Gene: BRCA1 - Sequence: NG_005905.2
Transcript: NM_007294.3 - Protein: NP_009225.1
Date : February 19, 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: 92500 | End: 92713 | Length: 213


```
     .    .    .    .    .    .    .    .    .    .    .    .
  tacttatatttaccgaaactggagacctccattagggcggaaagagtgggggattgggac

     .    .    .    .    .    .    .    .    .    .    .    .
  ctcttcttacgactgctttggacaataggtagcgattctgaccttcgtacagcaattact

     .    .    .    .    .    .    .    .    .    .    .    .
  gtgatgcaataagccgcaactggaagagtagaggctagagggcaggcactttatggcaaa

     .    .    .    .    .    .    .    .    .    .    .    .
  ctcaggtagaattcttcctcttccgtctctttccttttacgtcatccggggggcagactgg

     .    .    .    .    .    .    .    .    .    .    .    .
  gtggccaatccagagccccgagagacgcttggctctttctgtccctcccatcctctgatt

      |-229     |-219     |-209     |-199     |-189     |-179
  GTACCTTGATTTCGTATTCTGAGAGGCTGCTGCTTAGCGGTAGCCCCTTGGTTTCCGTGG

      |-169     |-159     |-149     |-139     |-129     |-119
  CAACGGAAAAGCGCGGGAATTACAGATAAATTAAAACTGCGACTGCGCGGCGTGAGCTCG

      |-109     |-99      |-89      |-79      |-69      |-59
  CTGAGACTTCCTGGACGGGGGACAGGCTGTGGGGTTTCTCAGATAACTGGGCCCCTGCGC

      |-49      |-39      |-29       .    .    .    .    .
  TCAGGAGGCCTTCACCCTCTGCTCTGGGTAAAGgtagtagagtcccgggaaagggacagg

     .    .    .    .    .    .    .    .    .    .    .    .
  gggcccaagtgatgctctggggtactggcgtgggagagtggatttccgaagctgacagat

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

1

```
gggtattctttgacgggggggtaggggcggaacctgagaggcgtaaggcgttgtgaaccct

   .    .    .    .    .    .    .    .    .    .    .    .
ggggagggggggcagtttgtaggtcgcgagggaagcgctgaggatcaggaagggggcactg

   .    .    .    .    .    .    .    .    .    .    .    .
agtgtccgtgggggaatcctcgtgataggaactggaatatgccttgagggggacactatg

   .    .    .    .    .    .    .
tctttaaaaacgtcggctggtcatgaggtcagg
```

Exon 2 | Start: 93868 | End: 93967 | Length: 99

```
   .    .    .    .    .    .    .    .    .    .    .    .
aggctaccaccacctacccggtcagtcactcctctgtagctttctctttcttggagaaag

   .    .    .    .    .    .    .    .    .    .    .    .
gaaaagacccaaggggttggcagcaatatgtgaaaaaattcagaatttatgttgtctaat

   .    .    .    .    .    .    .    .    .    .    .    .
tacaaaaagcaacttctagaatctttaaaaataaaggacgttgtcattagttctttggtt

   .    .    .    .    .    .    .    .    .    .    .    .
tgtattattctaaaaccttccaaatcttaaatttactttattttaaaatgataaaatgaa

   .    .    .    .    .    .    .    .    .    .    .    .
gttgtcattttataaaccttttaaaaagatatatatatgttttttctaatgtgttaaag

|-19       |-9        |1        |11       |21       |31       |41
TTCATTGGAACAGAAAGAAATGGATTTATCTGCTCTTCGCGTTGAAGAAGTACAAAATGT
                    M  D  L  S  A  L  R  V  E  E  V  Q  N  V
                    |1                            |11

        |51       |61       |71          .    .    .    .
CATTAATGCTATGCAGAAAATCTTAGAGTGTCCCATCTGgtaagtcagcacaagagtgta
 I  N  A  M  Q  K  I  L  E  C  P  I  C
                    |21

   .    .    .    .    .    .    .    .    .    .    .    .
ttaatttgggattcctatgattatctcctatgcaaatgaacagaattgaccttacatact

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

2

agggaagaaaagacatgtctagtaagattaggctattgtaattgctgattttcttaactg

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

aagaactttaaaaatatagaaaatgattccttgttctccatccactctgcctctcccact

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

cctctccttttcaacacaaatcctgtggtccgggaaagacagggactctgtcttgattgg

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

ttctgcactggggcaggaatctagtttagattaactggc

Exon 3 | Start: 102204 | End: 102258 | Length: 54


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

aattcgtacgaactattatcaactaatcttttaaatgctgatgatagtatagagtattga

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

agggatcaatataattctgttttgatatctgaaagctcactgaaggtaaggatcgtattc

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

tctgctgtattctcagttcctgacacagcagacatttaataaatattgaacgaacttgag

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

gccttatgttgactcagtcataacagctcaaagttgaacttattcactaagaatagcttt

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

atttttaaataaattattgagcctcatttattttcttttttctcccccccctaccctgctag

```
|81        |91        |101       |111       |121       |131       .
TCTGGAGTTGATCAAGGAACCTGTCTCCACAAAGTGTGACCACATATTTTGCAAgtaagt
 L  E  L  I  K  E  P  V  S  T  K  C  D  H  I  F  C  K
           |31                               |41
```

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

ttgaatgtgttatgtggctccattattagcttttgttttttgtccttcataacccaggaaa

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

cacctaactttatagaagctttactttcttcaattaagtgagaacgaaaaatccaactcc

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

atttcattctttctcagagagtatatagttatcaaaagttggttgtaatcatagttcctg

3

```
          .         .         .         .         .         .         .
       gtaaagttttgacatatattatctttttttttttttttgagacaaagtctcgctctgtcg

          .         .         .         .         .         .         .
       cccaggctggagtgcagtggcatgatcttggctcactgcaacctccgcccccccg


Exon 4 | Start: 111450 | End: 111528 | Length: 78


       .         .         .         .         .         .         .         .
     tatgaatatatcattaaatatgccatattaacttttattaagttttatgtgatcataaca

       .         .         .         .         .         .         .         .
     gtaagccatatgcatgtaagttcagttttcatagatcattgcttatgtagtttaggtttt

       .         .         .         .         .         .         .         .
     tgcttatgcagcatccaaaaacaattaggaaactattgcttgtaattcacctgccattac

       .         .         .         .         .         .         .         .
     tttttaaatggctcttaagggcagttgtgagattatcttttcatggctatttgccttttg

       .         .         .         .         .         .         .         .
     agtattctttctacaaaaggaagtaaattaaattgttctttctttctttataatttatag
          |141       |151       |161       |171       |181       |191
     ATTTTGCATGCTGAAACTTCTCAACCAGAAGAAAGGGCCTTCACAGTGTCCTTTATGTAA
      F  C  M  L  K  L  L  N  Q  K  K  G  P  S  Q  C  P  L  C  K
                    |51                                  |61

          |201       |211   .         .         .         .         .         .
     GAATGATATAACCAAAAGgtatataatttggtaatgatgctaggttggaagcaaccacag
      N  D  I  T  K  R
                    |71


       .         .         .         .         .         .         .         .
     taggaaaaagtagaaattatttaataacatagcgttcctataaaaccattcatcagaaaa

       .         .         .         .         .         .         .         .
     atttataaaagagttttttagcacacagtaaattatttccaaagttattttcctgaaagtt

       .         .         .         .         .         .         .         .
     ttatgggacatctgccttatacaggtattagaaacttactgcctttctctaatgcttcta
```

4

```
         .        .        .        .        .        .        .        .        .
gtgtaaaaacttgcagacttatgtaaagtagggctgtatcgccgtgcccccattgtctgt

         .        .        .        .
taatcttgttttttatatt


Exon 5 | Start: 113027 | End: 113116 | Length: 89


         .        .        .        .        .        .        .        .        .
aaattaaacaaaaaaaaaagtactctagttttctatgcaatgcattatatctgctgtgga

         .        .        .        .        .        .        .        .        .
tttagggcagtattatatcagataattttaggcatttggtaggcttaaatgaatgacaaa

         .        .        .        .        .        .        .        .        .
aagttactaaatcactgccatcacacggtttatacagatgtcaatgatgtattgattata

         .        .        .        .        .        .        .        .        .
gaggttttctactgttgctgcatcttattttttatttgtttacatgtcttttcttatttta

         .        .        .        .        .        .        .        .        .
gtgtccttaaaaggttgataatcacttgctgagtgtgtttctcaaacaatttaatttcag
        |221        |231        |241        |251        |261        |271
GAGCCTACAAGAAAGTACGAGATTTAGTCAACTTGTTGAAGAGCTATTGAAAATCATTTG
  S   L   Q   E   S   T   R   F   S   Q   L   V   E   E   L   L   K   I   I   C
                                |81                                        |91

        |281        |291        |301 .        .        .        .        .        .
TGCTTTTCAGCTTGACACAGGTTTGGAGTgtaagtgttgaatatcccaagaatgacactc
  A   F   Q   L   D   T   G   L   E   Y
                                |101


         .        .        .        .        .        .        .        .        .
aagtgctgtccatgaaaactcaggaagtttgcacaattactttctatgacgtggtgataa

         .        .        .        .        .        .        .        .        .
gaccttttagtctaggttaattttagttctgtatctgtaatctattttttaaaaaattact

         .        .        .        .        .        .        .        .        .
cccactggtctcacaccttattttatcaatcgtaaggtgcacattttttcacatcttaaca
```

5

```
        .       .       .       .       .       .       .       .       .       .
    tctctgaaattgggaacattttactattgagggtgtgtcatttgtttaatttgtgtgctt

        .       .       .       .       .       .
    tctttcttagtgatacagaaaataatagt


Exon 6 | Start: 113722 | End: 113862 | Length: 140


        .       .       .       .       .       .       .       .       .       .
    tacattgttggtgtcttagctttagtgaaatacagtattgataggcaaatttcttagtgt

        .       .       .       .       .       .       .       .       .       .
    taaggtagaaaacaaggactctaaataactttgatggtctgtgtatttgttttttgtttcc

        .       .       .       .       .       .       .       .       .       .
    taggagtaaaatttccagttgatttttttaaaatttgatttttaaaaaaaatcacaggtaa

        .       .       .       .       .       .       .       .       .       .
    ccttaatgcattgtcttaacacaacaaagagcatacatagggtttctcttggtttctttg

        .       .       .       .       .       .       .       .       .       .
    attataattcatacattttttctctaactgcaaacataatgttttcccttgtattttacag
            |311       |321       |331       |341       |351       |361
    ATGCAAACAGCTATAATTTTGCAAAAAAGGAAAATAACTCTCCTGAACATCTAAAAGATG
      A   N   S   Y   N   F   A   K   K   E   N   N   S   P   E   H   L   K   D   E
                                          |111                               |121

            |371       |381       |391       |401       |411       |421
    AAGTTTCTATCATCCAAAGTATGGGCTACAGAAACCGTGCCAAAAGACTTCTACAGAGTG
      V   S   I   I   Q   S   M   G   Y   R   N   R   A   K   R   L   L   Q   S   E
                                          |131                               |141

            |431       |441 .     .       .       .       .       .       .
    AACCCGAAAATCCTTCCTTGgtaaaaccatttgttttcttcttcttcttcttcttctttt
      P   E   N   P   S   L


        .       .       .       .       .       .       .       .       .       .
    cttttttttttctttttttttttttgagatggagtcttgctctgtggcccaggctagaagc

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

6

```
agtcctcctgccttagccccccttagtagctgggattacaggcacgcgccaccatgccagg

   .     .     .     .     .     .     .     .     .     .     .     .
ctaattttttgtattttttagtagagacggggtttcatcatgttggccaggctggtctcgaa

   .     .     .     .     .     .     .     .     .     .     .     .
ctcctaacctcaggtgatccacccacctcggctccccaaattgctgggattacaggtgtg

   .     .     .     .
agccactgtgcccggccggt
```

Exon 7 | Start: 118103 | End: 118209 | Length: 106

```
   .     .     .     .     .     .     .     .     .     .     .     .
actactactattattttgtagagactgggtctcactctgttgcttatgctggtcttgaac

   .     .     .     .     .     .     .     .     .     .     .     .
tcctggcctcaagcagtcctgctccagcctcccaaagtgctgggattataggcatgagct

   .     .     .     .     .     .     .     .     .     .     .     .
accgctcccagccccagacatttttagtgtgtaaattcctgggcatttttttccaggcatca

   .     .     .     .     .     .     .     .     .     .     .     .
tacatgttagctgactgatgatggtcaatttatttttgtccatggtgtcaagtttctcttc

   .     .     .     .     .     .     .     .     .     .     .     .
aggaggaaaagcacagaactggccaacaattgcttgactgttctttaccatactgtttag
```

```
          |451       |461       |471       |481       |491       |501
CAGGAAACCAGTCTCAGTGTCCAACTCTCTAACCTTGGAACTGTGAGAACTCTGAGGACA
 Q   E   T   S   L   S   V   Q   L   S   N   L   G   T   V   R   T   L   R   T
          |151                           |161
```

```
          |511       |521       |531       |541          .     .
AAGCAGCGGATACAACCTCAAAAGACGTCTGTCTACATTGAATTGGgtaagggtctcagg
 K   Q   R   I   Q   P   Q   K   T   S   V   Y   I   E   L   G
          |171                           |181
```

```
   .     .     .     .     .     .     .     .     .     .     .     .
tttttaagtatttaataataattgctggattccttatcttatagttttgccaaaaatct

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

7

```
tggtcataatttgtatttgtggtaggcagctttgggaagtgaattttatgagccctatgg

   .        .        .        .        .        .        .        .        .        .        .        .
tgagttataaaaaatgtaaaagacgcagttcccaccttgaagaatcttactttaaaaagg

   .        .        .        .        .        .        .        .        .        .        .        .
gagcaaaagaggccaggcatggtggctcacacctgtaatcccagcactttgggaggccaa

   .        .        .        .        .        .        .        .        .        .
agtgggtggatcacctgaggtcgggagttcgagaccagcctagcca
```

Exon 8 | Start: 120694 | End: 120740 | Length: 46

```
   .        .        .        .        .        .        .        .        .        .        .        .
tagaaacggggggtctcactttgttggccaggctggtcttgaactcctaacctcaaataat

   .        .        .        .        .        .        .        .        .        .        .        .
ccacccatctcggcctcctcaagtgctgggattacaggtgagagccactgtgcctggcga

   .        .        .        .        .        .        .        .        .        .        .        .
agcccatgcctttaaccacttctctgtattacatactagcttaactagcattgtacctgc

   .        .        .        .        .        .        .        .        .        .        .        .
cacagtagatgctcagtaaatatttctagttgaatatctgttttttcaacaagtacatttt

   .        .        .        .        .        .        .        .        .        .        .        .
tttaacccttttaattaagaaaacttttattgatttattttttgggggggaaatttttttag
     |551          |561          |571          |581          |591        .        .
GATCTGATTCTTCTGAAGATACCGTTAATAAGGCAACTTATTGCAGgtgagtcaaagaga
   S   D   S   S   E   D   T   V   N   K   A   T   Y   C   S
                         |191

   .        .        .        .        .        .        .        .        .        .        .        .
acctttgtctatgaagctggtattttcctatttagttaatattaaggattgatgtttctc

   .        .        .        .        .        .        .        .        .        .        .        .
tcttttaaaaatattttaacttttattttaggttcagggatgtatgtgcagtttgttat

   .        .        .        .        .        .        .        .        .        .        .        .
ataggtaaacacacgacttgggatttggtgtatagatttttttcatcatccgggtactaa
```

```
         .         .         .         .         .         .
    gcataccccacagttttttgtttgctttctttctgaatttctccctcttcccaccttcct

         .         .         .         .         .         .
    ccctcaagtaggctggtgtttctccagactagaatcatggtattgg



    Exon 9 | Start: 122061 | End: 122138 | Length: 77



         .         .         .         .         .         .
    gtattttagtagagatggggtttcaccatgttggccaggctggtcttgaactcatgacc

         .         .         .         .         .         .
    tcaagtggtccacccgcctcagcctcccaaagtgctggaattacaggcttgagccaccgt

         .         .         .         .         .         .
    gcccagcaaccatttcatttcaactagaagtttctaaaggagagagcagctttcactaac

         .         .         .         .         .         .
    taaataagattggtcagctttctgtaatcgaaagagctaaaatgtttgatcttggtcatt

         .         .         .         .         .         .
    tgacagttctgcatacatgtaactagtgtttcttattaggactctgtctttttccctatag
            |601       |611       |621       |631       |641       |651
    TGTGGGAGATCAAGAATTGTTACAAATCACCCCTCAAGGAACCAGGGATGAAATCAGTTT
      V   G   D   Q   E   L   L   Q   I   T   P   Q   G   T   R   D   E   I   S   L
            |201                               |211


            |661       .         .         .         .         .         .
    GGATTCTGCAAAAAAGGgtaatggcaaagtttgccaacttaacaggcactgaaaagagag
      D   S   A   K   K   A
            |221


         .         .         .         .         .         .
    tgggtagatacagtactgtaattagattattctgaagaccatttgggacctttacaaccc

         .         .         .         .         .         .
    acaaaatctcttggcagagttagagtatcattctctgtcaaatgtcgtggtatggtctga

         .         .         .         .         .         .
    tagatttaaatggtactagactaatgtacctataataagaccttctgtaactgattgttg
```

9

```
        .    .    .    .    .    .    .    .    .    .    .    .
    ccctttcgtttttttttttgtttgtttgtttgttttttttttgagatggggtctcactctg

        .    .    .    .
    ttgcccaggctggagtg


Exon 10 | Start: 123123 | End: 126549 | Length: 3426


        .    .    .    .    .    .    .    .    .    .    .    .
    agttttctgatggccaatctgcttttaattcactcttagacgttagagaaataggtgtgg

        .    .    .    .    .    .    .    .    .    .    .    .
    tttctgcatagggaaaattctgaaattaaaaatttaatggatcctaagtggaaataatct

        .    .    .    .    .    .    .    .    .    .    .    .
    aggtaaataggaattaaatgaaagagtatgagctacatcttcagtatacttggtagttta

        .    .    .    .    .    .    .    .    .    .    .    .
    tgaggttagtttctctaatatagccagttggttgatttccacctccaaggtgtatgaagt

        .    .    .    .    .    .    .    .    .    .    .    .
    atgtattttttttaatgacaattcagttttttgagtaccttgttattttttgtatattttcag

    |671       |681       |691       |701       |711       |721
    CTGCTTGTGAATTTTCTGAGACGGATGTAACAAATACTGAACATCATCAACCCAGTAATA
      A   C   E   F   S   E   T   D   V   T   N   T   E   H   H   Q   P   S   N   N
                          |231                               |241

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

    |791       |801       |811       |821       |831       |841
    GTTCTGTTTCAAACTTGCATGTGGAGCCATGTGGCACAAATACTCATGCCAGCTCATTAC
      S   V   S   N   L   H   V   E   P   C   G   T   N   T   H   A   S   S   L   Q
                          |271                               |281

    |851       |861       |871       |881       |891       |901
    AGCATGAGAACAGCAGTTTATTACTCACTAAAGACAGAATGAATGTAGAAAAGGCTGAAT
      H   E   N   S   S   L   L   L   T   K   D   R   M   N   V   E   K   A   E   F
                          |291                               |301
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|911       |921       |931       |941       |951       |961
TCTGTAATAAAAGCAAACAGCCTGGCTTAGCAAGGAGCCAACATAACAGATGGGCTGGAA
  C  N  K  S  K  Q  P  G  L  A  R  S  Q  H  N  R  W  A  G  S
                |311                               |321


|971       |981       |991       |1001      |1011      |1021
GTAAGGAAACATGTAATGATAGGCGGACTCCCAGCACAGAAAAAAAGGTAGATCTGAATG
  K  E  T  C  N  D  R  R  T  P  S  T  E  K  K  V  D  L  N  A
                |331                               |341


|1031     |1041      |1051      |1061      |1071      |1081
CTGATCCCCTGTGTGAGAGAAAAGAATGGAATAAGCAGAAACTGCCATGCTCAGAGAATC
  D  P  L  C  E  R  K  E  W  N  K  Q  K  L  P  C  S  E  N  P
                |351                               |361


|1091     |1101      |1111      |1121      |1131      |1141
CTAGAGATACTGAAGATGTTCCTTGGATAACACTAAATAGCAGCATTCAGAAAGTTAATG
  R  D  T  E  D  V  P  W  I  T  L  N  S  S  I  Q  K  V  N  E
                |371                               |381


|1151     |1161      |1171      |1181      |1191      |1201
AGTGGTTTTCCAGAAGTGATGAACTGTTAGGTTCTGATGACTCACATGATGGGGAGTCTG
  W  F  S  R  S  D  E  L  L  G  S  D  D  S  H  D  G  E  S  E
                |391                               |401


|1211     |1221      |1231      |1241      |1251      |1261
AATCAAATGCCAAAGTAGCTGATGTATTGGACGTTCTAAATGAGGTAGATGAATATTCTG
  S  N  A  K  V  A  D  V  L  D  V  L  N  E  V  D  E  Y  S  G
                |411                               |421


|1271     |1281      |1291      |1301      |1311      |1321
GTTCTTCAGAGAAAATAGACTTACTGGCCAGTGATCCTCATGAGGCTTTAATATGTAAAA
  S  S  E  K  I  D  L  L  A  S  D  P  H  E  A  L  I  C  K  S
                |431                               |441


|1331     |1341      |1351      |1361      |1371      |1381
GTGAAAGAGTTCACTCCAAATCAGTAGAGAGTAATATTGAAGACAAAATATTTGGGAAAA
  E  R  V  H  S  K  S  V  E  S  N  I  E  D  K  I  F  G  K  T
                |451                               |461


|1391     |1401      |1411      |1421      |1431      |1441
CCTATCGGAAGAAGGCAAGCCTCCCCAACTTAAGCCATGTAACTGAAAATCTAATTATAG
  Y  R  K  K  A  S  L  P  N  L  S  H  V  T  E  N  L  I  I  G
                |471                               |481
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|1451      |1461      |1471      |1481      |1491      |1501
GAGCATTTGTTACTGAGCCACAGATAATACAAGAGCGTCCCCTCACAAATAAATTAAAGC
  A  F  V  T  E  P  Q  I  I  Q  E  R  P  L  T  N  K  L  K  R
                        |491                        |501


|1511      |1521      |1531      |1541      |1551      |1561
GTAAAAGGAGACCTACATCAGGCCTTCATCCTGAGGATTTTATCAAGAAAGCAGATTTGG
  K  R  R  P  T  S  G  L  H  P  E  D  F  I  K  K  A  D  L  A
                        |511                        |521


|1571      |1581      |1591      |1601      |1611      |1621
CAGTTCAAAAGACTCCTGAAATGATAAATCAGGGAACTAACCAAACGGAGCAGAATGGTC
  V  Q  K  T  P  E  M  I  N  Q  G  T  N  Q  T  E  Q  N  G  Q
                        |531                        |541


|1631      |1641      |1651      |1661      |1671      |1681
AAGTGATGAATATTACTAATAGTGGTCATGAGAATAAAACAAAAGGTGATTCTATTCAGA
  V  M  N  I  T  N  S  G  H  E  N  K  T  K  G  D  S  I  Q  N
                        |551                        |561


|1691      |1701      |1711      |1721      |1731      |1741
ATGAGAAAAATCCTAACCCAATAGAATCACTCGAAAAAGAATCTGCTTTCAAAACGAAAG
  E  K  N  P  N  P  I  E  S  L  E  K  E  S  A  F  K  T  K  A
                        |571                        |581


|1751      |1761      |1771      |1781      |1791      |1801
CTGAACCTATAAGCAGCAGTATAAGCAATATGGAACTCGAATTAAATATCCACAATTCAA
  E  P  I  S  S  S  I  S  N  M  E  L  E  L  N  I  H  N  S  K
                        |591                        |601


|1811      |1821      |1831      |1841      |1851      |1861
AAGCACCTAAAAAGAATAGGCTGAGGAGGAAGTCTTCTACCAGGCATATTCATGCGCTTG
  A  P  K  K  N  R  L  R  R  K  S  S  T  R  H  I  H  A  L  E
                        |611                        |621


|1871      |1881      |1891      |1901      |1911      |1921
AACTAGTAGTCAGTAGAAATCTAAGCCCACCTAATTGTACTGAATTGCAAATTGATAGTT
  L  V  V  S  R  N  L  S  P  P  N  C  T  E  L  Q  I  D  S  C
                        |631                        |641


|1931      |1941      |1951      |1961      |1971      |1981
GTTCTAGCAGTGAAGAGATAAAGAAAAAAAAGTACAACCAAATGCCAGTCAGGCACAGCA
  S  S  S  E  E  I  K  K  K  K  Y  N  Q  M  P  V  R  H  S  R
                        |651                        |661


|1991      |2001      |2011      |2021      |2031      |2041
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GAAACCTACAACTCATGGAAGGTAAAGAACCTGCAACTGGAGCCAAGAAGAGTAACAAGC
  N   L   Q   L   M   E   G   K   E   P   A   T   G   A   K   K   S   N   K   P
                  |671                           |681


|2051    |2061    |2071    |2081    |2091    |2101
CAAATGAACAGACAAGTAAAAGACATGACAGCGATACTTTCCCAGAGCTGAAGTTAACAA
  N   E   Q   T   S   K   R   H   D   S   D   T   F   P   E   L   K   L   T   N
                  |691                           |701


|2111    |2121    |2131    |2141    |2151    |2161
ATGCACCTGGTTCTTTTACTAAGTGTTCAAATACCAGTGAACTTAAAGAATTTGTCAATC
  A   P   G   S   F   T   K   C   S   N   T   S   E   L   K   E   F   V   N   P
                  |711                           |721


|2171    |2181    |2191    |2201    |2211    |2221
CTAGCCTTCCAAGAGAAGAAAAAGAAGAGAAACTAGAAACAGTTAAAGTGTCTAATAATG
  S   L   P   R   E   E   K   E   E   K   L   E   T   V   K   V   S   N   N   A
                  |731                           |741


|2231    |2241    |2251    |2261    |2271    |2281
CTGAAGACCCCAAAGATCTCATGTTAAGTGGAGAAAGGGTTTTGCAAACTGAAAGATCTG
  E   D   P   K   D   L   M   L   S   G   E   R   V   L   Q   T   E   R   S   V
                  |751                           |761


|2291    |2301    |2311    |2321    |2331    |2341
TAGAGAGTAGCAGTATTTCATTGGTACCTGGTACTGATTATGGCACTCAGGAAAGTATCT
  E   S   S   S   I   S   L   V   P   G   T   D   Y   G   T   Q   E   S   I   S
                  |771                           |781


|2351    |2361    |2371    |2381    |2391    |2401
CGTTACTGGAAGTTAGCACTCTAGGGAAGGCAAAAACAGAACCAAATAAATGTGTGAGTC
  L   L   E   V   S   T   L   G   K   A   K   T   E   P   N   K   C   V   S   Q
                  |791                           |801


|2411    |2421    |2431    |2441    |2451    |2461
AGTGTGCAGCATTTGAAAACCCCAAGGGACTAATTCATGGTTGTTCCAAAGATAATAGAA
  C   A   A   F   E   N   P   K   G   L   I   H   G   C   S   K   D   N   R   N
                  |811                           |821


|2471    |2481    |2491    |2501    |2511    |2521
ATGACACAGAAGGCTTTAAGTATCCATTGGGACATGAAGTTAACCACAGTCGGGAAACAA
  D   T   E   G   F   K   Y   P   L   G   H   E   V   N   H   S   R   E   T   S
                  |831                           |841


|2531    |2541    |2551    |2561    |2571    |2581
GCATAGAAATGGAAGAAAGTGAACTTGATGCTCAGTATTTGCAGAATACATTCAAGGTTT
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      I   E   M   E   E   S   E   L   D   A   Q   Y   L   Q   N   T   F   K   V   S
                          |851                              |861

|2591     |2601     |2611     |2621     |2631     |2641
CAAAGCGCCAGTCATTTGCTCCGTTTTCAAATCCAGGAAATGCAGAAGAGGAATGTGCAA
    K   R   Q   S   F   A   P   F   S   N   P   G   N   A   E   E   E   C   A   T
                          |871                              |881

|2651     |2661     |2671     |2681     |2691     |2701
CATTCTCTGCCCACTCTGGGTCCTTAAAGAAACAAAGTCCAAAAGTCACTTTTGAATGTG
    F   S   A   H   S   G   S   L   K   K   Q   S   P   K   V   T   F   E   C   E
                          |891                              |901

|2711     |2721     |2731     |2741     |2751     |2761
AACAAAAGGAAGAAAATCAAGGAAAGAATGAGTCTAATATCAAGCCTGTACAGACAGTTA
    Q   K   E   E   N   Q   G   K   N   E   S   N   I   K   P   V   Q   T   V   N
                          |911                              |921

|2771     |2781     |2791     |2801     |2811     |2821
ATATCACTGCAGGCTTTCCTGTGGTTGGTCAGAAAGATAAGCCAGTTGATAATGCCAAAT
    I   T   A   G   F   P   V   V   G   Q   K   D   K   P   V   D   N   A   K   C
                          |931                              |941

|2831     |2841     |2851     |2861     |2871     |2881
GTAGTATCAAAGGAGGCTCTAGGTTTTGTCTATCATCTCAGTTCAGAGGCAACGAAACTG
    S   I   K   G   G   S   R   F   C   L   S   S   Q   F   R   G   N   E   T   G
                          |951                              |961

|2891     |2901     |2911     |2921     |2931     |2941
GACTCATTACTCCAAATAAACATGGACTTTTACAAAACCCATATCGTATACCACCACTTT
    L   I   T   P   N   K   H   G   L   L   Q   N   P   Y   R   I   P   P   L   F
                          |971                              |981

|2951     |2961     |2971     |2981     |2991     |3001
TTCCCATCAAGTCATTTGTTAAAAACTAAATGTAAGAAAAATCTGCTAGAGGAAAACTTTG
    P   I   K   S   F   V   K   T   K   C   K   K   N   L   L   E   E   N   F   E
                          |991                              |1001

|3011     |3021     |3031     |3041     |3051     |3061
AGGAACATTCAATGTCACCTGAAAGAGAAATGGGAAATGAGAACATTCCAAGTACAGTGA
    E   H   S   M   S   P   E   R   E   M   G   N   E   N   I   P   S   T   V   S
                          |1011                             |1021

|3071     |3081     |3091     |3101     |3111     |3121
GCACAATTAGCCGTAATAACATTAGAGAAAATGTTTTTAAAGAAGCCAGCTCAAGCAATA
    T   I   S   R   N   N   I   R   E   N   V   F   K   E   A   S   S   S   N   I
```

14

|3131 |3141 |3151 |3161 |3171 |3181
TTAATGAAGTAGGTTCCAGTACTAATGAAGTGGGCTCCAGTATTAATGAAATAGGTTCCA
  N   E   V   G   S   S   T   N   E   V   G   S   S   I   N   E   I   G   S   S
                          |1051 |1061

|3191 |3201 |3211 |3221 |3231 |3241
GTGATGAAAACATTCAAGCAGAACTAGGTAGAAACAGAGGGCCAAAATTGAATGCTATGC
  D   E   N   I   Q   A   E   L   G   R   N   R   G   P   K   L   N   A   M   L
                          |1071 |1081

|3251 |3261 |3271 |3281 |3291 |3301
TTAGATTAGGGGTTTTGCAACCTGAGGTCTATAAACAAAGTCTTCCTGGAAGTAATTGTA
  R   L   G   V   L   Q   P   E   V   Y   K   Q   S   L   P   G   S   N   C   K
                          |1091 |1101

|3311 |3321 |3331 |3341 |3351 |3361
AGCATCCTGAAATAAAAAAAGCAAGAATATGAAGAAGTAGTTCAGACTGTTAATACAGATT
  H   P   E   I   K   K   Q   E   Y   E   E   V   V   Q   T   V   N   T   D   F
                          |1111 |1121

|3371 |3381 |3391 |3401 |3411 |3421
TCTCTCCATATCTGATTTCAGATAACTTAGAACAGCCTATGGGAAGTAGTCATGCATCTC
  S   P   Y   L   I   S   D   N   L   E   Q   P   M   G   S   S   H   A   S   Q
                          |1131 |1141

|3431 |3441 |3451 |3461 |3471 |3481
AGGTTTGTTCTGAGACACCTGATGACCTGTTAGATGATGGTGAAATAAAGGAAGATACTA
  V   C   S   E   T   P   D   D   L   L   D   D   G   E   I   K   E   D   T   S
                          |1151 |1161

|3491 |3501 |3511 |3521 |3531 |3541
GTTTTGCTGAAAATGACATTAAGGAAAGTTCTGCTGTTTTTAGCAAAAGCGTCCAGAAAG
  F   A   E   N   D   I   K   E   S   S   A   V   F   S   K   S   V   Q   K   G
                          |1171 |1181

|3551 |3561 |3571 |3581 |3591 |3601
GAGAGCTTAGCAGGAGTCCTAGCCCTTTCACCCATACACATTTGGCTCAGGGTTACCGAA
  E   L   S   R   S   P   S   P   F   T   H   T   H   L   A   Q   G   Y   R   R
                          |1191 |1201

|3611 |3621 |3631 |3641 |3651 |3661
GAGGGGCCAAGAAATTAGAGTCCTCAGAAGAGAACTTATCTAGTGAGGATGAAGAGCTTC
  G   A   K   K   L   E   S   S   E   E   N   L   S   S   E   D   E   E   L   P
                          |1211 |1221

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|3671      |3681      |3691      |3701      |3711      |3721
CCTGCTTCCAACACTTGTTATTTGGTAAAGTAAACAATATACCTTCTCAGTCTACTAGGC
  C  F  Q  H  L  L  F  G  K  V  N  N  I  P  S  Q  S  T  R  H
                  |1231                              |1241

|3731      |3741      |3751      |3761      |3771      |3781
ATAGCACCGTTGCTACCGAGTGTCTGTCTAAGAACACAGAGGAGAATTTATTATCATTGA
  S  T  V  A  T  E  C  L  S  K  N  T  E  E  N  L  L  S  L  K
                  |1251                              |1261

|3791      |3801      |3811      |3821      |3831      |3841
AGAATAGCTTAAATGACTGCAGTAACCAGGTAATATTGGCAAAGGCATCTCAGGAACATC
  N  S  L  N  D  C  S  N  Q  V  I  L  A  K  A  S  Q  E  H  H
                  |1271                              |1281

|3851      |3861      |3871      |3881      |3891      |3901
ACCTTAGTGAGGAAACAAAATGTTCTGCTAGCTTGTTTTCTTCACAGTGCAGTGAATTGG
  L  S  E  E  T  K  C  S  A  S  L  F  S  S  Q  C  S  E  L  E
                  |1291                              |1301

|3911      |3921      |3931      |3941      |3951      |3961
AAGACTTGACTGCAAATACAAACACCCAGGATCCTTTCTTGATTGGTTCTTCCAAACAAA
  D  L  T  A  N  T  N  T  Q  D  P  F  L  I  G  S  S  K  Q  M
                  |1311                              |1321

|3971      |3981      |3991      |4001      |4011      |4021
TGAGGCATCAGTCTGAAAGCCAGGGAGTTGGTCTGAGTGACAAGGAATTGGTTTCAGATG
  R  H  Q  S  E  S  Q  G  V  G  L  S  D  K  E  L  V  S  D  D
                  |1331                              |1341

|4031      |4041      |4051      |4061      |4071      |4081
ATGAAGAAAGAGGAACGGGCTTGGAAGAAAATAATCAAGAAGAGCAAAGCATGGATTCAA
  E  E  R  G  T  G  L  E  E  N  N  Q  E  E  Q  S  M  D  S  N
                  |1351                              |1361

|4091      .    .    .    .    .    .    .    .    .    .
ACTTAGgtattggaaccaggtttttgtgtttgccccagtctatttatagaagtgagctaa
  L  G


   .    .    .    .    .    .    .    .    .    .    .    .
atgtttatgcttttggggagcacattttacaaatttccaagtatagttaaaggaactgct

   .    .    .    .    .    .    .    .    .    .    .    .
tcttaaacttgaaacatgttcctcctaaggtgcttttcatagaaaaaagtccttcacaca
```

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```
        .         .         .         .         .         .         .         .         .         .         .         .
gctaggacgtcatctttgactgaatgagctttaacatcctaattactggtggacttactt

        .         .         .         .         .         .         .         .         .         .         .         .
ctggtttcattttataaaagcaaatccaggtgtcccaaagcaaggaatttaatcattttg

        .         .
tgtgac
```

Exon 11 | Start: 126951 | End: 127040 | Length: 89

```
        .         .         .         .         .         .         .         .         .         .         .         .
aaaggaactgcttcttaaacttgaaacatgttcctcctaaggtgcttttcatagaaaaaa

        .         .         .         .         .         .         .         .         .         .         .         .
gtccttcacacagctaggacgtcatctttgactgaatgagctttaacatcctaattactg

        .         .         .         .         .         .         .         .         .         .         .         .
gtggacttacttctggtttcattttataaaagcaaatccaggtgtcccaaagcaaggaat

        .         .         .         .         .         .         .         .         .         .         .         .
ttaatcattttgtgtgacatgaaagtaaatccagtcctgccaatgagaagaaaaagacac

        .         .         .         .         .         .         .         .         .         .         .         .
agcaagttgcagcgtttatagtctgcttttacatctgaacctctgttttttgttatttaag

    |4101      |4111      |4121      |4131      |4141      |4151
GTGAAGCAGCATCTGGGTGTGAGAGTGAAACAAGCGTCTCTGAAGACTGCTCAGGGCTAT
  E   A   A   S   G   C   E   S   E   T   S   V   S   E   D   C   S   G   L   S
              |1371                                      |1381

    |4161      |4171      |4181      .         .         .         .         .         .
CCTCTCAGAGTGACATTTTAACCACTCAGgtaaaaagcgtgtgtgtgtgtgcacatgcgt
  S   Q   S   D   I   L   T   T   Q
              |1391

        .         .         .         .         .         .         .         .         .         .         .         .
gtgtgtggtgtcctttgcattcagtagtatgtatcccacattcttaggtttgctgacatc

        .         .         .         .         .         .         .         .         .         .         .         .
atctctttgaattaatggcacaattgtttgtggttcattgtctccttaaattagactgta
```

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        .         .         .         .         .         .         .
agcaccttgatggaactcatactaccttttatttcacacacacgcacacgcgcacacaca

        .         .         .         .         .         .         .
gcctacacatacactgcctagctcattgtagcatactaaatactgattttaatgaataag

        .         .         .         .         .
ctaaaccttcgaaacccatttgctaatcc
```

Exon 12 | Start: 135408 | End: 135580 | Length: 172

```
      .         .         .         .         .         .         .         .
tatttttttcactccctagctttaaaagaaaataaccaacttcaaaaggacatcacaataa

      .         .         .         .         .         .         .         .
catcaagtctatttgggggaatttgaggattttttccctcactaacatcatttggaaata

      .         .         .         .         .         .         .         .
atttcatgggcattaattgcatgaatgtggttagattaaaaggtgttcagctagaacttg

      .         .         .         .         .         .         .         .
tagttccatactaggtgatttcaattcctgtgctaaaattaatttgtatgatatattttc

      .         .         .         .         .         .         .         .
atttaatggaaagcttctcaaagtatttcattttcttggtgccatttatcgttttttgaag
```

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    |4191      |4201      |4211      |4221      |4231      |4241
CAGAGGGATACCATGCAACATAACCTGATAAAGCTCCAGCAGGAAATGGCTGAACTAGAA
Q   R   D   T   M   Q   H   N   L   I   K   L   Q   Q   E   M   A   E   L   E
            |1401                                  |1411

    |4251      |4261      |4271      |4281      |4291      |4301
GCTGTGTTAGAACAGCATGGGAGCCAGCCTTCTAACAGCTACCCTTCCATCATAAGTGAC
A   V   L   E   Q   H   G   S   Q   P   S   N   S   Y   P   S   I   I   S   D
            |1421                                  |1431

    |4311      |4321      |4331      |4341      |4351              .
TCTTCTGCCCCTTGAGGACCTGCGAAATCCAGAACAAAGCACATCAGAAAAAGgtgtgtat
S   S   A   L   E   D   L   R   N   P   E   Q   S   T   S   E   K   A
            |1441                                  |1451
```

```
      .         .         .         .         .         .         .
tgttggccaaacactgatatcttaagcaaaattctttccttcccctttatctccttctga

      .         .         .         .         .         .         .
agagtaaggacctagctccaacattttatgatccttgctcagcacatgggtaattatgga

      .         .         .         .         .         .         .
gccttggttcttgtccctgctcacaactaatataccagtcagagggacccaaggcagtca

      .         .         .         .         .         .         .
ttcatgttgtcatctgagtacctacaacaagtagatgctatggggagcccatggaagata

      .         .         .         .         .         .         .
catggtatacaacatagctcttgctctattggaagctaagtggaatgggaga
```

Exon 13 | Start: 141369 | End: 141496 | Length: 127

```
      .         .         .         .         .         .         .
tcagggccaaggaatatagatttttttttttcagccttgtctcagctgggtgtctttattt

      .         .         .         .         .         .         .
actctgtcttaaagtgttccttttattatcattattattttttaatcattgaattccatt

      .         .         .         .         .         .         .
tggtgctagcatctgtctgttgcattgcttgtgtttataaaattctgcctgatatacttg

      .         .         .         .         .         .         .
tttaaaaaccaatttgtgtatcatagattgatgcttttgaaaaaaatcagtattctaacc

      .         .         .         .         .         .         .
tgaattatcactatcagaacaaagcagtaaagtagatttgttttctcattccatttaaag
```

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    |4361      |4371      |4381      |4391      |4401      |4411
CAGTATTAACTTCACAGAAAAGTAGTGAATACCCTATAAGCCAGAATCCAGAAGGCCTTT
  V  L  T  S  Q  K  S  S  E  Y  P  I  S  Q  N  P  E  G  L  S
                        |1461                            |1471

    |4421      |4431      |4441      |4451      |4461      |4471
CTGCTGACAAGTTTGAGGTGTCTGCAGATAGTTCTACCAGTAAAAATAAAGAACCAGGAG
  A  D  K  F  E  V  S  A  D  S  S  T  S  K  N  K  E  P  G  V
                        |1481                            |1491
```

```
    |4481       .      .      .      .      .      .      .      .      .      .
TGGAAAGgtaagaaacatcaatgtaaagatgctgtggtatctgacatctttatttatatt
  E  R


            .      .      .      .      .      .      .      .      .      .      .
gaactctgattgttaattttttttcaccatactttctccagttttttgcatacaggcattt

            .      .      .      .      .      .      .      .      .      .      .
atacacttttattgctctaggatacttcttttgtttaatcctatataggttttttgaacc

            .      .      .      .      .      .      .      .      .      .      .
tataacataagctacaacatgagaaatgtgcggttagatagatatgtcccttctgaaggt

            .      .      .      .      .      .      .      .      .      .      .
cagaaaaaaatataatggaggtaaaacctgaacaagcttggaaactgatggtagacttct

            .      .
tcaaggc


Exon 14 | Start: 143462 | End: 143653 | Length: 191


            .      .      .      .      .      .      .      .      .      .      .
agcctcccgagtagctgagattacaggcgccagccaccacacccagctactgacctgctt

            .      .      .      .      .      .      .      .      .      .      .
ttaaacagctgggagatatggtgcctcagaccaacccaaccccatgttatatgtcaaccc

            .      .      .      .      .      .      .      .      .      .      .
tgacatattggcaggcaacatgaatccagacttctaggctgtcttgcgggctctttttttg

            .      .      .      .      .      .      .      .      .      .      .
ccagtcatttctgatctctctgacatgagctgtttcatttatgctttggctgcccagcaa

            .      .      .      .      .      .      .      .      .      .      .
gtatgatttgtcctttcacaattggtggcgatggttttctccttccatttatctttctag

        |4491      |4501      |4511      |4521      |4531      |4541
GTCATCCCCTTCTAAATGCCCATCATTAGATGATAGGTGGTACATGCACAGTTGCTCTGG
  S    S    P    S    K    C    P    S    L    D    D    R    W    Y    M    H    S    C    S    G
                    |1501                                        |1511
```

20

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      |4551      |4561      |4571      |4581      |4591      |4601
GAGTCTTCAGAATAGAAACTACCCATCTCAAGAGGAGCTCATTAAGGTTGTTGATGTGGA
  S  L  Q  N  R  N  Y  P  S  Q  E  E  L  I  K  V  V  D  V  E
                  |1521                              |1531

      |4611      |4621      |4631      |4641      |4651      |4661
GGAGCAACAGCTGGAAGAGTCTGGGCCACACGATTTGACGGAAACATCTTACTTGCCAAG
  E  Q  Q  L  E  E  S  G  P  H  D  L  T  E  T  S  Y  L  P  R
                  |1541                              |1551

      |4671      .    .    .    .    .    .    .    .    .
GCAAGATCTAGgtaatatttcatctgctgtattggaacaaacactttgattttactctga
  Q  D  L  E


   .    .    .    .    .    .    .    .    .    .    .    .
atcctacataaagatattctggttaaccaacttttagatgtactagtctatcatggacac


   .    .    .    .    .    .    .    .    .    .    .    .
ttttgttatacttaattaagcccactttagaaaaatagctcaagtgttaatcaaggttta


   .    .    .    .    .    .    .    .    .    .    .    .
cttgaaaattattgaaactgttaatccatctatattttaattaatggtttaactaatgat


   .    .    .    .    .    .    .    .    .    .    .    .
tttgaggatgagggagtcttggtgtactctaaatgtattatttcaggccaggcatagtgg


   .    .    .
ctcacgcctgt



Exon 15 | Start: 146745 | End: 147056 | Length: 311



   .    .    .    .    .    .    .    .    .    .    .    .
tctaaaattatactattcctatgactaaacctttgcatatatcttttatctccctaggat


   .    .    .    .    .    .    .    .    .    .    .    .
atatttctaaaactagcattgttgactgaaagtgtaaatacgtgttaaggtgtttgctac


   .    .    .    .    .    .    .    .    .    .    .    .
ataatgccatatttcctttttaggaaactaagctactttggatttccaccaacactgtat


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

```
tcatgtacccattttctcttaacctaactttattggtcttttaattcttaacagagac


      .       .       .       .       .       .       .       .       .       .       .
cagaactttgtaattcaacattcatcgttgtgtaaattaaacttctcccattcctttcag

      |4681     |4691     |4701     |4711     |4721     |4731
AGGGAACCCCTTACCTGGAATCTGGAATCAGCCTCTTCTCTGATGACCCTGAATCTGATC
   G  T  P  Y  L  E  S  G  I  S  L  F  S  D  D  P  E  S  D  P
      |1561                           |1571

      |4741     |4751     |4761     |4771     |4781     |4791
CTTCTGAAGACAGAGCCCCAGAGTCAGCTCGTGTTGGCAACATACCATCTTCAACCTCTG
   S  E  D  R  A  P  E  S  A  R  V  G  N  I  P  S  S  T  S  A
      |1581                           |1591

      |4801     |4811     |4821     |4831     |4841     |4851
CATTGAAAGTTCCCCAATTGAAAGTTGCAGAATCTGCCCAGAGTCCAGCTGCTGCTCATA
   L  K  V  P  Q  L  K  V  A  E  S  A  Q  S  P  A  A  A  H  T
      |1601                           |1611

      |4861     |4871     |4881     |4891     |4901     |4911
CTACTGATACTGCTGGGTATAATGCAATGGAAGAAAGTGTGAGCAGGGAGAAGCCAGAAT
   T  D  T  A  G  Y  N  A  M  E  E  S  V  S  R  E  K  P  E  L
      |1621                           |1631

      |4921     |4931     |4941     |4951     |4961     |4971
TGACAGCTTCAACAGAAAGGGTCAACAAAAGAATGTCCATGGTGGTGTCTGGCCTGACCC
   T  A  S  T  E  R  V  N  K  R  M  S  M  V  V  S  G  L  T  P
      |1641                           |1651

      |4981     .       .       .       .       .       .       .       .       .
CAGAAGAATTTgtgagtgtatccatatgtatctccctaatgactaagacttaacaacatt
   E  E  F
      |1661


      .       .       .       .       .       .       .       .       .       .       .
ctggaaagagttttatgtaggtattgtcaattaataacctagaggaagaaatctagaaaa

      .       .       .       .       .       .       .       .       .       .       .
caatcacagttctgtgtaatttaatttcgattactaatttctgaaaatttagatctagat

      .       .       .       .       .       .       .       .       .       .       .
aaagctatagtgtggattattttatgtatatttacttgagaaaataattattaaatatta

      .       .       .       .       .       .       .       .       .       .       .
gtggaaaagctatactttgggtatgatataggactttcgaattggaattttcctttctat
```

22

```
    .         .         .
ctgtaaaagca
```

Exon 16 | Start: 150288 | End: 150376 | Length: 88

```
    .         .         .         .         .         .         .         .         .         .         .         .
gagacttcaggtgtcttagaattttttaaatgtaccctttctgagaaaaacagagactta

    .         .         .         .         .         .         .         .         .         .         .         .
aagctaggataactggtattctattttttttttttttttttttttttacctccagcctgggt

    .         .         .         .         .         .         .         .         .         .         .         .
gacagagcaagactctgtctaaaaaaaaaaaaaaaaaaaattcactttaaatagttccagg

    .         .         .         .         .         .         .         .         .         .         .         .
acacgtgtagaacgtgcaggattgctacataggtaaacatatgccatggtggaataacta

    .         .         .         .         .         .         .         .         .         .         .         .
gtattctgagctgtgtgctagaggtaactcatgataatggaatatttgatttaatttcag

     |4991      |5001      |5011      |5021      |5031      |5041
ATGCTCGTGTACAAGTTTGCCAGAAAACACCACATCACTTTAACTAATCTAATTACTGAA
 M   L   V   Y   K   F   A   R   K   H   H   I   T   L   T   N   L   I   T   E
                               |1671                              |1681

     |5051      |5061      |5071      .         .         .         .         .         .
GAGACTACTCATGTTGTTATGAAAACAGgtataccaagaacctttacagaataccttgca
 E   T   T   H   V   V   M   K   T   D
                               |1691

    .         .         .         .         .         .         .         .         .         .         .         .
tctgctgcataaaaccacatgaggcgaggcacggtggcgcatgcctgtaatcgcagcact

    .         .         .         .         .         .         .         .         .         .         .         .
ttgggaggccgaggcgggcagatcacgagattaggagatcgagaccatcctggccagcat

    .         .         .         .         .         .         .         .         .         .         .         .
ggtgaaaccccgtctctactaaaaaataaaaaaattagctgggtgtggtcgcgtgcgcct

    .         .         .         .         .         .         .         .         .         .         .         .
gtagtcccagctactcgtgaggctgaggcaggagaatcacttgaaccggggagatggagg
```

```
      .         .         .         .         .         .
ttgcagtgagccgagatcatgccactgc
```


Exon 17 | Start: 154032 | End: 154110 | Length: 78


```
      .         .         .         .         .         .         .         .         .         .         .         .
tataatggagatctatagctagccttggcgtctagaagatgggtgttgagaagagggagt

      .         .         .         .         .         .         .         .         .         .         .         .
ggacagatatttcctctggtcttaacttcatatcagcctcccctagacttccaaatatcc

      .         .         .         .         .         .         .         .         .         .         .         .
atacctgctggttataattagtggtgttttcagcctctgattctgtcaccaggggttttta

      .         .         .         .         .         .         .         .         .         .         .         .
gaatcataaatccagattgatcttgggagtgtaaaaaactgaggctctttagcttcttag

      .         .         .         .         .         .         .         .         .         .         .         .
gacagcacttcctgattttgttttcaacttctaatcctttgagtgttttttcattctgcag
```

```
       |5081      |5091      |5101      |5111      |5121      |5131
ATGCTGAGTTTGTGTGTGAACGGACACTGAAATATTTTCTAGGAATTGCGGGAGGAAAAT
  A  E  F  V  C  E  R  T  L  K  Y  F  L  G  I  A  G  G  K  W
                               |1701                          |1711
```

```
       |5141      |5151 .         .         .         .         .         .         .
GGGTAGTTAGCTATTTCTgtaagtataatactatttctcccctcctccctttaacacctc
  V  V  S  Y  F  W
```


```
       .         .         .         .         .         .         .         .         .         .         .         .
agaattgcatttttacacctaacgtttaacacctaaggttttttgctgatgctgagtctga

       .         .         .         .         .         .         .         .         .         .         .         .
gttaccaaaaggtctttaattgtaatactaaactacttttatctttaatatcactttgtt

       .         .         .         .         .         .         .         .         .         .         .         .
cagataagctggtgatgctgggaaaatgggtctcttttataactaataggacctaatctg

       .         .         .         .         .         .         .         .         .         .         .         .
ctcctagcaatgttagcatatgagctagggatttatttaatagtcggcaggaatccatgt
```

```
     .      .      .      .
gcagcaggcaaacttata
```

Exon 18 | Start: 154610 | End: 154651 | Length: 41

```
   .      .      .      .      .      .      .      .      .      .      .      .
ataactaataggacctaatctgctcctagcaatgttagcatatgagctagggatttatttt

   .      .      .      .      .      .      .      .      .      .      .      .
aatagtcggcaggaatccatgtgcagcaggcaaacttataatgtttaaattaaacatcaa

   .      .      .      .      .      .      .      .      .      .      .      .
ctctgtctccagaaggaaactgctgctacaagccttattaaagggctgtggctttagagg

   .      .      .      .      .      .      .      .      .      .      .      .
gaaggacctctcctctgtcattcttcctgtgctcttttgtgaatcgctgacctctctatc

   .      .      .      .      .      .      .      .      .      .      .      .
tccgtgaaaagagcacgttcttctgctgtatgtaacctgtcttttctatgatctctttag

        |5161     |5171     |5181     |5191 .      .      .
GGGTGACCCAGTCTATTAAAGAAAGAAAAATGCTGAATGAGgtaagtacttgatgttaca
  V   T   Q   S   I   K   E   R   K   M   L   N   E
        |1721                         |1731

   .      .      .      .      .      .      .      .      .      .      .      .
aactaaccagagatattcattcagtcatatagttaaaaatgtatttgcttccttccatca

   .      .      .      .      .      .      .      .      .      .      .      .
atgcaccactttccttaacaatgcacaaattttccatgataatgaggatcatcaagaatt

   .      .      .      .      .      .      .      .      .      .      .      .
atgcaggcctgcactgtggctcatacctataatcccagcgctttgggaggctgaggcgct

   .      .      .      .      .      .      .      .      .      .      .      .
tggatcacctgatgtcgggagttcaagaccagcctgaccaacatggagaaaccccgtttc

   .      .      .      .      .      .      .      .      .      .      .      .
tactaaaaatacaaaattagccgggcttggtggcacttgcc
```

Exon 19 | Start: 160848 | End: 160932 | Length: 84


```
        .       .       .       .       .       .       .       .       .       .       .       .
gcattcaaaagattctcctgcctcagcctcccaagtagctgggattacaggtgcctgcca

        .       .       .       .       .       .       .       .       .       .       .       .
ccacgcccaactaattttttgtattttttagtagagatgaggtttcaccatgttggtcaga

        .       .       .       .       .       .       .       .       .       .       .       .
ctggtgtcgaactcctgacctcaagtgatctgcctgcctcagtctcccaaagtgctagga

        .       .       .       .       .       .       .       .       .       .       .       .
ttacaggggtgagccactgcgcctggcctgaatgccttaaatatgacgtgtctgctccac

        .       .       .       .       .       .       .       .       .       .       .       .
ttccattgaaggaagcttctctttctcttatcctgatgggttgtgtttggtttctttcag

         |5201     |5211     |5221     |5231     |5241     |5251
CATGATTTTGAAGTCAGAGGAGATGTGGTCAATGGAAGAAACCACCAAGGTCCAAAGCGA
 H   D   F   E   V   R   G   D   V   V   N   G   R   N   H   Q   G   P   K   R
                                   |1741                             |1751

          |5261     |5271     .       .       .       .       .       .       .
GCAAGAGAATCCCAGGACAGAAAGgtaaagctccctccctcaagttgacaaaaatctcac
 A   R   E   S   Q   D   R   K


         .       .       .       .       .       .       .       .       .       .       .       .
cccaccactctgtattccactcccctttgcagagatgggccgcttcattttgtaagactt

         .       .       .       .       .       .       .       .       .       .       .       .
attacatacatacacagtgctagatactttcacacaggttcttttttcactcttccatcc

         .       .       .       .       .       .       .       .       .       .       .       .
caaccacataaataagtattgtctctactttatgaatgataaaactaagagatttagaga

         .       .       .       .       .       .       .       .       .       .       .       .
ggctgtgtaatttggattcccgtctcgggttcagatcttagctgataagtggaagagctg

         .       .       .       .       .
ggactttaagcagatgagaatcta
```

Exon 20 | Start: 166866 | End: 166921 | Length: 55

```
       .         .         .         .         .         .         .

cttggcctgattggtgacaaaagtgagatgctcagtccttgaatgacaaagaatgcctgt

       .         .         .         .         .         .         .

agagtgcaggtcaactacatatgcacttcaagaagatcttctgaaatccagtagtgttct

       .         .         .         .         .         .         .

ggacattggactgcttgtccctgggaagtagcagcagaaatcatcaggtggtgaacagaa

       .         .         .         .         .         .         .

gaaaaagaaaagctcttcctttttgaaagtctgtttttttgaataaaagccaatattcttt

       .         .         .         .         .         .         .

tataactagattttccttctctccattcccctgtccctctctcttcctctcttcttccag

    |5281      |5291      |5301      |5311      |5321      |5331    .
ATCTTCAGGGGGCTAGAAATCTGTTGCTATGGGCCCTTCACCAACATGCCCACAGgtaag
 I   F   R   G   L   E   I   C   C   Y   G   P   F   T   N   M   P   T   D
    |1761                            |1771

       .         .         .         .         .         .         .

agcctgggagaaccccagagttccagcaccagcctttgtcttacatagtggagtattata

       .         .         .         .         .         .         .

agcaagatcccacgatgggggttcctcagattgctgaaatgttctagaggctattctatt

       .         .         .         .         .         .         .

tctctaccactctccaaacaaaacagcacctaaatgttatcctatggcaaaaaaaaacta

       .         .         .         .         .         .         .

taccttgtccccttctcaagagcatgaaggtggttaatagttaggattcagtatgttat

       .         .         .         .         .         .         .

gtgttcagatggcgttgagctgctgttagtgccaacatgttagtgagaaaatatc
```

Exon 21 | Start: 168789 | End: 168863 | Length: 74

```
          .         .         .         .         .         .
    attaatggaaattagatctttgatttttttttctttcaagcattttatttgagagactat

          .         .         .         .         .         .
    caaaccttataccaagtggccttatggagactgataaccagagtacatggcatatcagtg

          .         .         .         .         .         .
    gcaaattgacttaaaatccatacccctactattttaagaccattgtcctttggagcagag

          .         .         .         .         .         .
    agacagactctcccattgagaggtcttgctataagccttcatccggagagtgtagggtag

          .         .         .         .         .         .
    agggcctgggttaagtatgcagattactgcagtgattttacatctaaatgtccattttag

          |5341      |5351      |5361      |5371      |5381      |5391
    ATCAACTGGAATGGATGGTACAGCTGTGTGGTGCTTCTGTGGTGAAGGAGCTTTCATCAT
      Q   L   E   W   M   V   Q   L   C   G   A   S   V   V   K   E   L   S   S   F
          |1781                                  |1791

          |5401      .         .         .         .         .         .
    TCACCCTTGGCACAgtaagtattgggtgccctgtcagagagggaggacacaatattctct
      T   L   G   T
          |1801

          .         .         .         .         .         .
    cctgtgagcaagactggcacctgtcagtccctatggatgcccctactgtagcctcagaag

          .         .         .         .         .         .
    tcttctctgcccacatacctgtgccaaaagactccatctgtaagggatgggtaaggattt

          .         .         .         .         .         .
    gagaactgcacatattaaatatactgagggaagactttttccctctaactctttttccca

          .         .         .         .         .         .
    tatgtccctccccctcctctctgtgactgccccagcatactgtgtttcaacaaatcatca

          .         .         .
    agaaatgatgggct


Exon 22 | Start: 170280 | End: 170341 | Length: 61
```

```
     .         .         .         .         .         .         .         .         .         .
     ccaggagtttgagaccagcctgggcaacatggcaaaaccctgtctctaccaaaaatacaa

     .         .         .         .         .         .         .         .         .         .
     aaaaattagccaggggtggtggtacgtgtctgtagttccagctacttaggaggctgagat

     .         .         .         .         .         .         .         .         .         .
     ggaaggattgcttgagcccaggaggcagaggtggcagtgagctgagatcacaccactgca

     .         .         .         .         .         .         .         .         .         .
     ctccagcctgggtgacagagcaagaccctgtctcaaaaacaaacaaaaaaaatgatgaag

     .         .         .         .         .         .         .         .         .         .
     tgacagttccagtagtcctactttgacactttgaatgctctttccttcctggggatccag

         |5411      |5421      |5431      |5441      |5451      |5461
     GGTGTCCACCCAATTGTGGTTGTGCAGCCAGATGCCTGGACAGAGGACAATGGCTTCCAT
     G   V   H   P   I   V   V   V   Q   P   D   A   W   T   E   D   N   G   F   H
                                         |1811                                |1821

              .         .         .         .         .         .         .         .         .
     Ggtaaggtgcctgcatgtacctgtgctatatggggtccttttgcatgggtttggtttatc
     A


     .         .         .         .         .         .         .         .         .         .
     actcattacctggtgcttgagtagcacagttcttggcacattttaaatatttgttgaatg

     .         .         .         .         .         .         .         .         .         .
     aatggctaaaatgtcttttttgatgtttttattgttatttgtttttatattgtaaaagtaat

     .         .         .         .         .         .         .         .         .         .
     acatgaactgtttccatggggtggggagtaagatatgaatgttcatcacaaaaacataaat

     .         .         .         .         .         .         .         .         .         .
     caaggccgggcatggtggctcatgcctataattccagcactttgggaggtcaagatggag

     .
     g



     Exon 23 | Start: 172181 | End: 173689 | Length: 1508
```

```
        .         .         .         .         .         .         .         .         .         .         .         .
     taaaaatacaaaaattagctgggtgtgatggcatgtgcctgtaattccagctactcagga

        .         .         .         .         .         .         .         .         .         .         .         .
     ggcagagacaggagaattgcttgaacccaggaggcggaggttgaatgagccgagattgcg

        .         .         .         .         .         .         .         .         .         .         .         .
     ccatcacactctagcctcggcgacagagcaagactccgtctcaaaaaaaaaaaaaaaaaa

        .         .         .         .         .         .         .         .         .         .         .         .
     ttagcttctacctcattaatcctaagaactcatacaaccaggaccctggagtcgattgat

        .         .         .         .         .         .         .         .         .         .         .         .
     tagagcctagtccaggagaatgaattgacactaatctctgcttgtgttctctgtctccag

        |5471      |5481      |5491      |5501      |5511      |5521
     CAATTGGGCAGATGTGTGAGGCACCTGTGGTGACCCGAGAGTGGGTGTTGGACAGTGTAG
       I  G  Q  M  C  E  A  P  V  V  T  R  E  W  V  L  D  S  V  A
                          |1831                              |1841

        |5531      |5541      |5551      |5561      |5571      |5581
     CACTCTACCAGTGCCAGGAGCTGGACACCTACCTGATACCCCAGATCCCCCACAGCCACT
       L  Y  Q  C  Q  E  L  D  T  Y  L  I  P  Q  I  P  H  S  H  Y
                          |1851                              |1861

        |5591      |+11       |+21       |+31       |+41       |+51
     ACTGACTGCAGCCAGCCACAGGTACAGAGCCACAGGACCCCAAGAATGAGCTTACAAAGT
       *

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

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

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

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

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

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

```
GGCTTGGCCTCAAGAGAATAGCTGGTTTCCCTAAGTTTACTTCTCTAAAACCCTGTGTTC

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

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

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

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

       |+661      |+671      |+681      |+691      |+701      |+711
AAACCAGCCTGGCCAACATGGTGAAACCCCATCTCTACTAAAAATACAGAAATTAGCCGG

       |+721      |+731      |+741      |+751      |+761      |+771
TCATGGTGGTGGACACCTGTAATCCCAGCTACTCAGGTGGCTAAGGCAGGAGAATCACTT

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

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

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

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

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

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

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

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

       |+1261     |+1271     |+1281     |+1291     |+1301     |+1311
GTTGGAAGGACTAGGTCTTCCCTAGCCCCCCCAGTGTGCAAGGGCAGTGAAGACTTGATT
```

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

     |+1381  .       .       .       .       .       .       .       .       .       .
CACTTCCAccatgaatgactgttcttgagacttaggccagccgactttctcagagccttt


     .       .       .       .       .       .       .       .       .       .       .       .
tcactgtgcttcagtctcccactctgtaaaatgggggtaatgatagtatctacctcctag


     .       .       .       .       .       .       .       .       .       .       .       .
gatttattgaggcagcttaaataccttttgtatttcctgttgctgccaaaacaaattgtt


     .       .       .       .       .       .       .       .       .       .       .       .
gcaaggtcagaagtctgaggtggctcaactgtttctttgtttcaggtttcatgaggccaa


     .       .       .       .       .       .       .       .       .       .       .       .
aataaaggtgttcgcagggcgtgttcccttctagaggctctgggtccttgcagttctagg


     .       .
actaagat
```

GBK Parser: Version: 0.3, Version Date: 11/02/2015
Reader: Version: 0.3, Version Date: 11/02/2015
Writer: Version: 0.3, Version Date: 11/02/2015
Control: Version: 0.3, Version Date: 11/02/2015