Gene: EGFR - Sequence: NG_007726.3
Date : January 12, 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 1 | Start: 1 | End: 334 | Length: 333


```
      .     .     .     .     .     .     .     .     .     .     .     .

      ggaccgggtccagaggggcagtgctgggaacgcccctctcggaaattaactcctcagggc


      .     .     .     .     .     .     .     .     .     .     .     .

      acccgctcccctcccatgcgccgccccactcccgccggagactaggtcccgcggggggcca


      .     .     .     .     .     .     .     .     .     .     .     .

      ccgctgtccaccgcctccggcggccgctggccttgggtccccgctgctggttctcctccc


      .     .     .     .     .     .     .     .     .     .     .     .

      tcctcctcgcattctcctcctcctctgctcctcccgatccctcctccgccgcctggtccc


      .     .     .     .     .     .     .     .     .     .     .     .

      tcctcctcccgccctgcctccccgcgcctcggcccgcgcgagctagacgtccgggcagcc


           |-239      |-229      |-219      |-209      |-199      |-189
      CCCCGGCGCAGCGCGGCCGCAGCAGCCTCCGCCCCCCGCACGGTGTGAGCGCCCGACGCG


           |-179      |-169      |-159      |-149      |-139      |-129
      GCCGAGGCGGCCGGAGTCCCGAGCTAGCCCCGGCGGCCGCCGCCGCCCAGACCGGACGAC


           |-119      |-109      |-99       |-89       |-79       |-69
      AGGCCACCTCGTCGGCGTCCGCCCGAGTCCCCGCCTCGCCGCCAACGCCACAACCACCGC


           |-59       |-49       |-39       |-29       |-19       |-9
      GCACGGCCCCCTGACTCCGTCCAGTATTGATCGGGAGAGCCGGAGCGAGCTCTTCGGGGA


           |1         |11        |21        |31        |41        |51
      GCAGCGATGCGACCCTCCGGGACGGCCGGGGCAGCGCTCCTGGCGCTGCTGGCTGCGCTC
            M   R   P   S   G   T   A   G   A   A   L   L   A   L   L   A   A   L
            |1                                      |11
```

1

```
      |61         |71         |81        .       .       .       .       .
TGCCCGGCGAGTCGGGCTCTGGAGGAAAAGAAAGgtaagggcgtgtctcgccggctcccg
C  P  A  S  R  A  L  E  E  K  K  V
       |21


          .       .       .       .       .       .       .       .       .       .
cgccgcccccggatcgcgccccggaccccgcagcccgcccaaccgcgcaccggcgcaccg


          .       .       .       .       .       .       .       .       .       .
gctcggcgcccgcgcccccgcccgtcctttcctgtttccttgagatcagctgcgccgccg


          .       .       .       .       .       .       .       .       .       .
accgggaccgcgggaggaacgggacgtttcgttcttcggccgggagagtctggggcgggc


          .       .       .       .       .       .       .       .       .       .
ggaggaggagacgcgtgggacaccgggctgcaggccaggcggggaacggccgccgggacc


          .       .       .       .       .       .       .
tccggcgccccgaaccgctcccaactttcttccc




Exon 2 | Start: 335 | End: 486 | Length: 151




          .       .       .       .       .       .       .       .       .       .
ttcaatgcattatagggacaagctatctcttattatgaattgcaccttatataaacttaa


          .       .       .       .       .       .       .       .       .       .
agatcttttatcacaaatttctttgctgtgtcctttagtgagaatttgtattatcagtca


          .       .       .       .       .       .       .       .       .       .
ctaaagctcactaagttagtaagctttgcgcccagatgacctgggcaggaatgggtgagt


          .       .       .       .       .       .       .       .       .       .
ctctgtgtggagagagtgaagaaactgctacccttaatacctggaccttgagggattgtt


          .       .       .       .       .       .       .       .       .       .
ttattttagttttttctgcatttctcagtatttcatgtgatatctgtcttttttcttccagt

   |91         |101        |111        |121        |131        |141
TTTGCCAAGGCACGAGTAACAAGCTCACGCAGTTGGGCACTTTTGAAGATCATTTTCTCA
  C  Q  G  T  S  N  K  L  T  Q  L  G  T  F  E  D  H  F  L  S
   |31                            |41
```

2

```
        |151      |161      |171      |181      |191      |201
GCCTCCAGAGGATGTTCAATAACTGTGAGGTGGTCCTTGGGAATTTGGAAATTACCTATG
 L  Q  R  M  F  N  N  C  E  V  V  L  G  N  L  E  I  T  Y  V
 |51                                 |61

        |211      |221      |231         .    .    .    .    .
TGCAGAGGAATTATGATCTTTCCTTCTTAAAGgttggtgactttgattttcctacacaaa
 Q  R  N  Y  D  L  S  F  L  K
 |71


   .    .    .    .    .    .    .    .    .    .    .    .
taaaattggagaaaatctaagtggagaaaggcctgggcagaattccacttgaagtgtgtt

   .    .    .    .    .    .    .    .    .    .    .    .
tattttttgctatggcaatgacaagtcttacagagctacaaacgagagttttatgagaaag

   .    .    .    .    .    .    .    .    .    .    .    .
ccattttaccagctaatgtcaagtaataactagaaaaggatatcaaatagaaacaggcta

   .    .    .    .    .    .    .    .    .    .    .    .
atctggagttccatgtcatcatagacactgacgtttatccctgaccattacctcagtcat

   .    .    .    .    .    .    .    .
gatgtgctgccatactcgctcttaaaaacttt



Exon 3 | Start: 487 | End: 670 | Length: 183



   .    .    .    .    .    .    .    .    .    .    .    .
atttccattttcactggagagtgttgaaccccgtgaggcatgagagcacagtgttccaga

   .    .    .    .    .    .    .    .    .    .    .    .
acaatgcttactgctcattatcacaggggtcaaaggctaacgtgcagggattgttgcaga

   .    .    .    .    .    .    .    .    .    .    .    .
tcgtggacatgctgcctcctgtgtccatgactgcaatcgtctacctattttacagttgtt

   .    .    .    .    .    .    .    .    .    .    .    .
gagcactcgtgtgcattagggttcaactgggcgtcctagggctccctggacccatttttag

   .    .    .    .    .    .    .    .    .    .    .    .
accttgagttcttgagttcctcaaaagagaaatcacgcatttatgttttctcttcttaga
```

```
     |241       |251       |261       |271       |281       |291
ACCATCCAGGAGGTGGCTGGTTATGTCCTCATTGCCCTCAACACAGTGGAGCGAATTCCT
 T  I  Q  E  V  A  G  Y  V  L  I  A  L  N  T  V  E  R  I  P
     |81                                        |91

     |301       |311       |321       |331       |341       |351
TTGGAAAACCTGCAGATCATCAGAGGAAATATGTACTACGAAAATTCCTATGCCTTAGCA
 L  E  N  L  Q  I  I  R  G  N  M  Y  Y  E  N  S  Y  A  L  A
     |101                                       |111

     |361       |371       |381       |391       |401       |411
GTCTTATCTAACTATGATGCAAATAAAACCGGACTGAAGGAGCTGCCCATGAGAAATTTA
 V  L  S  N  Y  D  A  N  K  T  G  L  K  E  L  P  M  R  N  L
     |121                                       |131

     |421      .         .         .         .         .         .
CAGGgtgagaggctgggatgccaaggctgggggttcataaatgcagacagcagttccgat
 Q  E
     |141


         .         .         .         .         .         .
ggctcccagcgagcttgtcactcaattccacctcggagaaggctttttatttttacccagt


         .         .         .         .         .         .
acacgtgcactgagtgccggctgtgtgtaagatactgcaggggaagttactgagaagatg


         .         .         .         .         .         .
gcagatactggaatgggaagatttaagcggggtaccagtgtttacatggacatgaaaaaa


         .         .         .         .         .         .
tactgagagatagtaagaaatcgtaaagattctgagtaaaagagagtatgaccaaacaag

         .
ctga



Exon 4 | Start: 671 | End: 805 | Length: 134



     .         .         .         .         .         .         .
catgcatatcatttatgctgtgaccactgactaaaccattctcttccttcctccccatat

     .         .         .         .         .         .         .
ttctaaatttctaatcattgctcaaagcccaattcagagaaaaccctagctcctccatgg
```

4

```
       .         .         .         .         .         .         .         .         .         .
    caccatcattaacaattttatctggccgcccccgggaagttcactgggctaattgcggg


       .         .         .         .         .         .         .         .         .         .
    actcttgttcgcaccatggcatctctttagcagaacataaatgcgaagagcacatgcatc


       .         .         .         .         .         .         .         .         .         .
    cttcatgggaatttaaaggagctggaaagagtgctcaccgcagttccattctcccgcaga

          |431       |441       |451       |461       |471       |481
    AAATCCTGCATGGCGCCGTGCGGTTCAGCAACAACCCTGCCCTGTGCAACGTGGAGAGCA
      I   L   H   G   A   V   R   F   S   N   N   P   A   L   C   N   V   E   S   I
                                          |151                               |161

          |491       |501       |511       |521       |531       |541
    TCCAGTGGCGGGACATAGTCAGCAGTGACTTTCTCAGCAACATGTCGATGGACTTCCAGA
      Q   W   R   D   I   V   S   S   D   F   L   S   N   M   S   M   D   F   Q   N
                                          |171                               |181

          |551                 .         .         .         .         .         .         .
    ACCACCTGGGCAGCTgtaagtgtcgcatacacactatctctgcctccagctcctatggggg
      H   L   G   S   C


              .         .         .         .         .         .         .         .         .         .
    gacagctctacagcactggggcaggggagagaagccatgtttagtaagtcacattaatca


              .         .         .         .         .         .         .         .         .         .
    gaaacaaaaagtagtaagcaaaatatctgaccactagaaaagcatgtatttaccacggac


              .         .         .         .         .         .         .         .         .         .
    atagagatcgttttttttgtggcgggtggcagcccagctggttggcagtgcaggccaccgg


              .         .         .         .         .         .         .         .         .         .
    aggcagatcccctgcagggacagcagagcacttgtgtcctgagaagagctgctgttcatg


              .         .         .
    gggctggcagcacca



    Exon 5 | Start: 806 | End: 874 | Length: 68
```

```
        .         .         .         .         .         .         .
   gcagattgtaaacaaggaacctcaaattcatgaaaaattcttgcttatgtggcccatgtc

        .         .         .         .         .         .         .
   agtaattactctctgcctcagtttccgcagctgacatgtaaataaaagcagttcatggtt

        .         .         .         .         .         .         .
   catcttcttttcttatcggggtctcaagtgattctacaaaccagccagccaaacaatcag

        .         .         .         .         .         .         .
   agaataagttgaaaagattgtcttcatttattgaatgtgcttaactcaggcccgggaaag

        .         .         .         .         .         .         .
   ggcgtcatcagtttctcatcatttcactgagatatgcatctattacttttacatttcagg

    |561      |571      |581      |591      |601      |611
   GCCAAAAGTGTGATCCAAGCTGTCCCAATGGGAGCTGCTGGGGTGCAGGAGAGGAGAACT
     Q   K   C   D   P   S   C   P   N   G   S   C   W   G   A   G   E   E   N   C
             |191                              |201

    |621         .         .         .         .         .         .
   GCCAGAAACgtaagtcagtgaacagcctcagacccatgtgtgaccgcccctctcttcctt
     Q   K   L


        .         .         .         .         .         .         .
   cacttgcttaggtgattggatttgttttccctctgaagactccaaagagttactttatta

        .         .         .         .         .         .         .
   cagggtcagatgtgaaccagtaggtgaaggacagtcttgcaaatctcaccgcatgcagtt

        .         .         .         .         .         .         .
   aatccagggtgggctattttgggagcttcagcctatcacaaataagtgaacatcagcagg

        .         .         .         .         .         .         .
   ggctgggcgcggtggctcacccctataatcccagcactttgggaggcggaggcggtcgga

        .         .
   tcacgaggt


   Exon 6 | Start: 875 | End: 993 | Length: 118
```

```
     .         .         .         .         .         .         .
agcaggtattttttgttctttgtatgtgctttctgcattgcccaagatgcatctaattatt

     .         .         .         .         .         .         .
tagcaggtctcaaagtctagacttgatctcatgagttctcttaagtgattaaaaataaat

     .         .         .         .         .         .         .
caggagaaaaaagaggcaatcagaaaagggcatggtttgacttagtttgaatgtggtttc

     .         .         .         .         .         .         .
gttggaagcaaatgtgtcttcactttttcatgaaaaagtctgcaagtgctctgcgacatc

     .         .         .         .         .         .         .
cctgggaaatgatcctaccctcactcttcagctcacagggaacctttgctcttttttcagt

   |631       |641       |651       |661       |671       |681
TGACCAAAATCATCTGTGCCCAGCAGTGCTCCGGGCGCTGCCGTGGCAAGTCCCCCAGTG
  T  K  I  I  C  A  Q  Q  C  S  G  R  C  R  G  K  S  P  S  D
  |211                               |221

   |691       |701       |711       |721       |731       |741
ACTGCTGCCACAACCAGTGTGCTGCAGGCTGCACAGGCCCCCGGGAGAGCGACTGCCTGg
  C  C  H  N  Q  C  A  A  G  C  T  G  P  R  E  S  D  C  L
  |231                               |241

     .         .         .         .         .         .         .
taagatgcccctccagcagcctccctggagcaggctggggctgcacccgccccacccaca

     .         .         .         .         .         .         .
ccaggacagaagacttcctgtgggggagctgtcaattagcatttgtcataacagacagga

     .         .         .         .         .         .         .
tattgccctctgcctggtgacaaagtatctttagtatcctgcctccaccactcactgaga

     .         .         .         .         .         .         .
ccttgggaaaatgatgggactaccatgcctccatttccttacctgacaatgatgcataac

     .         .         .         .         .         .         .
aaagtctctcccagttgaatgcttaaatgatgagatgcctgtgatgtccgtcattagga
```

Exon 7 | Start: 994 | End: 1135 | Length: 141

```
          .         .         .         .         .         .
accgctataatgtgtgaactccatcatctatacgttagtaaacagacgttttttatcat

          .         .         .         .         .         .
aatccataaattatgataggtgggacagtgcacctaagaaaaaaatggactttttagaga

          .         .         .         .         .         .
agggtctttctgactctgcagagggcgccagctgggttttcccacactagtggaacacta

          .         .         .         .         .         .
ggctgcaaagacagtaacttgggctttctgacgggagtcaacaccgtgctgcgcttcctc

          .         .         .         .         .         .
cgtgtgtggcgctgagtgtacttacctcacttgcccagcgtgtcctctctcctccatagg

    |751       |761       |771       |781       |791       |801
GTCTGCCGCAAATTCCGAGACGAAGCCACGTGCAAGGACACCTGCCCCCCACTCATGCTC
V   C   R   K   F   R   D   E   A   T   C   K   D   T   C   P   P   L   M   L
    |251                                 |261

    |811       |821       |831       |841       |851       |861
TACAACCCCACCACGTACCAGATGGATGTGAACCCCGAGGGCAAATACAGCTTTGGTGCC
Y   N   P   T   T   Y   Q   M   D   V   N   P   E   G   K   Y   S   F   G   A
    |271                                 |281

    |871       |881       .         .         .         .         .
ACCTGCGTGAAGAAGTGTCCCCgtgagtcctcctctgtgggccctctaactggtcaggca
T   C   V   K   K   C   P   R
    |291

          .         .         .         .         .         .
tccttgtcccgctctgtctcctgctgagccctggagtatcccatcttggagagtctttgg

          .         .         .         .         .         .
gtggatgtgtttgccttgcttggaggaggcgaccctgtgcccgtccaggcacacaggcga

          .         .         .         .         .         .
ggggagggggctggcttgctaccgaggagcgggcaggtggtggccatctccacccatgggg

          .         .         .         .         .         .
gctgctcagtgcacagggcagatctgggtggccaggccacctcacaggagaaacacctgc

          .         .         .         .
tgctcagccctcaccactcatc
```

Exon 8 | Start: 1136 | End: 1252 | Length: 116


```
        .         .         .         .         .         .         .         .         .         .         .         .
ggtggaggagagggctgaggtgcctgctgggacgcaaaacagctggcccctcaagggacc

        .         .         .         .         .         .         .         .         .         .         .         .
cagtgtttcctgccatgatgaaacacctgtattgtccacattgcggcctagaatgttatt

        .         .         .         .         .         .         .         .         .         .         .         .
aaactcttgaacgggattccttctctatttgcaacctttcattctttgtccttaaagtaa

        .         .         .         .         .         .         .         .         .         .         .         .
ataaagccaaaggaggatggagcctttccatcacccctcaagaggacctggaccgcctgt

        .         .         .         .         .         .         .         .         .         .         .         .
gtgaggcccgagcacctggtgccaccgtcatcaccttccttttcatgctctcttccccagg

 |891       |901       |911       |921       |931       |941
GTAATTATGTGGTGACAGATCACGGCTCGTGCGTCCGAGCCTGTGGGGCCGACAGCTATG
  N  Y  V  V  T  D  H  G  S  C  V  R  A  C  G  A  D  S  Y  E
         |301                                |311

 |951       |961       |971       |981       |991       |1001
AGATGGAGGAAGACGGCGTCCGCAAGTGTAAGAAGTGCGAAGGGCCCTTGCCGCAAAGgta
  M  E  E  D  G  V  R  K  C  K  K  C  E  G  P  C  R  K  V
         |321                                |331

        .         .         .         .         .         .         .         .         .         .         .         .
ggaagcccgccggtgtgcggacgaggcttgttctcggctgctgaggctgggctctcatgc

        .         .         .         .         .         .         .         .         .         .         .         .
cacctccaaaggaacacatcttcctcttctcattaaaaaacaactatacatatcgtttct

        .         .         .         .         .         .         .         .         .         .         .         .
ttaaaacagaagataaagctgtaaagctaggttaggcaatgggaaggcactgaaggttgt

        .         .         .         .         .         .         .         .         .         .         .         .
gacggggtggggggctctgatgagaacagtcacagagccagccccgctcagcagctgcca

        .         .         .         .         .         .         .         .         .         .         .         .
ggtgcccagccctggggagaatccagggaaggcagagctggaagcagtgcagctcca
```

Exon 9 | Start: 1253 | End: 1379 | Length: 126


```
         .      .      .      .      .      .      .      .      .      .      .      .
cagtgcagctccaagcggcccatgggaaataatgaggagaacgcaaggtcagtgtgaggt

         .      .      .      .      .      .      .      .      .      .      .      .
gacagggatggcatctcctacaccgccgtagccccaaagtgtactataggtcctggtgtc

         .      .      .      .      .      .      .      .      .      .      .      .
ccccttcccgcctgcactctccccagccccttcagtgtttgttgagtgaatgaaggatg

         .      .      .      .      .      .      .      .      .      .      .      .
atgtggcagtggcggttccggtgaccggaattccttcctgcttccctctgcctgtggatc

         .      .      .      .      .      .      .      .      .      .      .      .
cctagctattcttaatccaacaaatgtgaacggaatacacgtctctcttatctctgcagt

      |1011      |1021      |1031      |1041      |1051      |1061
TGTGTAACGGAATAGGTATTGGTGAATTTAAAGACTCACTCTCCATAAATGCTACGAATA
   C   N   G   I   G   I   G   E   F   K   D   S   L   S   I   N   A   T   N   I
               |341                                   |351

      |1071      |1081      |1091      |1101      |1111      |1121
TTAAACACTTCAAAAACTGCACCTCCATCAGTGGCGATCTCCACATCCTGCCGGTGGCAT
   K   H   F   K   N   C   T   S   I   S   G   D   L   H   I   L   P   V   A   F
               |361                                   |371

      |1131 .      .      .      .      .      .      .      .      .      .
TTAGGGGgtgagtcacaggttcagttgcttgtataaagaaaaacaaaatctgccttttta
   R   G
```


```
         .      .      .      .      .      .      .      .      .      .      .      .
actggtagagattggtgatcaataatcaccctgttgtttgtttcagtgactccttcacac

         .      .      .      .      .      .      .      .      .      .      .      .
atactcctcctctggatccacaggaactggatattctgaaaaccgtaaaggaaatcacag

         .      .      .      .      .      .      .      .      .      .      .      .
gtttgagctgaattatcacatgaatataaatgggaaatcagtgttttagagagagaactt

         .      .      .      .      .      .      .      .      .      .      .      .
ttcgacatatttcctgttcccttggaataaaaacatttcttctgaaattttaccgttaat
```

```
     .       .
ggctgat
```

Exon 10 | Start: 1380 | End: 1453 | Length: 73

```
     .       .       .       .       .       .       .       .       .       .       .       .
tctgcctgtggatccctagctattcttaatccaacaaatgtgaacggaatacacgtctct

     .       .       .       .       .       .       .       .       .       .       .       .
cttatctctgcagtgtgtaacggaataggtattggtgaatttaaagactcactctccata

     .       .       .       .       .       .       .       .       .       .       .       .
aatgctacgaatattaaacacttcaaaaactgcacctccatcagtggcgatctccacatc

     .       .       .       .       .       .       .       .       .       .       .       .
ctgccggtggcatttaggggggtgagtcacaggttcagttgcttgtataaagaaaaacaaa

     .       .       .       .       .       .       .       .       .       .       .       .
atctgccttttttaactggtagagattggtgatcaataatcaccctgttgtttgtttcagt

        |1141      |1151      |1161      |1171      |1181      |1191
TGACTCCTTCACACATACTCCTCCTCTGGATCCACAGGAACTGGATATTCTGAAAACCGT
 D   S   F   T   H   T   P   P   L   D   P   Q   E   L   D   I   L   K   T   V
        |381                             |391

        |1201       .       .       .       .       .       .       .       .       .
AAAGGAAATCACAGgtttgagctgaattatcacatgaatatataaatgggaaatcagtgttt
 K   E   I   T   G
        |401

     .       .       .       .       .       .       .       .       .       .       .       .
tagagagagaacttttcgacatatttcctgttcccttggaataaaaacatttcttctgaa

     .       .       .       .       .       .       .       .       .       .       .       .
attttaccgttaatggctgatgttttgatattttttcaaaagtgcagtttctcctgcaggc

     .       .       .       .       .       .       .       .       .       .       .       .
aaaaggggacacgttaagtccaggcttgggtcattcactgcggtgtaaacacgctttctc

     .       .       .       .       .       .       .       .       .       .       .       .
cctcccgcccggccccagccagctgccttggtggcccataacccctgagggtagagggag
```

```
          .         .         .
gggacaggggtagg
```

Exon 11 | Start: 1454 | End: 1544 | Length: 90

```
       .         .         .         .         .         .
agcctcttcggggtaatcagatacgcggcgcagcaggggtctcagggccacagccagggg

       .         .         .         .         .         .
ggcggcgggagacatgcggaatcgcagcggaaggcgggaggcagctgtgaactgtggctc

       .         .         .         .         .         .
ggcctgcgtccgccctgcgcatgtacactcagagaagatgataatgaaaaagaaagcaaa

       .         .         .         .         .         .
tccaattttcccacttactgttcatataatacagagtccctgagagtctagagtaatgtc

       .         .         .         .         .         .
tcatacaaaaaagaaactcctacgtggtgtgtgtctgaagtctttcatctgccttacagg

    |1211      |1221      |1231      |1241      |1251      |1261
GGTTTTTGCTGATTCAGGCTTGGCCTGAAAACAGGACGGACCTCCATGCCTTTGAGAACC
  F   L   L   I   Q   A   W   P   E   N   R   T   D   L   H   A   F   E   N   L
                              |411                                   |421

    |1271      |1281      |1291       .         .         .
TAGAAATCATACGCGGCAGGACCAAGCAACAgtaagttgaccacagccaaagcctggtag
  E   I   I   R   G   R   T   K   Q   H
                              |431

       .         .         .         .         .         .
attacatttgcctttttagttggaaattaggcttaacaggagagttgctaagatagggca

       .         .         .         .         .         .
cagagctcctgcatctctcgccggcattcccaaatgctatctcacatgagcaggcacagg

       .         .         .         .         .         .
gagcaagactgcacgaccactggcacaggctgtccgctaaaccacagacttctcagcgct

       .         .         .         .         .         .
cgccagtgcttctgcttctgtgtccactccagatcccacattgcacttagttgtcaaatc
```

12

```
        .       .       .       .       .       .       .
ttttcagtccatttctaacctatattagctc


Exon 12 | Start: 1545 | End: 1744 | Length: 199


        .       .       .       .       .       .       .       .       .       .       .       .
tcaatttccaggcaaaatgaaaatggagaaaatataatgacattaaggcattttattcat

        .       .       .       .       .       .       .       .       .       .       .       .
cctccccatctgccactgggttaaagatactaaataaacaaggaactatcttttgcctgg

        .       .       .       .       .       .       .       .       .       .       .       .
aggaactttaaaaacacctgcagttttcaaaaggtgcagtgtgtgcctcccacagcatga

        .       .       .       .       .       .       .       .       .       .       .       .
cctaccatcattggaaagcagtttgtagtcaatcaaaggtggtctggagaaacaaagttt

        .       .       .       .       .       .       .       .       .       .       .       .
tcagggatacattgttttttataattttttcaccacatgattttttcttctctccaatgtagt

   |1301     |1311     |1321     |1331     |1341     |1351
TGGTCAGTTTTCTCTTGCAGTCGTCAGCCTGAACATAACATCCTTGGGATTACGCTCCCT
 G   Q   F   S   L   A   V   V   S   L   N   I   T   S   L   G   L   R   S   L
                   |441                                         |451

   |1361     |1371     |1381     |1391     |1401     |1411
CAAGGAGATAAGTGATGGAGATGTGATAATTTCAGGAAACAAAAATTTGTGCTATGCAAA
 K   E   I   S   D   G   D   V   I   I   S   G   N   K   N   L   C   Y   A   N
                   |461                                         |471

   |1421     |1431     |1441     |1451     |1461     |1471
TACAATAAACTGGAAAAAAACTGTTTGGGACCTCCGGTCAGAAAACCAAAATTATAAGCAA
 T   I   N   W   K   K   L   F   G   T   S   G   Q   K   T   K   I   I   S   N
                   |481                                         |491

   |1481     |1491     .       .       .       .       .       .       .       .
CAGAGGTGAAAACAGCTGCAgtaagtcaccgctttctgtttagtttatggagttggttct
 R   G   E   N   S   C   K


        .       .       .       .       .       .       .       .       .       .       .       .
```

```
aatgggtcctttatttgtatttagaatattgaagggctattcccatttaaattactttt

    .    .    .    .    .    .    .    .    .    .    .    .
tcagttccttaagaagcaaattaaaatcttaagattcctaactgtgaaattaccatgtga

    .    .    .    .    .    .    .    .    .    .    .    .
attccattaaaactttttccagatcattaccattcaatgggatgaatttaccctgaggtt

    .    .    .    .    .    .    .    .    .    .    .    .
taggctaccaattatttgtaatgtaagtaactaaatttagtattagttatattaccttt

    .    .    .    .
agttgtaggtcactctctgc
```

Exon 13 | Start: 1745 | End: 1877 | Length: 132

```
    .    .    .    .    .    .    .    .    .    .    .    .
ggactcacggcaccccctctcgggtgccagggtgcctggctcccaccaggaggaagacct

    .    .    .    .    .    .    .    .    .    .    .    .
gtcctccactgtcaggcacatttcagtcttcccagcagccagcacaactactttgtcctt

    .    .    .    .    .    .    .    .    .    .    .    .
ccagtcacggtcggcctctgggaagcccagtctgtgtcctcctccttcaggggtagccag

    .    .    .    .    .    .    .    .    .    .    .    .
catgtctgtgtcacccaaggtcatggagcacagggcccctcccgggaaggtgccgtctcc

    .    .    .    .    .    .    .    .    .    .    .    .
tccggcccctcgggtccctgctctgtcactgactgctgtgacccactctgtctccgcaga

   |1501      |1511      |1521      |1531      |1541      |1551
AGGCCACAGGCCAGGTCTGCCATGCCTTGTGCTCCCCCGAGGGCTGCTGGGGCCCGGAGC
   A    T    G    Q    V    C    H    A    L    C    S    P    E    G    C    W    G    P    E    P
   |501                                  |511

   |1561      |1571      |1581      |1591      |1601      |1611
CCAGGGACTGCGTCTCTTGCCGGAATGTCAGCCGAGGCAGGGAATGCGTGGACAAGTGCA
   R    D    C    V    S    C    R    N    V    S    R    G    R    E    C    V    D    K    C    N
   |521                                  |531

   |1621      |1631.    .    .    .    .    .    .    .    .
```

14

```
ACCTTCTGGAGGGgtaggaggttatttctttaatccccttgcgttgatcaaaaataaggc
  L   L   E   G
   |541


      .      .      .      .      .      .      .      .      .      .      .

tccaggttgttgttatagctttacaggcattctgtttgattttctcttccttttattctt

      .      .      .      .      .      .      .      .      .      .      .

tgcccttggcttttggaggttttgggttttctgtggggagacgggaagttgtttgattgc

      .      .      .      .      .      .      .      .      .      .      .

gttattttttggcaaatttaagcacaataggaaataagcaagtattattgcctaatataat

      .      .      .      .      .      .      .      .      .      .      .

ccaataatttatagaatctcttttcctggaagtatcttaaattttttctaagctacaaaaa

      .      .      .

gttcctaagacaa



Exon 14 | Start: 1878 | End: 1968 | Length: 90



      .      .      .      .      .      .      .      .      .      .      .

acacctcctcaggactatcttttcttttatcatttggcttgcttacccaatatgcaaaaa

      .      .      .      .      .      .      .      .      .      .      .

ctatgctgtagaaaaagcagaaaagatatcttgattatgaatgaagctcctgtgtttact

      .      .      .      .      .      .      .      .      .      .      .

cagagagaagatgacccaggattcagttaacaaaatcagctgattatattactatatagt

      .      .      .      .      .      .      .      .      .      .      .

cctggagtcccaactccttgaccattacctcaagttatttggaattttgaagaggtgatt

      .      .      .      .      .      .      .      .      .      .      .

tgtgttcctgcaataatgtctcagggggtgggctgacgggtttcctcttcctcctctcagt

            |1641      |1651      |1661      |1671      |1681      |1691
TGAGCCAAGGGAGTTTGTGGAGAACTCTGAGTGCATACAGTGCCACCCAGAGTGCCTGCC
  E   P   R   E   F   V   E   N   S   E   C   I   Q   C   H   P   E   C   L   P
                        |551                                 |561

            |1701      |1711      |1721 .      .      .      .      .
```

```
TCAGGCCATGAACATCACCTGCACAGGACGGgtaagagccccttgctgctatccacgtcc
 Q   A   M   N   I   T   C   T   G   R
                    |571


.       .       .       .       .       .       .       .

atttcatgggaagggccttcacagaagccgaacagtgatgatggcccagggcatcctgtg

.       .       .       .       .       .       .       .

tgggcaggacggccatcagagccacttcccagaggagacggcaggcgctgacagcgctgt

.       .       .       .       .       .       .       .

ccgggcagggtgtcggtgacattagcacacacattagcctgcgatgaacattcactcttt

.       .       .       .       .       .       .       .

ctgctgacacccccaaccttatctaagcttatcaaatcctcacatttaacggaggctgtt

.       .       .       .       .       .

ttcacctggtttcccccatccctgacctagt



Exon 15 | Start: 1969 | End: 2126 | Length: 157



.       .       .       .       .       .       .       .

ttttgccaaggaaagatgcccacaatggttaagcagaatgcaataatgtagagaatatca

.       .       .       .       .       .       .       .

tttctttcatgctggtgtatatcatatgcattcaaaaacagggagaacttctaagcaact

.       .       .       .       .       .       .       .

aacagtgaccatatcaagcaggtgcaatcacagaataactggttttctcctttaagaatt

.       .       .       .       .       .       .       .

tttctatcatttggctttcccccactcacacacactaaatattttaagtaaaaagttactt

.       .       .       .       .       .       .       .

ccatttتgaaagagaaaagaaagagacatgcatgaacatttttctccaccttggtgcagg

        |1731      |1741      |1751      |1761      |1771      |1781
GGACCAGACAACTGTATCCAGTGTGCCCACTACATTGACGGCCCCCACTGCGTCAAGACC
 G   P   D   N   C   I   Q   C   A   H   Y   I   D   G   P   H   C   V   K   T
                    |581                                   |591

        |1791      |1801      |1811      |1821      |1831      |1841
```

16

```
TGCCCGGCAGGAGTCATGGGAGAAAACAACACCCTGGTCTGGAAGTACGCAGACGCCGGC
C  P  A  G  V  M  G  E  N  N  T  L  V  W  K  Y  A  D  A  G
              |601                           |611


         |1851       |1861       |1871        .    .    .    .
CATGTGTGCCACCTGTGCCATCCAAACTGCACCTACGGgtgagtggaaagtgaaggagaa
H  V  C  H  L  C  H  P  N  C  T  Y  G
                            |621


     .    .    .    .    .    .    .    .    .    .    .    .
cagaacatttcctctcttgcaaattcagagatcaaaaatgtctcccaagttttccggcaa

     .    .    .    .    .    .    .    .    .    .    .    .
caaattgccgaggtttgtatttgagtcagttacttaaggtgttttggtccccacagccat

     .    .    .    .    .    .    .    .    .    .    .    .
gccagtagcaacttgcttgtgagcaggcctcagtgcagtgggaatgactctgccatgcac

     .    .    .    .    .    .    .    .    .    .    .    .
cgtgtccccggccgggcctgtgttgtgcaatgctgcacatcacaacaggagggtaggggg

     .    .    .    .    .    .    .    .    .
acaaaagagcacaggtcctggcagctgccacagtctcc



Exon 16 | Start: 2127 | End: 2165 | Length: 38



     .    .    .    .    .    .    .    .    .    .    .    .
attatctgtgtcaaaagccagatgtgaaaacatctcaataacaaactggctgctttgttc

     .    .    .    .    .    .    .    .    .    .    .    .
aatgctagaacaacgcctgtcacagagtagaaactcaaaaatatttgctgagtgaatgaa

     .    .    .    .    .    .    .    .    .    .    .    .
caaatgaataaatgcataataaataattaaccaccaatccaacatccagacacatagtga

     .    .    .    .    .    .    .    .    .    .    .    .
ttttaattatttaagagtagtttagcatatattgctttatgatttaattaaaaatctcca

     .    .    .    .    .    .    .    .    .    .    .    .
aaatatatgccaaagaagtagaatgagaaaaatgtatatttctctttcacttcctacaga

|1881       |1891       |1901       |1911        .    .    .    .
```

17

```
ATGCACTGGGCCAGGTCTTGAAGGCTGTCCAACGAATGGgtaagtgttcacagctctgtg
 C  T  G  P  G  L  E  G  C  P  T  N  G
           |631


     .    .    .    .    .    .    .    .    .    .    .    .
tcacatggacctcgtcaagaatgaccacactgctgtgggtgaagatgctttcctgcattt

     .    .    .    .    .    .    .    .    .    .    .    .
ctgactgtcctctgtcctgatcaagtttctatggctctgggccagcctaccctcagccag

     .    .    .    .    .    .    .    .    .    .    .    .
ggtttctgcagagactgcccagctggttccacgtggctccacgtgccaactttgtcctca

     .    .    .    .    .    .    .    .    .    .    .    .
gtggagggaaagttggacacacagtgctggggctgctccctgctccgccgttgctcgatg

     .    .    .    .    .    .    .    .
catggcctgcctctgaattccttggttccactggttttg



Exon 17 | Start: 2166 | End: 2307 | Length: 141



     .    .    .    .    .    .    .    .    .    .    .    .
catattttgttaatcaacaaattgaaaaatactcattatatggagaggtccagataaagc

     .    .    .    .    .    .    .    .    .    .    .    .
ctcaattttaaaaaatgaggaaaagtgtgcctggtaggggactggggagagcttgagaaa

     .    .    .    .    .    .    .    .    .    .    .    .
gttggaaacgttgccttagaagcctgttttttctccttttagaagctacatagtgtctca

     .    .    .    .    .    .    .    .    .    .    .    .
ctttccaagatcattctacaagatgtcagtgcactgaaacatgcaggggcgtgttgagtg

     .    .    .    .    .    .    .    .    .    .    .    .
ccaaggccatggaatctgtcagcaacctcacccttccttgttcctccacctcattccagg

 |1921      |1931      |1941      |1951      |1961      |1971
GCCTAAGATCCCGTCCATCGCCACTGGGATGGTGGGGGCCCTCCTCTTGCTGCTGGTGGT
 P  K  I  P  S  I  A  T  G  M  V  G  A  L  L  L  L  V  V
 |641                           |651

 |1981      |1991      |2001      |2011      |2021      |2031
```

18

```
GGCCCTGGGGGATCGGCCTCTTCATGCGAAGGCGCCACATCGTTCGGAAGCGCACGCTGCG
 A  L  G  I  G  L  F  M  R  R  R  H  I  V  R  K  R  T  L  R
 |661                              |671

 |2041      |2051      |2061.    .    .    .    .    .
GAGGCTGCTGCAGGAGAGGGAGgtgagtgccagtcctgggtgggctcaggagccctcgca
 R  L  L  Q  E  R  E
 |681


    .    .    .    .    .    .    .    .    .    .    .    .
ccccgacaggaacaagggccagccccgagaacgggccattagcagttgtgtatgttagat

    .    .    .    .    .    .    .    .    .    .    .    .
acataattgtattatgatgcagaaagaatctctgaatgtgcagttatacccagttggtga

    .    .    .    .    .    .    .    .    .    .    .    .
catgttggtacatccatccgaggaaatggcaatgtttctaggctgcacccttcaatgtcc

    .    .    .    .    .    .    .    .    .    .    .    .
acaaagctgtgtggcatctgcttaggacccggtgcctgtgtgtgcataggagggaggcca

    .    .    .    .    .    .
ggaagcctggctgttgatccca



Exon 18 | Start: 2308 | End: 2430 | Length: 122



    .    .    .    .    .    .    .    .    .    .    .    .
cctaccggagttttcaatccagttaataggcgtggaaacagacatagaaattgtgtttgt

    .    .    .    .    .    .    .    .    .    .    .    .
tgaaaggtagctgttcagttaaagaacacctgtatcagagcctgtgtttctaccaacttc

    .    .    .    .    .    .    .    .    .    .    .    .
tgtcaagctctgtagagaaggcgtacatttgtccttccaaatgagctggcaagtgccgtg

    .    .    .    .    .    .    .    .    .    .    .    .
tcctggcacccaagcccatgccgtggctgctggtccccctgctgggccatgtctggcact

    .    .    .    .    .    .    .    .    .    .    .    .
gctttccagcatggtgagggctgaggtgacccttgtctctgtgttcttgtccccccccagc

            |2071      |2081      |2091      |2101      |2111      |2121
```

```
CTTGTGGAGCCTCTTACACCCAGTGGAGAAGCTCCCAACCAAGCTCTCTTGAGGATCTTG
 L  V  E  P  L  T  P  S  G  E  A  P  N  Q  A  L  L  R  I  L
          |691                            |701

          |2131      |2141      |2151      |2161      |2171      |2181
AAGGAAACTGAATTCAAAAAGATCAAAGTGCTGGGCTCCGGTGCGTTCGGCACGGTGTAT
 K  E  T  E  F  K  K  I  K  V  L  G  S  G  A  F  G  T  V  Y
          |711                            |721


          .         .         .         .         .         .         .
AAGgtaaggtccctggcacaggcctctgggctgggccgcagggcctctcatggtctggtg
K


          .         .         .         .         .         .         .
gggagcccagagtccttgcaagctgtatatttccatcatctactttactctttgtttcac


          .         .         .         .         .         .         .
tgagtgtttgggaaactccagtgttttttcccaagttattgagaggaaatcttttataacc


          .         .         .         .         .         .         .
acagtaatcagtggtcctgtgagaccaattcacagaccaaaggcatttttatgaaagggg


          .         .         .         .         .         .         .
ccattgaccttgccatggggtgcagcacagggcgggaggagggccgcctctcaccgcacg

          .
gca



Exon 19 | Start: 2431 | End: 2529 | Length: 98



          .         .         .         .         .         .         .
taggcctagacgcagcatcattaaattctggatgaaatgatccacacggactttataaca

          .         .         .         .         .         .         .
ggctttacaagcttgagattcttttatctaaataatcagtgtgattcgtggagcccaaca

          .         .         .         .         .         .         .
gctgcagggctgcggggggcgtcacagcccccagcaatatcagccttaggtgcggctccac

          .         .         .         .         .         .         .
agccccagtgtccctcaccttcggggtgcatcgctggtaacatccacccagatcactggg
```

20

```
            .         .         .         .         .         .         .         .         .         .         .         .
         cagcatgtggcaccatctcacaattgccagttaacgtcttccttctctctctgtcatagg

                |2191      |2201      |2211      |2221      |2231      |2241
         GGACTCTGGATCCCAGAAGGTGAGAAAGTTAAAATTCCCGTCGCTATCAAGGAATTAAGA
         G  L  W  I  P  E  G  E  K  V  K  I  P  V  A  I  K  E  L  R
                |731                           |741

                |2251      |2261      |2271      |2281      .         .         .         .
         GAAGCAACATCTCCGAAAGCCAACAAGGAAATCCTCGATgtgagtttctgctttgctgtg
         E  A  T  S  P  K  A  N  K  E  I  L  D
                |751                           |761


            .         .         .         .         .         .         .         .         .         .         .         .
         tgggggtccatggctctgaacctcaggcccaccttttctcatgtctggcagctgctctgc

            .         .         .         .         .         .         .         .         .         .         .         .
         tctagaccctgctcatctccacatcctaaatgttcactttctatgtctttccctttctag

            .         .         .         .         .         .         .         .         .         .         .         .
         ctctagtgggtataactccctcccccttagagacagcactggcctctcccatgctggtatc

            .         .         .         .         .         .         .         .         .         .         .         .
         caccccaaaaggctggaaacaggcaattactggcatctacccagcactagtttcttgaca

            .         .         .         .         .         .         .         .
         cgcatgatgagtgagtgctcttggtgagcctggagcatg



         Exon 20 | Start: 2530 | End: 2715 | Length: 185



            .         .         .         .         .         .         .         .         .         .         .         .
         ggtgactccgactcctcctttatccaatgtgctcctcatggccactgttgcctgggcctc

            .         .         .         .         .         .         .         .         .         .         .         .
         tctgtcatggggaatccccagatgcacccaggaggggccctctcccactgcatctgtcac

            .         .         .         .         .         .         .         .         .         .         .         .
         ttcacagccctgcgtaaacgtccctgtgctaggtcttttgcaggcacagcttttcctcca

            .         .         .         .         .         .         .         .         .         .         .         .
         tgagtacgtattttgaaactcaagatcgcattcatgcgtcttcacctggaaggggtccat
```

```
          .         .         .         .         .         .         .         .         .         .         .         .
      gtgcccctccttctggccaccatgcgaagccacactgacgtgcctctccctccctccagg

              |2291       |2301       |2311       |2321       |2331       |2341
      GAAGCCTACGTGATGGCCAGCGTGGACAACCCCCACGTGTGCCGCCTGCTGGGCATCTGC
      E   A   Y   V   M   A   S   V   D   N   P   H   V   C   R   L   L   G   I   C
                                      |771                                 |781

              |2351       |2361       |2371       |2381       |2391       |2401
      CTCACCTCCACCGTGCAGCTCATCACGCAGCTCATGCCCTTCGGCTGCCTCCTGGACTAT
      L   T   S   T   V   Q   L   I   T   Q   L   M   P   F   G   C   L   L   D   Y
                                      |791                                 |801

              |2411       |2421       |2431       |2441       |2451       |2461
      GTCCGGGAACACAAAGACAATATTGGCTCCCAGTACCTGCTCAACTGGTGTGTGCAGATC
      V   R   E   H   K   D   N   I   G   S   Q   Y   L   L   N   W   C   V   Q   I
                                      |811                                 |821


          .         .         .         .         .         .         .         .         .         .
      GCAAAGgtaatcagggaagggagatacggggaggggagataaggagccaggatcctcaca
      A   K


          .         .         .         .         .         .         .         .         .         .
      tgcggtctgcgctcctgggatagcaagagtttgccatggggatatgtgtgtgcgtgcatg

          .         .         .         .         .         .         .         .         .         .
      cagcacacacacattcctttattttggattcaatcaagttgatcttcttgtgcacaaatc

          .         .         .         .         .         .         .         .         .         .
      agtgcctgtcccatctgcatgtggaaactctcatcaatcagctacctttgaagaattttc

          .         .         .         .         .         .         .         .         .         .
      tctttattgagtgctcagtgtggtctgatgtctctgttcttatttctctggaattctttg

          .         .
      tgaata



      Exon 21 | Start: 2716 | End: 2871 | Length: 155



          .         .         .         .         .         .         .         .         .         .         .
```

22

```
agttcaagcccaggtctcaactgggcagcagagctcctgctcttctttgtcctcatatac

   .        .        .        .        .        .        .
gagcacctctggacttaaaacttgaggaactggatggagaaaagttaatggtcagcagcg

   .        .        .        .        .        .        .
ggttacatcttctttcatgcgcctttccattctttggatcagtagtcactaacgttcgcc

   .        .        .        .        .        .        .
agccataagtcctcgacgtggagaggctcagagcctggcatgaacatgaccctgaattcg

   .        .        .        .        .        .        .
gatgcagagcttcttcccatgatgatctgtccctcacagcagggtcttctctgtttcagg

  |2471     |2481     |2491     |2501     |2511     |2521
GGCATGAACTACTTGGAGGACCGTCGCTTGGTGCACCGCGACCTGGCAGCCAGGAACGTA
 G  M  N  Y  L  E  D  R  R  L  V  H  R  D  L  A  A  R  N  V
                  |831                              |841

  |2531     |2541     |2551     |2561     |2571     |2581
CTGGTGAAAACACCGCAGCATGTCAAGATCACAGATTTTGGGCTGGCCAAACTGCTGGGT
 L  V  K  T  P  Q  H  V  K  I  T  D  F  G  L  A  K  L  L  G
                  |851                              |861

  |2591     |2601     |2611     |2621     .        .        .
GCGGAAGAGAAAGAATACCATGCAGAAGGAGGCAAAgtaaggaggtggctttaggtcagc
 A  E  E  K  E  Y  H  A  E  G  G  K
                  |871

   .        .        .        .        .        .        .
cagcattttcctgacaccagggaccaggctgccttcccactagctgtattgtttaacaca

   .        .        .        .        .        .        .
tgcaggggaggatgctctccagacattctgggtgagctcgcagcagctgctgctggcagc

   .        .        .        .        .        .        .
tgggtccagccagggtctcctggtagtgtgagccagagctgctttgggaacagtacttgc

   .        .        .        .        .        .        .
tgggacagtgaatgaggatgttatccccaggtgatcattagcaaatgttaggtttcagtc

   .        .        .        .        .        .
tctccctgcaggatatataagtccccttcaatagcg
```

Exon 22 | Start: 2872 | End: 2947 | Length: 75


```
         .         .         .         .         .         .         .         .         .         .         .         .
gggccctgaaaacacacgcagacctggatgagtgaggccactgggcacaaccagggctcc

         .         .         .         .         .         .         .         .         .         .         .         .
cagctcaccagagcagcctgggacacagagggtgctcagaaacctaccagagcagccctg

         .         .         .         .         .         .         .         .         .         .         .         .
aactccgtcagactgaaatcccctgttgccgggaggaggcgccgggcctgggggacgggt

         .         .         .         .         .         .         .         .         .         .         .         .
cctggggtgatctggctcgtctgtgtgtgtcactcgtaattaggtccagagtgagttaac

         .         .         .         .         .         .         .         .         .         .         .         .
tttttccaacagagggaaactaatagttgtctcactgcctcatctctcaccatcccaagg

        |2631      |2641      |2651      |2661      |2671      |2681
GTGCCTATCAAGTGGATGGCATTGGAATCAATTTTACACAGAATCTATACCCACCAGAGT
V   P   I   K   W   M   A   L   E   S   I   L   H   R   I   Y   T   H   Q   S
              |881                                      |891

        |2691      |2701.        .         .         .         .         .         .
GATGTCTGGAGCTACGgtgagtcataatcctgatgctaatgagtttgtactgaggccaag
D   V   W   S   Y   G
              |901


         .         .         .         .         .         .         .         .         .         .         .         .
ctggctttattgttagttaatttacattatatcctctgacatgcaagtattttctttcg

         .         .         .         .         .         .         .         .         .         .         .         .
agataatgactaatgataatgtaatcattgctgtctatctattgtactgagaaaacacgg

         .         .         .         .         .         .         .         .         .         .         .         .
cagaggaaatcgagtccagctgccgtccaaaagtcactggagattgcaatgagctcgtct

         .         .         .         .         .         .         .         .         .         .         .         .
ggcagggtggggggtatgggagggaaagagcttaggaaacggctctccctgcaaagtcca

         .         .         .         .
accaaactttaacgtt
```

24

Exon 23 | Start: 2948 | End: 3094 | Length: 146

```
     .     .     .     .     .     .     .     .     .     .     .     .
ttaattaccaaagtttaccacttatcagtcacttactacttgctgggcattgcactaagc

     .     .     .     .     .     .     .     .     .     .     .     .
atttcagttgtattatcttgttgggtccttacagcaatcctgtgaaacagatactgctat

     .     .     .     .     .     .     .     .     .     .     .     .
taccccactttatagagaggtagactgaggcttccagcattgaagcaaattgcccaagac

     .     .     .     .     .     .     .     .     .     .     .     .
tacagaaatgtaggtttctaaacatcaagaaacagtaaccagtaatgatgactaaagcaa

     .     .     .     .     .     .     .     .     .     .     .     .
gggattgtgattgttcattcatgatcccactgccttcttttcttgcttcatcctctcagg

          |2711       |2721       |2731       |2741       |2751       |2761
GGGTGACCGTTTGGGAGTTGATGACCTTTGGATCCAAGCCATATGACGGAATCCCTGCCA
  V   T   V   W   E   L   M   T   F   G   S   K   P   Y   D   G   I   P   A   S
                                        |911                                 |921

          |2771       |2781       |2791       |2801       |2811       |2821
GCGAGATCTCCTCCATCCTGGAGAAAGGAGAACGCCTCCCTCAGCCACCCATATGTACCA
  E   I   S   S   I   L   E   K   G   E   R   L   P   Q   P   P   I   C   T   I
                                        |931                                 |941

          |2831       |2841       .     .     .     .     .     .
TCGATGTCTACATGATCATGGTCAAGTgtgagtgactggtgggtctgtccacactgccta
  D   V   Y   M   I   M   V   K   C

     .     .     .     .     .     .     .     .     .     .     .     .
gctgagccttggtggctgctcttagccaaacagctgaggcctttgcatccctggagaaat

     .     .     .     .     .     .     .     .     .     .     .     .
gtcatcacattacttaaggcaggcacacaaatccagaaacatctgtaaataccccttcaa

     .     .     .     .     .     .     .     .     .     .     .     .
gcattcttttaaagacacttcttgactcattggggcagtatgacctgacatttgcccatgt

     .     .     .     .     .     .     .     .     .     .     .     .
ttgcaagcaaataaataaaactaaagtcttccgcaagccattacaccaaaatattctatt
```

```
    .       .       .       .       .       .
cgctgagttactcaatgaaataccgag



Exon 24 | Start: 3095 | End: 3192 | Length: 97



    .    .    .    .    .    .    .    .    .    .    .    .
agacccacactgctccatcccctcaggcgtaacacaggatgctgaccccaggaagagtgg

    .    .    .    .    .    .    .    .    .    .    .    .
gcgtagaaaaactagagggcattattgttattctgattcaaatgtacagtgctggcatgg

    .    .    .    .    .    .    .    .    .    .    .    .
tctttaaacagtaaccagtactagctggccaagacagaaaagtctaccacaaagacttgg

    .    .    .    .    .    .    .    .    .    .    .    .
ttctttcatcacttatttgactggaagtgtcgcatcaccaatgccttctttaagcaatgc

    .    .    .    .    .    .    .    .    .    .    .    .
catctttatcatttcttccagtgttctaattgcactgttttttctcattccttcccccagg

   |2851    |2861    |2871    |2881    |2891    |2901
GCTGGATGATAGACGCAGATAGTCGCCCAAAGTTCCGTGAGTTGATCATCGAATTCTCCA
   W   M   I   D   A   D   S   R   P   K   F   R   E   L   I   I   E   F   S   K
   |951                            |961

   |2911    |2921    |2931    |2941    .    .    .    .
AAATGGCCCGAGACCCCCAGCGCTACCTTGTCATTCAGgtacaaattgcagtctgtgctt
   M   A   R   D   P   Q   R   Y   L   V   I   Q
   |971                            |981

    .    .    .    .    .    .    .    .    .    .    .    .
ccattgggaagagtccctctaatgagcatctcatgtcactgtgttctgtcacatgccagc

    .    .    .    .    .    .    .    .    .    .    .    .
ctggcctccctgtgtcccagatcgcattattaaaccctccagcgcattagagcaagcctc

    .    .    .    .    .    .    .    .    .    .    .    .
agtaaggcgcaggccacatcgtgaactaagcagcatccgtgagtggggcccacccaactc

    .    .    .    .    .    .    .    .    .    .    .    .
catctcccccctccccgtctgaactctcctctggtgctcgtcctcactgtccggctagcca
```

```
        .         .         .         .         .         .         .         .
aagcctcagctgggtctaagagagaagcatggtctatt


Exon 25 | Start: 3193 | End: 3360 | Length: 167



    .         .         .         .         .         .         .         .         .         .         .         .
acagcaaggtgcacactcgatgaatgctgcagcttcttccctttctgtttcctcagaagc

    .         .         .         .         .         .         .         .         .         .         .         .
tatttgaatctcatgtaggggctttcaagcatcaaaggatggttcatgttttattttaag

    .         .         .         .         .         .         .         .         .         .         .         .
gcacccacatcatgtcatgaggggaggcagctataatttagagaaccaaggggggatttca

    .         .         .         .         .         .         .         .         .         .         .         .
ttataacaaaattggcaaacacacaggcacctgctggcaatagacccctgctcctatagc

    .         .         .         .         .         .         .         .         .         .         .         .
caagaagtggaatagcatctctacgggccattctaatagcctcaaaatctctgcaccagg

    |2951      |2961      |2971      |2981      |2991      |3001
GGGGATGAAAGAATGCATTTGCCAAGTCCTACAGACTCCAACTTCTACCGTGCCCTGATG
G   D   E   R   M   H   L   P   S   P   T   D   S   N   F   Y   R   A   L   M
                        |991                                       |1001

    |3011      |3021      |3031      |3041      |3051      |3061
GATGAAGAAGACATGGACGACGTGGTGGATGCCGACGAGTACCTCATCCCACAGCAGGGC
D   E   E   D   M   D   D   V   V   D   A   D   E   Y   L   I   P   Q   Q   G
                        |1011                                      |1021

    |3071      |3081      |3091      |3101      |3111    .         .
TTCTTCAGCAGCCCCTCCACGTCACGGACTCCCCTCCTGAGCTCTCTGgtatgaaatctc
F   F   S   S   P   S   T   S   R   T   P   L   L   S   S   L
                        |1031


    .         .         .         .         .         .         .         .         .         .         .         .
tgtctctctctctctctcaagctgtgtctactcatttgaacaaattgaattttagggaaa

    .         .         .         .         .         .         .         .         .         .         .         .
ataaccatctagtgaaactcacatggatatgaagtcaattttaaccaaatggtaaaatca

    .         .         .         .         .         .         .         .         .         .         .         .
```

aaatcaaaataaattaagtgtattaattattttgttgcattgcaacaacttgattgtaag

   .   .   .   .
ccttttaggtccactatggaatgtaattaaatcaaaactaaacctagttgctctaaaact

   .   .   .   .
aacgattaagacaaaaattaaacaccttcacaatataccctccatgag

Exon 26 | Start: 3361 | End: 3408 | Length: 47

  .   .   .   .
ctagtgaaactcacatggatatgaagtcaattttaaccaaatggtaaaatcaaaatcaaa

  .   .   .   .
ataaattaagtgtattaattattttgttgcattgcaacaacttgattgtaagcctttttag

  .   .   .   .
gtccactatggaatgtaattaaatcaaaactaaacctagttgctctaaaactaacgatta

  .   .   .   .
agacaaaaattaaacaccttcacaatataccctccatgaggcacaccacctgcattcagg

  .   .   .   .
aaaagtggatgagatgtggtacaagcattccatgggcaacttctctgtttcttttttcaga

     |3121 |3131 |3141 |3151 |3161 .   .
AGTGCAACCAGCAACAATTCCACCGTGGCTTGCATTGATAGAAATGGGgtatgtatgaac
S A T S N N S T V A C I D R N G
     |1041 |1051

  .   .   .   .
accttataagccagaatttacagctctccactatggctctattttacatggaaaatgcct

  .   .   .   .
taacctaaataattttaacccagataatcttgagttttcttcctgtgtgggttttttccct

  .   .   .   .
gcacggctgtcacgcctcacagtgccgttcaaagcgtgactcctggaccagtagtagcat

  .   .   .   .
cgcctggccttgttagaaacgccattttttcaggccactgccccagtttgaccaaatcagg

28

```
        .         .         .         .         .         .         .
acctctgggggtggcacccagtagtctatgtttgagccactttccagg
```

Exon 27 | Start: 3409 | End: 3517 | Length: 108

```
        .         .         .         .         .         .         .         .
tcacacatgtgaagtgtccagtagccacacgtggctagtggtgaccgtattgaagagcac

        .         .         .         .         .         .         .         .
cgctcatagcacacctccctcactgcggaaagttctgctgtacagcacccagcacagccc

        .         .         .         .         .         .         .         .
tgctgcccaccctgcagcctgtggcccagtagcaccagcacccaccagggtgcagactct

        .         .         .         .         .         .         .         .
caggcctgcccaacctactaatcagaaccagcatctcaaggagatctcgggtgatttttg

        .         .         .         .         .         .         .         .
caaacactgaagttgggggcagccctgaccggagtaaccttccctcatttcctcctgcagc

           |3171      |3181      |3191      |3201      |3211      |3221
CTGCAAAGCTGTCCCATCAAGGAAGACAGCTTCTTGCAGCGATACAGCTCAGACCCCACA
L   Q   S   C   P   I   K   E   D   S   F   L   Q   R   Y   S   S   D   P   T
              |1061                                        |1071

           |3231      |3241      |3251      |3261      |3271.       .
GGCGCCTTGACTGAGGACAGCATAGACGACACCTTCCTCCCAGTGCCTGgtgagtggctt
G   A   L   T   E   D   S   I   D   D   T   F   L   P   V   P   E
              |1081                                        |1091

        .         .         .         .         .         .         .         .
gtctggaaacagtcctgctcctcaacctcctcgacccactcagcagcagccagtctccag

        .         .         .         .         .         .         .         .
tgtccaagccaggtgctccctccagcatctccagaggggggaaacagtggcagatttgcag

        .         .         .         .         .         .         .         .
acacagtgaagggcgtaaggagcagataaacacatgaccgagcctgcacaagctctttgt

        .         .         .         .         .         .         .         .
tgtgtctggttgtttgctgtacctctgttgtaagaatgaatctgcaaaatttctagctta
```

```
                .     .      .     .     .      .     .      .     .     .      .
              tgaagcaaatcacggacatacacatctgtgtgtgtgagtgttcatgatg
```

Exon 28 | Start: 3518 | End: 5600 | Length: 2082

```
        .     .      .     .     .      .     .      .     .     .      .
      cacatcacacatatatgtatacatgcatacacatacacacacacatacacacactctcct

        .     .      .     .     .      .     .      .     .     .      .
      caaggcagtttatcctctgagaactttaaatttacaaaagacacatatgtccattacttt

        .     .      .     .     .      .     .      .     .     .      .
      gagaaggacaggaaagaacccactttcttttgcagcaacagcaagagggccctccccgagg

        .     .      .     .     .      .     .      .     .     .      .
      ctcctgctccctgtcataagtctccttgttgaggacattcacagggttcagaacccaggg

        .     .      .     .     .      .     .      .     .     .      .
      atcctgcatgggatggtgctttgctgattacttcacctctgatttctttccactttcaga
```

```
              |3281      |3291      |3301      |3311      |3321      |3331
      AATACATAAACCAGTCCGTTCCCAAAAGGCCCGCTGGCTCTGTGCAGAATCCTGTCTATC
        Y   I   N   Q   S   V   P   K   R   P   A   G   S   V   Q   N   P   V   Y   H
                                            |1101                                |1111

              |3341      |3351      |3361      |3371      |3381      |3391
      ACAATCAGCCTCTGAACCCCGCGCCCAGCAGAGACCCACACTACCAGGACCCCCACAGCA
        N   Q   P   L   N   P   A   P   S   R   D   P   H   Y   Q   D   P   H   S   T
                                            |1121                                |1131

              |3401      |3411      |3421      |3431      |3441      |3451
      CTGCAGTGGGCAACCCCGAGTATCTCAACACTGTCCAGCCCACCTGTGTCAACAGCACAT
        A   V   G   N   P   E   Y   L   N   T   V   Q   P   T   C   V   N   S   T   F
                                            |1141                                |1151

              |3461      |3471      |3481      |3491      |3501      |3511
      TCGACAGCCCTGCCCACTGGGCCCAGAAAGGCAGCCACCAAATTAGCCTGGACAACCCTG
        D   S   P   A   H   W   A   Q   K   G   S   H   Q   I   S   L   D   N   P   D
                                            |1161                                |1171

              |3521      |3531      |3541      |3551      |3561      |3571
      ACTACCAGCAGGACTTCTTTCCCAAGGAAGCCAAGCCAAATGGCATCTTTAAGGGCTCCA
```

30

```
     Y  Q  Q  D  F  F  P  K  E  A  K  P  N  G  I  F  K  G  S  T
                             |1181                           |1191

        |3581     |3591     |3601     |3611     |3621     |3631
CAGCTGAAAATGCAGAATACCTAAGGGTCGCGCCACAAAGCAGTGAATTTATTGGAGCAT
  A  E  N  A  E  Y  L  R  V  A  P  Q  S  S  E  F  I  G  A  *
                             |1201                           |1211


  |+1       |+11      |+21      |+31      |+41      |+51
GACCACGGAGGATAGTATGAGCCCTAAAAATCCAGACTCTTTCGATACCCAGGACCAAGC



  |+61      |+71      |+81      |+91      |+101     |+111
CACAGCAGGTCCTCCATCCCAACAGCCATGCCCGCATTAGCTCTTAGACCCACAGACTGG

  |+121     |+131     |+141     |+151     |+161     |+171
TTTTGCAACGTTTACACCGACTAGCCAGGAAGTACTTCCACCTCGGGCACATTTTGGGAA

  |+181     |+191     |+201     |+211     |+221     |+231
GTTGCATTCCTTTGTCTTCAAACTGTGAAGCATTTACAGAAACGCATCCAGCAAGAATAT

  |+241     |+251     |+261     |+271     |+281     |+291
TGTCCCTTTGAGCAGAAATTTATCTTTCAAAGAGGTATATTTGAAAAAAAAAAAAAGTAT

  |+301     |+311     |+321     |+331     |+341     |+351
ATGTGAGGATTTTTATTGATTGGGGATCTTGGAGTTTTTCATTGTCGCTATTGATTTTTA

  |+361     |+371     |+381     |+391     |+401     |+411
CTTCAATGGGCTCTTCCAACAAGGAAGAAGCTTGCTGGTAGCACTTGCTACCCTGAGTTC

  |+421     |+431     |+441     |+451     |+461     |+471
ATCCAGGCCCAACTGTGAGCAAGGAGCACAAGCCACAAGTCTTCCAGAGGATGCTTGATT

  |+481     |+491     |+501     |+511     |+521     |+531
CCAGTGGTTCTGCTTCAAGGCTTCCACTGCAAAACACTAAAGATCCAAGAAGGCCTTCAT

  |+541     |+551     |+561     |+571     |+581     |+591
GGCCCCAGCAGGCCGGATCGGTACTGTATCAAGTCATGGCAGGTACAGTAGGATAAGCCA

  |+601     |+611     |+621     |+631     |+641     |+651
CTCTGTCCCTTCCTGGGCAAAGAAGAAACGGAGGGGATGGAATTCTTCCTTAGACTTACT

  |+661     |+671     |+681     |+691     |+701     |+711
TTTGTAAAAATGTCCCCACGGTACTTACTCCCCACTGATGGACCAGTGGTTTCCAGTCAT
```

31

```
|+721       |+731       |+741       |+751       |+761       |+771
GAGCGTTAGACTGACTTGTTTGTCTTCCATTCCATTGTTTTGAAACTCAGTATGCTGCCC

|+781       |+791       |+801       |+811       |+821       |+831
CTGTCTTGCTGTCATGAAATCAGCAAGAGAGGATGACACATCAAATAATAACTCGGATTC

|+841       |+851       |+861       |+871       |+881       |+891
CAGCCCACATTGGATTCATCAGCATTTGGACCAATAGCCCACAGCTGAGAATGTGGAATA

|+901       |+911       |+921       |+931       |+941       |+951
CCTAAGGATAGCACCGCTTTTGTTCTCGCAAAAACGTATCTCCTAATTTGAGGCTCAGAT

|+961       |+971       |+981       |+991       |+1001      |+1011
GAAATGCATCAGGTCCTTTGGGGCATAGATCAGAAGACTACAAAAATGAAGCTGCTCTGA

|+1021      |+1031      |+1041      |+1051      |+1061      |+1071
AATCTCCTTTAGCCATCACCCCAACCCCCCAAAATTAGTTTGTGTTACTTATGGAAGATA

|+1081      |+1091      |+1101      |+1111      |+1121      |+1131
GTTTTCTCCTTTTACTTCACTTCAAAAGCTTTTTACTCAAAGAGTATATGTTCCCTCCAG

|+1141      |+1151      |+1161      |+1171      |+1181      |+1191
GTCAGCTGCCCCCAAACCCCCTCCTTACGCTTTGTCACACAAAAAGTGTCTCTGCCTTGA

|+1201      |+1211      |+1221      |+1231      |+1241      |+1251
GTCATCTATTCAAGCACTTACAGCTCTGGCCACAACAGGGCATTTTACAGGTGCGAATGA

|+1261      |+1271      |+1281      |+1291      |+1301      |+1311
CAGTAGCATTATGAGTAGTGTGGAATTCAGGTAGTAAATATGAAACTAGGGTTTGAAATT

|+1321      |+1331      |+1341      |+1351      |+1361      |+1371
GATAATGCTTTCACAACATTTGCAGATGTTTTAGAAGGAAAAAAGTTCCTTCCTAAAATA

|+1381      |+1391      |+1401      |+1411      |+1421      |+1431
ATTTCTCTACAATTGGAAGATTGGAAGATTCAGCTAGTTAGGAGCCCACCTTTTTTCCTA

|+1441      |+1451      |+1461      |+1471      |+1481      |+1491
ATCTGTGTGTGCCCTGTAACCTGACTGGTTAACAGCAGTCCTTTGTAAACAGTGTTTTAA

|+1501      |+1511      |+1521      |+1531      |+1541      |+1551
ACTCTCCTAGTCAATATCCACCCCATCCAATTTATCAAGGAAGAAATGGTTCAGAAAATA

|+1561      |+1571      |+1581      |+1591      |+1601      |+1611
TTTTCAGCCTACAGTTATGTTCAGTCACACACACATACAAAATGTTCCTTTTGCTTTTAA

|+1621      |+1631      |+1641      |+1651      |+1661      |+1671
```

```
AGTAATTTTTGACTCCCAGATCAGTCAGAGCCCCTACAGCATTGTTAAGAAAGTATTTGA

   |+1681     |+1691     |+1701     |+1711     |+1721     .     .
TTTTTGTCTCAATGAAAATAAAACTATATTCATTTCCACTCTAttatgctctcaaatacc

     .     .     .     .     .     .     .     .     .     .     .     .
cctaagcatctatactagcctggtatgggtatgaaagatacaaagataaataaaacatag

     .     .     .     .     .     .     .     .     .     .     .     .
tccctgattctaagaaattcacaatttagcaaaggaaatggactcatagatgctaacctt

     .     .     .     .     .     .     .     .     .     .     .     .
aaaacaacgtgacaaatgccagacaggacccatcagccaggcactgtgagagcacagagc

     .     .     .     .     .     .     .     .     .     .     .     .
agggaggttgggtcctgcctgaggagacctggaagggaggcctcacaggaggatgaccag

     .     .     .     .     .     .     .     .     .
gtctcagtcagcggggaggtggaaagtgcaggtgcatcagggg
```