgcatacacattgtgaccttaattttgtgatctcttgattttatttcag

    |1961      |1971      |1981      |1991      |2001      |2011
GCAAATCCTAAGAGAGAACAACTGTCTACAAACTTTATTACAACACTTAAAATCTCATAG
  Q   I   L   R   E   N   N   C   L   Q   T   L   L   Q   H   L   K   S   H   S
                          |661                                      |671

    |2021      |2031      |2041      |2051      |2061      |2071
TTTGACAATAGTCAGTAATGCATGTGGAACTTTGTGGAATCTCTCAGCAAGAAATCCTAA
  L   T   I   V   S   N   A   C   G   T   L   W   N   L   S   A   R   N   P   K
                          |681                                      |691

    |2081      |2091      |2101      |2111      |2121      |2131
AGACCAGGAAGCATTATGGGACATGGGGGCAGTTAGCATGCTCAAGAACCTCATTCATTC
  D   Q   E   A   L   W   D   M   G   A   V   S   M   L   K   N   L   I   H   S
                          |701                                      |711

    |2141      |2151      |2161      |2171      |2181      |2191
AAAGCACAAAATGATTGCTATGGGAAGTGCTGCAGCTTTAAGGAATCTCATGGCAAATAG
  K   H   K   M   I   A   M   G   S   A   A   A   L   R   N   L   M   A   N   R
                          |721                                      |731

    |2201      |2211      |2221      |2231      |2241      |2251
GCCTGCGAAGTACAAGGATGCCAATATTATGTCTCCTGGCTCAAGCTTGCCATCTCTTCA
  P   A   K   Y   K   D   A   N   I   M   S   P   G   S   S   L   P   S   L   H
                          |741                                      |751
```

```
       |2261      |2271      |2281      |2291      |2301      |2311
TGTTAGGAAACAAAAAGCCCTAGAAGCAGAATTAGATGCTCAGCACTTATCAGAAACTTT
  V  R  K  Q  K  A  L  E  A  E  L  D  A  Q  H  L  S  E  T  F
                            |761                           |771

       |2321      |2331      |2341      |2351      |2361      |2371
TGACAATATAGACAATTTAAGTCCCAAGGCATCTCATCGTAGTAAGCAGAGACACAAGCA
  D  N  I  D  N  L  S  P  K  A  S  H  R  S  K  Q  R  H  K  Q
                            |781                           |791

       |2381      |2391      |2401      |2411      |2421      |2431
AAGTCTCTATGGTGATTATGTTTTTGACACCAATCGACATGATGATAATAGGTCAGACAA
  S  L  Y  G  D  Y  V  F  D  T  N  R  H  D  D  N  R  S  D  N
                            |801                           |811

       |2441      |2451      |2461      |2471      |2481      |2491
TTTTAATACTGGCAACATGACTGTCCTTTCACCATATTTGAATACTACAGTGTTACCCAG
  F  N  T  G  N  M  T  V  L  S  P  Y  L  N  T  T  V  L  P  S
                            |821                           |831

       |2501      |2511      |2521      |2531      |2541      |2551
CTCCTCTTCATCAAGAGGAAGCTTAGATAGTTCTCGTTCTGAAAAAGATAGAAGTTTGGA
  S  S  S  S  R  G  S  L  D  S  S  R  S  E  K  D  R  S  L  E
                            |841                           |851

       |2561      |2571      |2581      |2591      |2601      |2611
GAGAGAACGCGGAATTGGTCTAGGCAACTACCATCCAGCAACAGAAAATCCAGGAACTTC
  R  E  R  G  I  G  L  G  N  Y  H  P  A  T  E  N  P  G  T  S
                            |861                           |871

       |2621      |2631      |2641      |2651      |2661      |2671
TTCAAAGCGAGGTTTGCAGATCTCCACCACTGCAGCCCAGATTGCCAAAGTCATGGAAGA
  S  K  R  G  L  Q  I  S  T  T  A  A  Q  I  A  K  V  M  E  E
                            |881                           |891

       |2681      |2691      |2701      |2711      |2721      |2731
AGTGTCAGCCATTCATACCTCTCAGGAAGACAGAAGTTCTGGGTCTACCACTGAATTACA
  V  S  A  I  H  T  S  Q  E  D  R  S  S  G  S  T  T  E  L  H
                            |901                           |911

       |2741      |2751      |2761      |2771      |2781      |2791
TTGTGTGACAGATGAGAGAAATGCACTTAGAAGAAGCTCTGCTGCCCATACACATTCAAA
  C  V  T  D  E  R  N  A  L  R  R  S  S  A  A  H  T  H  S  N
                            |921                           |931
```

```
     |2801      |2811      |2821      |2831      |2841      |2851
CACTTACAATTTCACTAAGTCGGAAAATTCAAATAGGACATGTTCTATGCCTTATGCCAA
  T  Y  N  F  T  K  S  E  N  S  N  R  T  C  S  M  P  Y  A  K
                              |941                         |951

     |2861      |2871      |2881      |2891      |2901      |2911
ATTAGAATACAAGAGATCTTCAAATGATAGTTTAAATAGTGTCAGTAGTAGTGATGGTTA
  L  E  Y  K  R  S  S  N  D  S  L  N  S  V  S  S  S  D  G  Y
                              |961                         |971

     |2921      |2931      |2941      |2951      |2961      |2971
TGGTAAAAGAGGTCAAATGAAACCCTCGATTGAATCCTATTCTGAAGATGATGAAAGTAA
  G  K  R  G  Q  M  K  P  S  I  E  S  Y  S  E  D  D  E  S  K
                              |981                         |991

     |2981      |2991      |3001      |3011      |3021      |3031
GTTTTGCAGTTATGGTCAATACCCAGCCGACCTAGCCCATAAAATACATAGTGCAAATCA
  F  C  S  Y  G  Q  Y  P  A  D  L  A  H  K  I  H  S  A  N  H
                              |1001                        |1011

     |3041      |3051      |3061      |3071      |3081      |3091
TATGGATGATAATGATGGAGAACTAGATACACCAATAAATTATAGTCTTAAATATTCAGA
  M  D  D  N  D  G  E  L  D  T  P  I  N  Y  S  L  K  Y  S  D
                              |1021                        |1031

     |3101      |3111      |3121      |3131      |3141      |3151
TGAGCAGTTGAACTCTGGAAGGCAAAGTCCTTCACAGAATGAAAGATGGGCAAGACCCAA
  E  Q  L  N  S  G  R  Q  S  P  S  Q  N  E  R  W  A  R  P  K
                              |1041                        |1051

     |3161      |3171      |3181      |3191      |3201      |3211
ACACATAATAGAAGATGAAATAAAACAAAGTGAGCAAAGACAATCAAGGAATCAAAGTAC
  H  I  I  E  D  E  I  K  Q  S  E  Q  R  Q  S  R  N  Q  S  T
                              |1061                        |1071

     |3221      |3231      |3241      |3251      |3261      |3271
AACTTATCCTGTTTATACTGAGAGCACTGATGATAAACACCTCAAGTTCCAACCACATTT
  T  Y  P  V  Y  T  E  S  T  D  D  K  H  L  K  F  Q  P  H  F
                              |1081                        |1091

     |3281      |3291      |3301      |3311      |3321      |3331
TGGACAGCAGGAATGTGTTTCTCCATACAGGTCACGGGGAGCCAATGGTTCAGAAACAAA
  G  Q  Q  E  C  V  S  P  Y  R  S  R  G  A  N  G  S  E  T  N
                              |1101                        |1111
```

```
      |3341       |3351       |3361       |3371       |3381       |3391
TCGAGTGGGTTCTAATCATGGAATTAATCAAAATGTAAGCCAGTCTTTGTGTCAAGAAGA
  R  V  G  S  N  H  G  I  N  Q  N  V  S  Q  S  L  C  Q  E  D
                              |1121                           |1131


      |3401       |3411       |3421       |3431       |3441       |3451
TGACTATGAAGATGATAAGCCTACCAATTATAGTGAACGTTACTCTGAAGAAGAACAGCA
  D  Y  E  D  D  K  P  T  N  Y  S  E  R  Y  S  E  E  E  Q  H
                              |1141                           |1151


      |3461       |3471       |3481       |3491       |3501       |3511
TGAAGAAGAAGAGAGACCAACAAATTATAGCATAAAATATAATGAAGAGAAACGTCATGT
  E  E  E  E  R  P  T  N  Y  S  I  K  Y  N  E  E  K  R  H  V
                              |1161                           |1171


      |3521       |3531       |3541       |3551       |3561       |3571
GGATCAGCCTATTGATTATAGTTTAAAATATGCCACAGATATTCCTTCATCACAGAAACA
  D  Q  P  I  D  Y  S  L  K  Y  A  T  D  I  P  S  S  Q  K  Q
                              |1181                           |1191


      |3581       |3591       |3601       |3611       |3621       |3631
GTCATTTTCATTCTCAAAGAGTTCATCTGGACAAAGCAGTAAAACCGAACATATGTCTTC
  S  F  S  F  S  K  S  S  S  G  Q  S  S  K  T  E  H  M  S  S
                              |1201                           |1211


      |3641       |3651       |3661       |3671       |3681       |3691
AAGCAGTGAGAATACGTCCACACCTTCATCTAATGCCAAGAGGCAGAATCAGCTCCATCC
  S  S  E  N  T  S  T  P  S  S  N  A  K  R  Q  N  Q  L  H  P
                              |1221                           |1231


      |3701       |3711       |3721       |3731       |3741       |3751
AAGTTCTGCACAGAGTAGAAGTGGTCAGCCTCAAAAGGCTGCCACTTGCAAAGTTTCTTC
  S  S  A  Q  S  R  S  G  Q  P  Q  K  A  A  T  C  K  V  S  S
                              |1241                           |1251


      |3761       |3771       |3781       |3791       |3801       |3811
TATTAACCAAGAAACAATACAGACTTATTGTGTAGAAGATACTCCAATATGTTTTTCAAG
  I  N  Q  E  T  I  Q  T  Y  C  V  E  D  T  P  I  C  F  S  R
                              |1261                           |1271


      |3821       |3831       |3841       |3851       |3861       |3871
ATGTAGTTCATTATCATCTTTGTCATCAGCTGAAGATGAAATAGGATGTAATCAGACGAC
  C  S  S  L  S  S  L  S  S  A  E  D  E  I  G  C  N  Q  T  T
                              |1281                           |1291
```

22

```
       |3881       |3891       |3901       |3911       |3921       |3931
ACAGGAAGCAGATTCTGCTAATACCCTGCAAATAGCAGAAATAAAAGAAAAGATTGGAAC
  Q   E   A   D   S   A   N   T   L   Q   I   A   E   I   K   E   K   I   G   T
                                     |1301                           |1311

       |3941       |3951       |3961       |3971       |3981       |3991
TAGGTCAGCTGAAGATCCTGTGAGCGAAGTTCCAGCAGTGTCACAGCACCCTAGAACCAA
  R   S   A   E   D   P   V   S   E   V   P   A   V   S   Q   H   P   R   T   K
                                     |1321                           |1331

       |4001       |4011       |4021       |4031       |4041       |4051
ATCCAGCAGACTGCAGGGTTCTAGTTTATCTTCAGAATCAGCCAGGCACAAAGCTGTTGA
  S   S   R   L   Q   G   S   S   L   S   S   E   S   A   R   H   K   A   V   E
                                     |1341                           |1351

       |4061       |4071       |4081       |4091       |4101       |4111
ATTTTCTTCAGGAGCGAAATCTCCCTCCAAAAGTGGTGCTCAGACACCCAAAAGTCCACC
  F   S   S   G   A   K   S   P   S   K   S   G   A   Q   T   P   K   S   P   P
                                     |1361                           |1371

       |4121       |4131       |4141       |4151       |4161       |4171
TGAACACTATGTTCAGGAGACCCCACTCATGTTTAGCAGATGTACTTCTGTCAGTTCACT
  E   H   Y   V   Q   E   T   P   L   M   F   S   R   C   T   S   V   S   S   L
                                     |1381                           |1391

       |4181       |4191       |4201       |4211       |4221       |4231
TGATAGTTTTGAGAGTCGTTCGATTGCCAGCTCCGTTCAGAGTGAACCATGCAGTGGAAT
  D   S   F   E   S   R   S   I   A   S   S   V   Q   S   E   P   C   S   G   M
                                     |1401                           |1411

       |4241       |4251       |4261       |4271       |4281       |4291
GGTAAGTGGCATTATAAGCCCCAGTGATCTTCCAGATAGCCCTGGACAAACCATGCCACC
  V   S   G   I   I   S   P   S   D   L   P   D   S   P   G   Q   T   M   P   P
                                     |1421                           |1431

       |4301       |4311       |4321       |4331       |4341       |4351
AAGCAGAAGTAAAACACCTCCACCACCTCCTCAAACAGCTCAAACCAAGCGAGAAGTACC
  S   R   S   K   T   P   P   P   P   P   Q   T   A   Q   T   K   R   E   V   P
                                     |1441                           |1451

       |4361       |4371       |4381       |4391       |4401       |4411
TAAAAATAAAGCACCTACTGCTGAAAAGAGAGAGAGTGGACCTAAGCAAGCTGCAGTAAA
  K   N   K   A   P   T   A   E   K   R   E   S   G   P   K   Q   A   A   V   N
                                     |1461                           |1471
```

23

```
     |4421      |4431      |4441      |4451      |4461      |4471
TGCTGCAGTTCAGAGGGTCCAGGTTCTTCCAGATGCTGATACTTTATTACATTTTGCCAC
  A   A   V   Q   R   V   Q   V   L   P   D   A   D   T   L   L   H   F   A   T
                              |1481                          |1491


     |4481      |4491      |4501      |4511      |4521      |4531
GGAAAGTACTCCAGATGGATTTTCTTGTTCATCCAGCCTGAGTGCTCTGAGCCTCGATGA
  E   S   T   P   D   G   F   S   C   S   S   S   L   S   A   L   S   L   D   E
                              |1501                          |1511


     |4541      |4551      |4561      |4571      |4581      |4591
GCCATTTATACAGAAAGATGTGGAATTAAGAATAATGCCTCCAGTTCAGGAAAATGACAA
  P   F   I   Q   K   D   V   E   L   R   I   M   P   P   V   Q   E   N   D   N
                              |1521                          |1531


     |4601      |4611      |4621      |4631      |4641      |4651
TGGGAATGAAACAGAATCAGAGCAGCCTAAAGAATCAAATGAAAACCAAGAGAAAGAGGC
  G   N   E   T   E   S   E   Q   P   K   E   S   N   E   N   Q   E   K   E   A
                              |1541                          |1551


     |4661      |4671      |4681      |4691      |4701      |4711
AGAAAAAACTATTGATTCTGAAAAGGACCTATTAGATGATTCAGATGATGATGATATTGA
  E   K   T   I   D   S   E   K   D   L   L   D   D   S   D   D   D   D   I   E
                              |1561                          |1571


     |4721      |4731      |4741      |4751      |4761      |4771
AATACTAGAAGAATGTATTATTTCTGCCATGCCAACAAAGTCATCACGTAAAGCAAAAAA
  I   L   E   E   C   I   I   S   A   M   P   T   K   S   S   R   K   A   K   K
                              |1581                          |1591


     |4781      |4791      |4801      |4811      |4821      |4831
GCCAGCCCAGACTGCTTCAAAATTACCTCCACCTGTGGCAAGGAAACCAAGTCAGCTGCC
  P   A   Q   T   A   S   K   L   P   P   P   V   A   R   K   P   S   Q   L   P
                              |1601                          |1611


     |4841      |4851      |4861      |4871      |4881      |4891
TGTGTACAAACTTCTACCATCACAAAACAGGTTGCAACCCCAAAAGCATGTTAGTTTTAC
  V   Y   K   L   L   P   S   Q   N   R   L   Q   P   Q   K   H   V   S   F   T
                              |1621                          |1631


     |4901      |4911      |4921      |4931      |4941      |4951
ACCGGGGGATGATATGCCACGGGTGTATTGTGTTGAAGGGACACCTATAAACTTTTCCAC
  P   G   D   D   M   P   R   V   Y   C   V   E   G   T   P   I   N   F   S   T
                              |1641                          |1651
```

```
        |4961      |4971      |4981      |4991      |5001      |5011
AGCTACATCTCTAAGTGATCTAACAATCGAATCCCCTCCAAATGAGTTAGCTGCTGGAGA
  A  T  S  L  S  D  L  T  I  E  S  P  P  N  E  L  A  A  G  E
                              |1661                          |1671


        |5021      |5031      |5041      |5051      |5061      |5071
AGGAGTTAGAGGAGGGGCACAGTCAGGTGAATTTGAAAAACGAGATACCATTCCTACAGA
  G  V  R  G  G  A  Q  S  G  E  F  E  K  R  D  T  I  P  T  E
                              |1681                          |1691


        |5081      |5091      |5101      |5111      |5121      |5131
AGGCAGAAGTACAGATGAGGCTCAAGGAGGAAAAACCTCATCTGTAACCATACCTGAATT
  G  R  S  T  D  E  A  Q  G  G  K  T  S  S  V  T  I  P  E  L
                              |1701                          |1711


        |5141      |5151      |5161      |5171      |5181      |5191
GGATGACAATAAAGCAGAGGAAGGTGATATTCTTGCAGAATGCATTAATTCTGCTATGCC
  D  D  N  K  A  E  E  G  D  I  L  A  E  C  I  N  S  A  M  P
                              |1721                          |1731


        |5201      |5211      |5221      |5231      |5241      |5251
CAAAGGGAAAAGTCACAAGCCTTTCCGTGTGAAAAAGATAATGGACCAGGTCCAGCAAGC
  K  G  K  S  H  K  P  F  R  V  K  K  I  M  D  Q  V  Q  Q  A
                              |1741                          |1751


        |5261      |5271      |5281      |5291      |5301      |5311
ATCTGCGTCTTCTTCTGCACCCAACAAAAATCAGTTAGATGGTAAGAAAAAGAAACCAAC
  S  A  S  S  S  A  P  N  K  N  Q  L  D  G  K  K  K  K  P  T
                              |1761                          |1771


        |5321      |5331      |5341      |5351      |5361      |5371
TTCACCAGTAAAAACCTATACCACAAAATACTGAATATAGGACACGTGTAAGAAAAAATGC
  S  P  V  K  P  I  P  Q  N  T  E  Y  R  T  R  V  R  K  N  A
                              |1781                          |1791


        |5381      |5391      |5401      |5411      |5421      |5431
AGACTCAAAAAATAATTTAAATGCTGAGAGAGTTTTCTCAGACAACAAAGATTCAAAGAA
  D  S  K  N  N  L  N  A  E  R  V  F  S  D  N  K  D  S  K  K
                              |1801                          |1811


        |5441      |5451      |5461      |5471      |5481      |5491
ACAGAATTTGAAAAATAATTCCAAGGTCTTCAATGATAAGCTCCCAAATAATGAAGATAG
  Q  N  L  K  N  N  S  K  V  F  N  D  K  L  P  N  N  E  D  R
                              |1821                          |1831
```

```
    |5501      |5511      |5521      |5531      |5541      |5551
AGTCAGAGGAAGTTTTGCTTTTGATTCACCTCATCATTACACGCCTATTGAAGGAACTCC
   V  R  G  S  F  A  F  D  S  P  H  H  Y  T  P  I  E  G  T  P
                |1841                                    |1851

    |5561      |5571      |5581      |5591      |5601      |5611
TTACTGTTTTTCACGAAATGATTCTTTGAGTTCTCTAGATTTTGATGATGATGATGTTGA
   Y  C  F  S  R  N  D  S  L  S  S  L  D  F  D  D  D  D  V  D
                |1861                                    |1871

    |5621      |5631      |5641      |5651      |5661      |5671
CCTTTCCAGGGAAAAGGCTGAATTAAGAAAGGCAAAAGAAAATAAGGAATCAGAGGCTAA
   L  S  R  E  K  A  E  L  R  K  A  K  E  N  K  E  S  E  A  K
                |1881                                    |1891

    |5681      |5691      |5701      |5711      |5721      |5731
AGTTACCAGCCACACAGAACTAACCTCCAACCAACAATCAGCTAATAAGACACAAGCTAT
   V  T  S  H  T  E  L  T  S  N  Q  Q  S  A  N  K  T  Q  A  I
                |1901                                    |1911

    |5741      |5751      |5761      |5771      |5781      |5791
TGCAAAGCAGCCAATAAATCGAGGTCAGCCTAAACCCATACTTCAGAAACAATCCACTTT
   A  K  Q  P  I  N  R  G  Q  P  K  P  I  L  Q  K  Q  S  T  F
                |1921                                    |1931

    |5801      |5811      |5821      |5831      |5841      |5851
TCCCCAGTCATCCAAAGACATACCAGACAGAGGGGCAGCAACTGATGAAAAGTTACAGAA
   P  Q  S  S  K  D  I  P  D  R  G  A  A  T  D  E  K  L  Q  N
                |1941                                    |1951

    |5861      |5871      |5881      |5891      |5901      |5911
TTTTGCTATTGAAAATACTCCGGTTTGCTTTTCTCATAATTCCTCTCTGAGTTCTCTCAG
   F  A  I  E  N  T  P  V  C  F  S  H  N  S  S  L  S  S  L  S
                |1961                                    |1971

    |5921      |5931      |5941      |5951      |5961      |5971
TGACATTGACCAAGAAAACAACAATAAAGAAAATGAACCTATCAAAGAGACTGAGCCCCC
   D  I  D  Q  E  N  N  N  K  E  N  E  P  I  K  E  T  E  P  P
                |1981                                    |1991

    |5981      |5991      |6001      |6011      |6021      |6031
TGACTCACAGGGAGAACCAAGTAAACCTCAAGCATCAGGCTATGCTCCTAAATCATTTCA
   D  S  Q  G  E  P  S  K  P  Q  A  S  G  Y  A  P  K  S  F  H
                |2001                                    |2011
```

26

```
     |6041      |6051      |6061      |6071      |6081      |6091
TGTTGAAGATACCCCAGTTTGTTTCTCAAGAAACAGTTCTCTCAGTTCTCTTAGTATTGA
 V   E   D   T   P   V   C   F   S   R   N   S   S   L   S   S   L   S   I   D
                                  |2021                          |2031

     |6101      |6111      |6121      |6131      |6141      |6151
CTCTGAAGATGACCTGTTGCAGGAATGTATAAGCTCCGCAATGCCAAAAAAGAAAAAGCC
 S   E   D   D   L   L   Q   E   C   I   S   S   A   M   P   K   K   K   P
                          |2041                          |2051

     |6161      |6171      |6181      |6191      |6201      |6211
TTCAAGACTCAAGGGTGATAATGAAAAACATAGTCCCAGAAATATGGGTGGCATATTAGG
 S   R   L   K   G   D   N   E   K   H   S   P   R   N   M   G   G   I   L   G
                          |2061                          |2071

     |6221      |6231      |6241      |6251      |6261      |6271
TGAAGATCTGACACTTGATTTGAAAGATATACAGAGACCAGATTCAGAACATGGTCTATC
 E   D   L   T   L   D   L   K   D   I   Q   R   P   D   S   E   H   G   L   S
                          |2081                          |2091

     |6281      |6291      |6301      |6311      |6321      |6331
CCCTGATTCAGAAAATTTTGATTGGAAAGCTATTCAGGAAGGTGCAAATTCCATAGTAAG
 P   D   S   E   N   F   D   W   K   A   I   Q   E   G   A   N   S   I   V   S
                          |2101                          |2111

     |6341      |6351      |6361      |6371      |6381      |6391
TAGTTTACATCAAGCTGCTGCTGCTGCATGTTTATCTAGACAAGCTTCGTCTGATTCAGA
 S   L   H   Q   A   A   A   A   A   C   L   S   R   Q   A   S   S   D   S   D
                          |2121                          |2131

     |6401      |6411      |6421      |6431      |6441      |6451
TTCCATCCTTTCCCTGAAATCAGGAATCTCTCTGGGATCACCATTTCATCTTACACCTGA
 S   I   L   S   L   K   S   G   I   S   L   G   S   P   F   H   L   T   P   D
                          |2141                          |2151

     |6461      |6471      |6481      |6491      |6501      |6511
TCAAGAAGAAAAACCCTTTACAAGTAATAAAGGCCCACGAATTCTAAAACCAGGGGAGAA
 Q   E   E   K   P   F   T   S   N   K   G   P   R   I   L   K   P   G   E   K
                          |2161                          |2171

     |6521      |6531      |6541      |6551      |6561      |6571
AAGTACATTGGAAACTAAAAAGATAGAATCTGAAAGTAAAGGAATCAAAGGAGGAAAAAA
 S   T   L   E   T   K   K   I   E   S   E   S   K   G   I   K   G   G   K   K
                          |2181                          |2191
```

27

```
         |6581       |6591       |6601       |6611       |6621       |6631
AGTTTATAAAAGTTTGATTACTGGAAAAGTTCGATCTAATTCAGAAATTTCAGGCCAAAT
  V   Y   K   S   L   I   T   G   K   V   R   S   N   S   E   I   S   G   Q   M
                                   |2201                              |2211

         |6641       |6651       |6661       |6671       |6681       |6691
GAAACAGCCCCTTCAAGCAAACATGCCTTCAATCTCTCGAGGCAGGACAATGATTCATAT
  K   Q   P   L   Q   A   N   M   P   S   I   S   R   G   R   T   M   I   H   I
                                   |2221                              |2231

         |6701       |6711       |6721       |6731       |6741       |6751
TCCAGGAGTTCGAAATAGCTCCTCAAGTACAAGTCCTGTTTCTAAAAAAGGCCCACCCCT
  P   G   V   R   N   S   S   S   S   T   S   P   V   S   K   K   G   P   P   L
                                   |2241                              |2251

         |6761       |6771       |6781       |6791       |6801       |6811
TAAGACTCCAGCCTCCAAAAGCCCTAGTGAAGGTCAAACAGCCACCACTTCTCCTAGAGG
  K   T   P   A   S   K   S   P   S   E   G   Q   T   A   T   T   S   P   R   G
                                   |2261                              |2271

         |6821       |6831       |6841       |6851       |6861       |6871
AGCCAAGCCATCTGTGAAATCAGAATTAAGCCCTGTTGCCAGGCAGACATCCCAAATAGG
  A   K   P   S   V   K   S   E   L   S   P   V   A   R   Q   T   S   Q   I   G
                                   |2281                              |2291

         |6881       |6891       |6901       |6911       |6921       |6931
TGGGTCAAGTAAAGCACCTTCTAGATCAGGATCTAGAGATTCGACCCCTTCAAGACCTGC
  G   S   S   K   A   P   S   R   S   G   S   R   D   S   T   P   S   R   P   A
                                   |2301                              |2311

         |6941       |6951       |6961       |6971       |6981       |6991
CCAGCAACCATTAAGTAGACCTATACAGTCTCCTGGCCGAAACTCAATTTCCCCTGGTAG
  Q   Q   P   L   S   R   P   I   Q   S   P   G   R   N   S   I   S   P   G   R
                                   |2321                              |2331

         |7001       |7011       |7021       |7031       |7041       |7051
AAATGGAATAAGTCCTCCTAACAAATTATCTCAACTTCCAAGGACATCATCCCCTAGTAC
  N   G   I   S   P   P   N   K   L   S   Q   L   P   R   T   S   S   P   S   T
                                   |2341                              |2351

         |7061       |7071       |7081       |7091       |7101       |7111
TGCTTCAACTAAGTCCTCAGGTTCTGGAAAAAATGTCATATACATCTCCAGGTAGACAGAT
  A   S   T   K   S   S   G   S   G   K   M   S   Y   T   S   P   G   R   Q   M
                                   |2361                              |2371
```

28

```
|7121      |7131      |7141      |7151      |7161      |7171
GAGCCAACAGAACCTTACCAAACAAACAGGTTTATCCAAGAATGCCAGTAGTATTCCAAG
 S  Q  Q  N  L  T  K  Q  T  G  L  S  K  N  A  S  S  I  P  R
                        |2381                            |2391

|7181      |7191      |7201      |7211      |7221      |7231
AAGTGAGTCTGCCTCCAAAGGACTAAATCAGATGAATAATGGTAATGGAGCCAATAAAAA
 S  E  S  A  S  K  G  L  N  Q  M  N  N  G  N  G  A  N  K  K
                        |2401                            |2411

|7241      |7251      |7261      |7271      |7281      |7291
GGTAGAACTTTCTAGAATGTCTTCAACTAAATCAAGTGGAAGTGAATCTGATAGATCAGA
 V  E  L  S  R  M  S  S  T  K  S  S  G  S  E  S  D  R  S  E
                        |2421                            |2431

|7301      |7311      |7321      |7331      |7341      |7351
AAGACCTGTATTAGTACGCCAGTCAACTTTCATCAAAGAAGCTCCAAGCCCAACCTTAAG
 R  P  V  L  V  R  Q  S  T  F  I  K  E  A  P  S  P  T  L  R
                        |2441                            |2451

|7361      |7371      |7381      |7391      |7401      |7411
AAGAAAATTGGAGGAATCTGCTTCATTTGAATCTCTTTCTCCATCATCTAGACCAGCTTC
 R  K  L  E  E  S  A  S  F  E  S  L  S  P  S  S  R  P  A  S
                        |2461                            |2471

|7421      |7431      |7441      |7451      |7461      |7471
TCCCACTAGGTCCCAGGCACAAACTCCAGTTTTAAGTCCTTCCCTTCCTGATATGTCTCT
 P  T  R  S  Q  A  Q  T  P  V  L  S  P  S  L  P  D  M  S  L
                        |2481                            |2491

|7481      |7491      |7501      |7511      |7521      |7531
ATCCACACATTCGTCTGTTCAGGCTGGTGGATGGCGAAAACTCCCACCTAATCTCAGTCC
 S  T  H  S  S  V  Q  A  G  G  W  R  K  L  P  P  N  L  S  P
                        |2501                            |2511

|7541      |7551      |7561      |7571      |7581      |7591
CACTATAGAGTATAATGATGGAAGACCAGCAAAGCGCCATGATATTGCACGGTCTCATTC
 T  I  E  Y  N  D  G  R  P  A  K  R  H  D  I  A  R  S  H  S
                        |2521                            |2531

|7601      |7611      |7621      |7631      |7641      |7651
TGAAAGTCCTTCTAGACTTCCAATCAATAGGTCAGGAACCTGGAAACGTGAGCACAGCAA
 E  S  P  S  R  L  P  I  N  R  S  G  T  W  K  R  E  H  S  K
                        |2541                            |2551
```

29

```
|7661      |7671      |7681      |7691      |7701      |7711
ACATTCATCATCCCTTCCTCGAGTAAGCACTTGGAGAAGAACTGGAAGTTCATCTTCAAT
 H  S  S  S  L  P  R  V  S  T  W  R  R  T  G  S  S  S  I
                              |2561                      |2571


|7721      |7731      |7741      |7751      |7761      |7771
TCTTTCTGCTTCATCAGAATCCAGTGAAAAAGCAAAAAGTGAGGATGAAAAACATGTGAA
 L  S  A  S  S  E  S  S  E  K  A  K  S  E  D  E  K  H  V  N
                              |2581                      |2591


|7781      |7791      |7801      |7811      |7821      |7831
CTCTATTTCAGGAACCAAACAAAGTAAAGAAAACCAAGTATCCGCAAAAGGAACATGGAG
 S  I  S  G  T  K  Q  S  K  E  N  Q  V  S  A  K  G  T  W  R
                              |2601                      |2611


|7841      |7851      |7861      |7871      |7881      |7891
AAAAATAAAAGAAAATGAATTTTCTCCCACAAATAGTACTTCTCAGACCGTTTCCTCAGG
 K  I  K  E  N  E  F  S  P  T  N  S  T  S  Q  T  V  S  S  G
                              |2621                      |2631


|7901      |7911      |7921      |7931      |7941      |7951
TGCTACAAATGGTGCTGAATCAAAGACTCTAATTTATCAAATGGCACCTGCTGTTTCTAA
 A  T  N  G  A  E  S  K  T  L  I  Y  Q  M  A  P  A  V  S  K
                              |2641                      |2651


|7961      |7971      |7981      |7991      |8001      |8011
AACAGAGGATGTTTGGGTGAGAATTGAGGACTGTCCCATTAACAATCCTAGATCTGGAAG
 T  E  D  V  W  V  R  I  E  D  C  P  I  N  N  P  R  S  G  R
                              |2661                      |2671


|8021      |8031      |8041      |8051      |8061      |8071
ATCTCCCACAGGTAATACTCCCCCGGTGATTGACAGTGTTTCAGAAAAGGCAAATCCAAA
 S  P  T  G  N  T  P  P  V  I  D  S  V  S  E  K  A  N  P  N
                              |2681                      |2691


|8081      |8091      |8101      |8111      |8121      |8131
CATTAAAGATTCAAAAGATAATCAGGCAAAACAAAATGTGGGTAATGGCAGTGTTCCCAT
 I  K  D  S  K  D  N  Q  A  K  Q  N  V  G  N  G  S  V  P  M
                              |2701                      |2711


|8141      |8151      |8161      |8171      |8181      |8191
GCGTACCGTGGGTTTGGAAAATCGCCTGAACTCCTTTATTCAGGTGGATGCCCCTGACCA
 R  T  V  G  L  E  N  R  L  N  S  F  I  Q  V  D  A  P  D  Q
                              |2721                      |2731
```

30

```
    |8201      |8211      |8221      |8231      |8241      |8251
AAAAGGAACTGAGATAAAACCAGGACAAAATAATCCTGTCCCTGTATCAGAGACTAATGA
  K   G   T   E   I   K   P   G   Q   N   N   P   V   P   V   S   E   T   N   E
                              |2741                              |2751


    |8261      |8271      |8281      |8291      |8301      |8311
AAGTTCTATAGTGGAACGTACCCCATTCAGTTCTAGCAGCTCAAGCAAACACAGTTCACC
  S   S   I   V   E   R   T   P   F   S   S   S   S   S   K   H   S   S   P
                              |2761                              |2771


    |8321      |8331      |8341      |8351      |8361      |8371
TAGTGGGACTGTTGCTGCCAGAGTGACTCCTTTTAATTACAACCCAAGCCCTAGGAAAAG
  S   G   T   V   A   A   R   V   T   P   F   N   Y   N   P   S   P   R   K   S
                              |2781                              |2791


    |8381      |8391      |8401      |8411      |8421      |8431
CAGCGCAGATAGCACTTCAGCTCGGCCATCTCAGATCCCAACTCCAGTGAATAACAACAC
  S   A   D   S   T   S   A   R   P   S   Q   I   P   T   P   V   N   N   T
                              |2801                              |2811


    |8441      |8451      |8461      |8471      |8481      |8491
AAAGAAGCGAGATTCCAAAACTGACAGCACAGAATCCAGTGGAACCCAAAGTCCTAAGCG
  K   K   R   D   S   K   T   D   S   T   E   S   S   G   T   Q   S   P   K   R
                              |2821                              |2831


    |8501      |8511      |8521      |8531      |*11       |*21
CCATTCTGGGTCTTACCTTGTGACATCTGTTTAAAAGAGAGGAAGAATGAAACTAAGAAA
  H   S   G   S   Y   L   V   T   S   V   *
                              |2841


    |*31       |*41       |*51       |*61       |*71       |*81
ATTCTATGTTAATTACAACTGCTATATAGACATTTTGTTTCAAATGAAACTTTAAAAGAC


    |*91       |*101      |*111      |*121      |*131      |*141
TGAAAAATTTTGTAAATAGGTTTGATTCTTGTTAGAGGGTTTTTGTTCTGGAAGCCATAT


    |*151      |*161      |*171      |*181      |*191      |*201
TTGATAGTATACTTTGTCTTCACTGGTCTTATTTTGGGAGGCACTCTTGATGGTTAGGAA


    |*211      |*221      |*231      |*241      |*251      |*261
AAAAATAGTAAAGCCAAGTATGTTTGTACAGTATGTTTTACATGTATTTAAAGTAGCATC


    |*271      |*281      |*291      |*301      |*311      |*321
CCATCCCAACTTCCTTTAATTATTGCTTGTCTTAAAATAATGAACACTACAGATAGAAAA
```

```
    |*331       |*341       |*351       |*361       |*371       |*381
TATGATATATTGCTGTTATCAATCATTTCTAGATTATAAACTGACTAAACTTACATCAGG

    |*391       |*401       |*411       |*421       |*431       |*441
GAAAAATTGGTATTTATGCAAAAAAAAATGTTTTTGTCCTTGTGAGTCCATCTAACATCA

    |*451       |*461       |*471       |*481       |*491       |*501
TAATTAATCATGTGGCTGTGAAATTCACAGTAATATGGTTCCCGATGAACAAGTTTACCC

    |*511       |*521       |*531       |*541       |*551       |*561
AGCCTGCTTTGCTTTACTGCATGAATGAAACTGATGGTTCAATTTCAGAAGTAATGATTA

    |*571       |*581       |*591       |*601       |*611       |*621
ACAGTTATGTGGTCACATGATGTGCATAGAGATAGCTACAGTGTAATAATTTACACTATT

    |*631       |*641       |*651       |*661       |*671       |*681
TTGTGCTCCAAACAAAACAAAAATCTGTGTAACTGTAAAACATTGAATGAAACTATTTTA

    |*691       |*701       |*711       |*721       |*731       |*741
CCTGAACTAGATTTTATCTGAAAGTAGGTAGAATTTTTGCTATGCTGTAATTTGTTGTAT

    |*751       |*761       |*771       |*781       |*791       |*801
ATTCTGGTATTTGAGGTGAGATGGCTGCTCTTTTATTAATGAGACATGAATTGTGTCTCA

    |*811       |*821       |*831       |*841       |*851       |*861
ACAGAAACTAAATGAACATTTCAGAATAAATTATTGCTGTATGTAAACTGTTACTGAAAT

    |*871       |*881       |*891       |*901       |*911       |*921
TGGTATTTGTTTGAAGGGTCTTGTTTCACATTTGTATTAATAATTGTTTAAAATGCCTCT

    |*931       |*941       |*951       |*961       |*971       |*981
TTTAAAAGCTTATATAAATTTTTTTCTTCAGCTTCTATGCATTAAGAGTAAAATTCCTCT

    |*991       |*1001      |*1011      |*1021      |*1031      |*1041
TACTGTAATAAAAACAATTGAAGAAGACTGTTGCCACTTAACCATTCCATGCGTTGGCAC

    |*1051      |*1061      |*1071      |*1081      |*1091      |*1101
TTATCTATTCCTGAAATTTCTTTTATGTGATTAGCTCATCTTGATTTTTAATATTTTTCC

    |*1111      |*1121      |*1131      |*1141      |*1151      |*1161
ACTTAAACTTTTTTTTCTTACTCCACTGGAGCTCAGTAAAAGTAAATTCATGTAATAGCA

    |*1171      |*1181      |*1191      |*1201      |*1211      |*1221
ATGCAAGCAGCCTAGCACAGACTAAGCATTGAGCATAATAGGCCCACATAATTTCCTCTT
```

```
    |*1231      |*1241      |*1251      |*1261      |*1271      |*1281
TCTTAATATTATAGAATTCTGTACTTGAAATTGATTCTTAGACATTGCAGTCTCTTCGAG

    |*1291      |*1301      |*1311      |*1321      |*1331      |*1341
GCTTTACAGTGTAAACTGTCTTGCCCCTTCATCTTCTTGTTGCAACTGGGTCTGACATGA

    |*1351      |*1361      |*1371      |*1381      |*1391      |*1401
ACACTTTTTATCACCCTGTATGTTAGGGCAAGATCTCAGCAGTGAAGTATAATCAGCACT

    |*1411      |*1421      |*1431      |*1441      |*1451      |*1461
TTGCCATGCTCAGAAAATTCAAATCACATGGAACTTTAGAGGTAGATTTAATACGATTAA

    |*1471      |*1481      |*1491      |*1501      |*1511      |*1521
GATATTCAGAAGTATATTTTAGAATCCCTGCCTGTTAAGGAAACTTTATTTGTGGTAGGT

    |*1531      |*1541      |*1551      |*1561      |*1571      |*1581
ACAGTTCTGGGGTACATGTTAAGTGTCCCCTTATACAGTGGAGGGAAGTCTTCCTTCCTG

    |*1591      |*1601      |*1611      |*1621      |*1631      |*1641
AAGGAAAATAAACTGACACTTATTAACTAAGATAATTTACTTAATATATCTTCCCTGATT

    |*1651      |*1661      |*1671      |*1681      |*1691      |*1701
TGTTTTAAAAGATCAGAGGGTGACTGATGATACATGCATACATATTTGTTGAATAAATGA

    |*1711      |*1721      |*1731      |*1741      |*1751      |*1761
AAATTTATTTTTAGTGATAAGATTCATACACTCTGTATTTGGGGAGGGAAAACCTTTTTA

    |*1771      |*1781      |*1791      |*1801      |*1811      |*1821
AGCATGGTGGGGCACTCAGATAGGAGTGAATACACCTACCTGGTGCCTTGAAAATCACAT

    |*1831      |*1841      |*1851      |*1861      |*1871      |*1881
CAAGTAGTTAATTATCTACCCCTTACCTGTGTTTATAACTTCCAGGTAATGAGAATGATT

    |*1891      |*1901      |*1911      |*1921      |*1931      |*1941
TTTTTTAAAGCTAAAATGCCAGTAAATAAAAGTGCTATGACTTGAGCTAAGATATTTGAC

    |*1951      |*1961      |*1971      |*1981      |*1991      |*2001
TCCAATGCCTGTACTGTGTCTACTGCACCACTTTGTAAACACTTCAATTTACTATCTTTG

    |*2011      |*2021      |*2031      |*2041      |*2051      |*2061
AAATGATTGACCTTTAAATTTTTGCCAAATGTTATCTGAAATTGTCTATGAATACCATCT

    |*2071      |*2081      |*2091      |*2101      |*2111 .     .
ACTTCTGTTGTTTTCCCAGGCTTCCATAAACAATGGAGATACATGCAtataggtcatact
```

```
          .         .         .         .         .         .         .         .         .         .         .         .
ggtttcctttcattttttgattttctatttctaattttctgaattactgcatgccagttg

          .         .         .         .         .         .         .         .         .         .         .         .
ttgcaaaccacttcaagtacttctatggaaagagatggatgttagtcaattagataaact

          .         .         .         .         .         .         .         .         .         .         .         .
tgccttttaattcaaataaggaagaaaatataaatgctgaaaatgaacattccacatgcc

          .         .         .         .         .         .         .         .         .         .         .         .
agaaaagtggaattttttgtaggcaacacttgagtggggggagacgggccagtctatacta

          .         .         .         .         .         .         .         .         .         .
cccattgaagtaaagactgctggatgaggccctctgttagagatagt
```

LRG Parser: Version: 1.1, Version Date: 11/02/2015
Reader: Version: 1, Version Date: 11/02/2015
Writer: Version: 1, Version Date: 11/02/2015
Control: Version: 1, Version Date: 11/02/2015