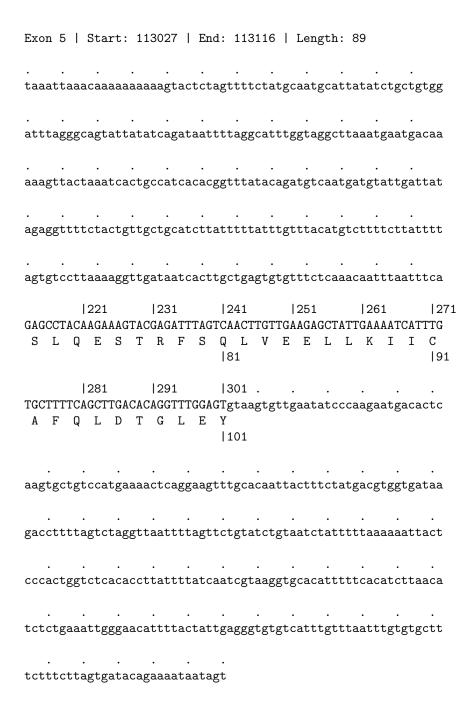Gene: BRCA1 - Sequence: NG_005905.2
Transcript: NM_007294.3 - Protein: NP_009225.1
Date : February 25, 2015

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

```
    .     .     .     .     .     .     .     .     .     .     .     .
ttacttatatttaccgaaactggagacctccattagggcggaaagagtgggggattggga

    .     .     .     .     .     .     .     .     .     .     .     .
cctcttcttacgactgctttggacaataggtagcgattctgaccttcgtacagcaattac

    .     .     .     .     .     .     .     .     .     .     .     .
tgtgatgcaataagccgcaactggaagagtagaggctagagggcaggcactttatggcaa

    .     .     .     .     .     .     .     .     .     .     .     .
actcaggtagaattcttcctcttccgtctctttccttttacgtcatccggggggcagactg

    .     .     .     .     .     .     .     .     .     .     .     .
ggtggccaatccagagccccgagagacgcttggctctttctgtccctcccatcctctgat

    |-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

        .     .     .     .     .     .     .     .     .     .     .
gggtattctttgacggggggtaggggcggaacctgagaggcgtaaggcgttgtgaaccct
```

1

```
      .         .         .         .         .         .         .
ggggagggggggcagtttgtaggtcgcgagggaagcgctgaggatcaggaaggggggcactg

      .         .         .         .         .         .         .
agtgtccgtgggggaatcctcgtgataggaactggaatatgccttgagggggacactatg

      .         .         .         .         .
tctttaaaaacgtcggctggtcatgaggtcagg
```

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

```
   .         .         .         .         .         .         .
aaggctaccaccacctacccggtcagtcactcctctgtagctttctctttcttggagaaa

      .         .         .         .         .         .         .
ggaaaagacccaaggggttggcagcaatatgtgaaaaaattcagaatttatgttgtctaa

      .         .         .         .         .         .         .
ttacaaaaagcaacttctagaatctttaaaaataaaggacgttgtcattagttctttggt

      .         .         .         .         .         .         .
ttgtattattctaaaaccttccaaatcttaaatttactttattttaaaatgataaaatga

      .         .         .         .         .         .         .
agttgtcattttataaaccttttaaaaagatatatatatatgttttttctaatgtgttaaa

|-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

      .         .         .         .         .         .         .
agggaagaaaagacatgtctagtaagattaggctattgtaattgctgattttcttaactg

      .         .         .         .         .         .         .
aagaactttaaaaatatagaaaatgattccttgttctccatccactctgcctctcccact
```

2

     .   .   .   .
cctctccttttcaacacaaatcctgtggtccgggaaagacagggactctgtcttgattgg

     .   .   .   .
ttctgcactggggcaggaatctagtttagattaactggc

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

   .   .   .   .
gaattcgtacgaactattatcaactaatcttttaaatgctgatgatagtatagagtattg

   .   .   .   .
aagggatcaatataattctgttttgatatctgaaagctcactgaaggtaaggatcgtatt

   .   .   .   .
ctctgctgtattctcagttcctgacacagcagacatttaataaatattgaacgaacttga

   .   .   .   .
ggccttatgttgactcagtcataacagctcaaagttgaacttattcactaagaatagctt

   .   .   .   .
tatttttaaataaattattgagcctcatttattttcttttttctcccccccctaccctgcta

|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

    .   .   .   .
gtaaagttttgacatatattatctttttttttttttttgagacaaagtctcgctctgtcg

    .   .   .   .
cccaggctggagtgcagtggcatgatcttggctcactgcaacctccgcccccccg

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

```
     .      .      .      .      .      .      .      .      .      .      .      .
ttatgaatatatcattaaatatgccatattaactttttattaagttttatgtgatcataac

     .      .      .      .      .      .      .      .      .      .      .      .
agtaagccatatgcatgtaagttcagtttttcatagatcattgcttatgtagtttaggtttt

     .      .      .      .      .      .      .      .      .      .      .      .
ttgcttatgcagcatccaaaaacaattaggaaactattgcttgtaattcacctgccatta

     .      .      .      .      .      .      .      .      .      .      .      .
ctttttaaatggctcttaagggcagttgtgagattatcttttcatggctatttgccttttt

     .      .      .      .      .      .      .      .      .      .      .      .
gagtattctttctacaaaaggaagtaaattaaattgttctttctttctttataatttata
        |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

     .      .      .      .      .      .      .      .      .      .      .      .
gtgtaaaaacttgcagacttatgtaaagtagggctgtatcgccgtgcccccattgtctgt

     .      .      .      .
taatcttgttttttatatt
```

4

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

```
       .       .       .       .       .       .       .       .       .       .       .
taaattaaacaaaaaaaaaagtactctagttttctatgcaatgcattatatctgctgtgg

       .       .       .       .       .       .       .       .       .       .       .
atttagggcagtattatatcagataattttaggcatttggtaggcttaaatgaatgacaa

       .       .       .       .       .       .       .       .       .       .       .
aaagttactaaatcactgccatcacacggtttatacagatgtcaatgatgtattgattat

       .       .       .       .       .       .       .       .       .       .       .
agaggttttctactgttgctgcatcttattttttatttgtttacatgtctttttcttatttt

       .       .       .       .       .       .       .       .       .       .       .
agtgtccttaaaaggttgataatcacttgctgagtgtgtttctcaaacaatttaatttca

          |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

       .       .       .       .       .       .       .       .       .       .       .
gaccttttagtctaggttaattttagttctgtatctgtaatctatttttaaaaaattact

       .       .       .       .       .       .       .       .       .       .       .
cccactggtctcacaccttattttatcaatcgtaaggtgcacatttttcacatcttaaca

       .       .       .       .       .       .       .       .       .       .       .
tctctgaaattggggaacattttactattgagggtgtgtcatttgtttaatttgtgtgctt

       .       .       .       .       .       .
tctttcttagtgatacagaaaataatagt
```

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

5

```
          .         .         .         .         .         .
      ttacattgttggtgtcttagctttagtgaaatacagtattgataggcaaatttcttagtg

          .         .         .         .         .         .
      ttaaggtagaaaacaaggactctaaataactttgatggtctgtgtatttgttttttgtttc

          .         .         .         .         .         .
      ctaggagtaaaatttccagttgattttttaaaatttgattttttaaaaaaaatcacaggta

          .         .         .         .         .         .
      accttaatgcattgtcttaacacaacaaagagcatacatagggtttctcttggtttctttt

          .         .         .         .         .         .
      gattataattcatacatttttctctaactgcaaacataatgttttcccttgtattttaca

              |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


          .         .         .         .         .         .         .
      cttttttttttcttttttttttttttgagatggagtcttgctctgtggcccaggctagaagc

          .         .         .         .         .         .         .
      agtcctcctgccttagccccccttagtagctgggattacaggcacgcgccaccatgccagg

          .         .         .         .         .         .         .
      ctaattttttgtattttttagtagagacggggtttcatcatgttggccaggctggtctcgaa

          .         .         .         .         .         .         .
      ctcctaacctcaggtgatccacccacctcggctccccaaattgctgggattacaggtgtg

          .         .         .
      agccactgtgcccggccggt
```

6

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

```
     .    .    .    .    .    .    .    .    .    .    .    .
tactactactattattttgtagagactgggtctcactctgttgcttatgctggtcttgaa

     .    .    .    .    .    .    .    .    .    .    .    .
ctcctggcctcaagcagtcctgctccagcctcccaaagtgctgggattataggcatgagc

     .    .    .    .    .    .    .    .    .    .    .    .
taccgctcccagccccagacattttagtgtgtaaattcctgggcattttttccaggcatc

     .    .    .    .    .    .    .    .    .    .    .    .
atacatgttagctgactgatgatggtcaatttattttgtccatggtgtcaagtttctctt

     .    .    .    .    .    .    .    .    .    .    .    .
caggaggaaaagcacagaactggccaacaattgcttgactgttctttaccatactgttta
```

```
        |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
```

```
     .    .    .    .    .    .    .    .    .    .    .    .
tttttttaagtatttaataataattgctggattccttatcttatagttttgccaaaaatct

     .    .    .    .    .    .    .    .    .    .    .    .
tggtcataatttgtatttgtggtaggcagctttgggaagtgaattttatgagccctatgg

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

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

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


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

```
        .        .        .        .        .        .        .        .        .        .        .        .
gtagaaacggggggtctcactttgttggccaggctggtcttgaactcctaacctcaaataa

        .        .        .        .        .        .        .        .        .        .        .        .
tccacccatctcggcctcctcaagtgctgggattacaggtgagagccactgtgcctggcg

        .        .        .        .        .        .        .        .        .        .        .        .
aagcccatgcctttaaccacttctctgtattacatactagcttaactagcattgtacctg

        .        .        .        .        .        .        .        .        .        .        .        .
ccacagtagatgctcagtaaatatttctagttgaatatctgttttttcaacaagtacattt

        .        .        .        .        .        .        .        .        .        .        .        .
ttttaacccttttaattaagaaaacttttattgatttattttttggggggaaattttttta

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

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

        .        .        .        .        .        .        .        .        .        .        .        .
tctttttaaaaatattttaacttttattttaggttcagggatgtatgtgcagtttgttat

        .        .        .        .        .        .        .        .        .        .        .        .
ataggtaaacacacgacttgggatttggtgtatagattttttttcatcatccgggtactaa

        .        .        .        .        .        .        .        .        .        .        .        .
gcataccccacagttttttgtttgctttctttctgaatttctccctcttcccaccttcct

        .        .        .        .        .        .        .        .        .
ccctcaagtaggctggtgtttctccagactagaatcatggtattgg


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

        .        .        .        .        .        .        .        .        .        .        .        .
tgtattttttagtagagatggggtttcaccatgttggccaggctggtcttgaactcatgac

        .        .        .        .        .        .        .        .        .        .        .        .
ctcaagtggtccacccgcctcagcctcccaaagtgctggaattacaggcttgagccaccg
```

```
          .         .         .         .         .         .
        tgcccagcaaccatttcatttcaactagaagtttctaaaggagagagcagctttcactaa

          .         .         .         .         .         .
        ctaaataagattggtcagctttctgtaatcgaaagagctaaaatgtttgatcttggtcat

          .         .         .         .         .         .
        ttgacagttctgcatacatgtaactagtgtttcttattaggactctgtcttttccctata

             |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

          .         .         .         .         .         .
        ccctttcgtttttttttttgtttgtttgtttgtttttttttgagatggggtctcactctg

          .         .         .         .
        ttgcccaggctggagtg



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

          .         .         .         .         .         .
        cagttttctgatggccaatctgcttttaattcactcttagacgttagagaaataggtgtg

          .         .         .         .         .         .
        gtttctgcatagggaaaattctgaaattaaaaatttaatggatcctaagtggaaataatc

          .         .         .         .         .         .
        taggtaaataggaattaaatgaaagagtatgagctacatcttcagtatacttggtagttt
```

9

```
           .         .         .         .         .         .         .         .         .         .         .         .
           atgaggttagtttctctaatatagccagttggttgatttccacctccaaggtgtatgaag

           .         .         .         .         .         .         .         .         .         .         .         .
           tatgtattttttttaatgacaattcagtttttgagtaccttgttattttttgtatattttca

           |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

           |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
           GTAAGGAAACATGTAATGATAGGCGGACTCCCAGCACAGAAAAAAAAGGTAGATCTGAATG
             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
```

10

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|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

|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
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|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
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
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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
  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  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
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     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
TTCCCATCAAGTCATTTGTTAAAACTAAATGTAAGAAAAATCTGCTAGAGGAAAACTTTG
   P   I   K   S   F   V   K   T   K   C   K   K   N   L   L   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   N   I
                         |1031                            |1041


|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
```

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|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

|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

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|3911      |3921      |3931      |3941      |3951      |3961
AAGACTTGACTGCAAATACAAACACCCAGGATCCTTTCTTGATTGGTTCTTCCAAACAAA
  D   L   T   A   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      .         .         .         .         .         .
ACTTAGgtattggaaccaggttttttgtgtttgccccagtctatttatagaagtgagctaa
  L   G


          .         .         .         .         .         .
atgtttatgcttttggggagcacattttacaaatttccaagtatagttaaaggaactgct


          .         .         .         .         .         .
tcttaaacttgaaacatgttcctcctaaggtgcttttcatagaaaaaagtccttcacaca


          .         .         .         .         .         .
gctaggacgtcatctttgactgaatgagctttaacatcctaattactggtggacttactt


          .         .         .         .         .         .
ctggtttcattttataaaagcaaatccaggtgtcccaaagcaaggaatttaatcattttg

.         .
tgtgac



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

          .         .         .         .         .         .
taaaggaactgcttcttaaacttgaaacatgttcctcctaaggtgcttttcatagaaaaa


          .         .         .         .         .         .
agtccttcacacagctaggacgtcatctttgactgaatgagctttaacatcctaattact
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      .     .     .     .     .     .     .     .     .     .     .     .
ggtggacttacttctggtttcattttataaaagcaaatccaggtgtcccaaagcaaggaa

      .     .     .     .     .     .     .     .     .     .     .     .
tttaatcattttgtgtgacatgaaagtaaatccagtcctgccaatgagaagaaaaagaca

      .     .     .     .     .     .     .     .     .     .     .     .
cagcaagttgcagcgtttatagtctgcttttacatctgaacctctgttttttgttatttaa

    |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

      .     .     .     .     .     .     .     .     .     .     .     .
agcaccttgatggaactcatactacctttttatttcacacacacgcacacgcgcacacaca

      .     .     .     .     .     .     .     .     .     .     .     .
gcctacacatacactgcctagctcattgtagcatactaaatactgattttaatgaataag

      .     .     .     .     .     .
ctaaaccttcgaaacccatttgctaatcc


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

      .     .     .     .     .     .     .     .     .     .     .     .
ttattttttcactccctagctttaaaagaaaataaccaacttcaaaaggacatcacaata

      .     .     .     .     .     .     .     .     .     .     .     .
acatcaagtctatttgggggaatttgaggattttttccctcactaacatcatttggaaat

      .     .     .     .     .     .     .     .     .     .     .     .
aatttcatgggcattaattgcatgaatgtggttagattaaaaggtgttcagctagaactt
```

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         .         .         .         .         .         .
         gtagttccatactaggtgatttcaattcctgtgctaaaattaatttgtatgatatatttt

         .         .         .         .         .         .
         catttaatggaaagcttctcaaagtatttcattttcttggtgccatttatcgtttttgaa

              |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      .
         TCTTCTGCCCTTGAGGACCTGCGAAATCCAGAACAAAGCACATCAGAAAAAGgtgtgtat
         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

         .         .         .         .         .         .
         ttcagggccaaggaatatagatttttttttttcagccttgtctcagctgggtgtctttatt

         .         .         .         .         .         .
         tactctgtcttaaagtgttccttttattatcattattattttttaatcattgaattccat
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```
            .         .         .         .         .         .         .         .         .         .         .         .
        ttggtgctagcatctgtctgttgcattgcttgtgtttataaaattctgcctgatatactt

            .         .         .         .         .         .         .         .         .         .         .         .
        gtttaaaaaccaatttgtgtatcatagattgatgcttttgaaaaaaatcagtattctaac

            .         .         .         .         .         .         .         .         .         .         .         .
        ctgaattatcactatcagaacaaagcagtaaagtagatttgtttttctcattccatttaaa

           |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

            .         .         .         .         .         .         .         .         .         .         .         .
        gaactctgattgttaatttttttcaccatactttctccagtttttttgcatacaggcattt

            .         .         .         .         .         .         .         .         .         .         .         .
        atacacttttattgctctaggatacttcttttgtttaatcctatataggttttttttgaacc

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

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

            .         .
        tcaaggc


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

            .         .         .         .         .         .         .         .         .         .         .         .
        cagcctcccgagtagctgagattacaggcgccagccaccacacccagctactgacctgct
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```
                 .         .         .         .         .         .         .         .         .         .
         tttaaacagctgggagatatggtgcctcagaccaacccaaccccatgttatatgtcaacc

                 .         .         .         .         .         .         .         .         .         .
         ctgacatattggcaggcaacatgaatccagacttctaggctgtcttgcgggctcttttttt

                 .         .         .         .         .         .         .         .         .         .
         gccagtcatttctgatctctctgacatgagctgtttcatttatgctttggctgcccagca

                 .         .         .         .         .         .         .         .         .         .
         agtatgatttgtcctttcacaattggtggcgatggtttttctccttccatttatctttcta

                 |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

                 |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

                 .         .         .
```

20

```
ctcacgcctgt
```

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

```
   .    .    .    .    .    .    .    .    .    .    .    .
ttctaaaattatactattcctatgactaaacctttgcatatatcttttatctccctagga

   .    .    .    .    .    .    .    .    .    .    .    .
tatatttctaaaactagcattgttgactgaaagtgtaaatacgtgttaaggtgtttgcta

   .    .    .    .    .    .    .    .    .    .    .    .
cataatgccatatttcctttttaggaaactaagctactttggatttccaccaacactgta

   .    .    .    .    .    .    .    .    .    .    .    .
ttcatgtacccatttttctcttaacctaactttattggtctttttaattcttaacagaga

   .    .    .    .    .    .    .    .    .    .    .    .
ccagaactttgtaattcaacattcatcgttgtgtaaattaaacttctcccattcctttca

        |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

     .      .      .
ctgtaaaagca



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

     .      .      .      .      .      .      .      .      .      .      .
cgagacttcaggtgtcttagaattttttaaatgtaccctttctgagaaaaacagagactt

     .      .      .      .      .      .      .      .      .      .      .
aaagctaggataactggtattctattttttttttttttttttttttacctccagcctggg

     .      .      .      .      .      .      .      .      .      .      .
tgacagagcaagactctgtctaaaaaaaaaaaaaaaaaaaaattcactttaaatagttccag

     .      .      .      .      .      .      .      .      .      .      .
gacacgtgtagaacgtgcaggattgctacataggtaaacatatgccatggtggaataact

     .      .      .      .      .      .      .      .      .      .      .
agtattctgagctgtgtgctagaggtaactcatgataatggaatatttgatttaatttca

     |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
```

22

```
E  T  T  H  V  V  M  K  T  D
                  |1691


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


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


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


   .     .     .     .     .     .     .     .     .     .     .     .
gtagtcccagctactcgtgaggctgaggcaggagaatcacttgaaccggggagatggagg


   .     .     .     .     .     .
ttgcagtgagccgagatcatgccactgc



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

   .     .     .     .     .     .     .     .     .     .     .     .
ctataatggagatctatagctagccttggcgtctagaagatgggtgttgagaagagggag


   .     .     .     .     .     .     .     .     .     .     .     .
tggacagatatttcctctggtcttaacttcatatcagcctcccctagacttccaaatatc


   .     .     .     .     .     .     .     .     .     .     .     .
catacctgctggttataattagtggtgttttcagcctctgattctgtcaccaggggtttt


   .     .     .     .     .     .     .     .     .     .     .     .
agaatcataaatccagattgatcttgggagtgtaaaaaactgaggctctttagcttctta


   .     .     .     .     .     .     .     .     .     .     .     .
ggacagcacttcctgattttgttttcaacttctaatcctttgagtgttttttcattctgca
        |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


                                 23
```

```
         .        .        .        .        .        .        .        .        .        .        .        .
agaattgcatttttacacctaacgtttaacacctaaggtttttgctgatgctgagtctga

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

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

         .        .        .        .        .        .        .        .        .        .        .        .
ctcctagcaatgttagcatatgagctagggatttatttaatagtcggcaggaatccatgt

         .        .        .        .        .
gcagcaggcaaacttata
```

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

```
         .        .        .        .        .        .        .        .        .        .        .        .
tataactaataggacctaatctgctcctagcaatgttagcatatgagctagggatttatt

         .        .        .        .        .        .        .        .        .        .        .        .
taatagtcggcaggaatccatgtgcagcaggcaaacttataatgtttaaattaaacatca

         .        .        .        .        .        .        .        .        .        .        .        .
actctgtctccagaaggaaactgctgctacaagccttattaaagggctgtggctttagag

         .        .        .        .        .        .        .        .        .        .        .        .
ggaaggacctctcctctgtcattcttcctgtgctcttttgtgaatcgctgacctctctat

         .        .        .        .        .        .        .        .        .        .        .        .
ctccgtgaaaagagcacgttcttctgctgtatgtaacctgtcttttctatgatctcttta

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

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

         .        .        .        .        .        .        .        .        .        .        .        .
atgcaccactttccttaacaatgcacaaattttccatgataatgaggatcatcaagaatt
```

24

```
     .         .         .         .         .         .
atgcaggcctgcactgtggctcatacctataatcccagcgctttgggaggctgaggcgct

     .         .         .         .         .         .
tggatcacctgatgtcgggagttcaagaccagcctgaccaacatggagaaaccccgtttc

     .         .         .         .         .
tactaaaaatacaaaattagccgggcttggtggcacttgcc
```

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

```
     .         .         .         .         .         .
tgcattcaaaagattctcctgcctcagcctcccaagtagctgggattacaggtgcctgcc

     .         .         .         .         .         .
accacgcccaactaattttttgtattttttagtagagatgaggtttcaccatgttggtcag

     .         .         .         .         .         .
actggtgtcgaactcctgacctcaagtgatctgcctgcctcagtctcccaaagtgctagg

     .         .         .         .         .         .
attacaggggtgagccactgcgcctggcctgaatgccttaaatatgacgtgtctgctcca

     .         .         .         .         .         .
cttccattgaaggaagcttctctttctcttatcctgatgggttgtgtttggtttctttca
        |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

     .         .         .         .         .         .         .
attacatacatacacagtgctagatactttcacacaggttctttttttcactcttccatcc

     .         .         .         .         .         .         .
caaccacataaataagtattgtctctactttatgaatgataaaactaagagatttagaga
```

25

```
     .       .       .       .       .       .       .       .       .       .       .       .
   ggctgtgtaatttggattcccgtctcgggttcagatcttagctgataagtggaagagctg

     .       .       .       .       .
   ggactttaagcagatgagaatcta


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

   .       .       .       .       .       .       .       .       .       .       .       .       .
   ccttggcctgattggtgacaaaagtgagatgctcagtccttgaatgacaaagaatgcctg

   .       .       .       .       .       .       .       .       .       .       .       .       .
   tagagtgcaggtcaactacatatgcacttcaagaagatcttctgaaatccagtagtgttc

   .       .       .       .       .       .       .       .       .       .       .       .       .
   tggacattggactgcttgtccctgggaagtagcagcagaaatcatcaggtggtgaacaga

   .       .       .       .       .       .       .       .       .       .       .       .       .
   agaaaaagaaaagctcttcctttttgaaagtctgtttttttgaataaaagccaatattctt

   .       .       .       .       .       .       .       .       .       .       .       .       .
   ttataactagattttccttctctccattcccctgtccctctctcttcctctcttcttcca

      |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

     .       .       .       .       .       .       .       .       .       .       .       .
   taccttgtcccccttctcaagagcatgaaggtggttaatagttaggattcagtatgttat

     .       .       .       .       .       .       .       .       .       .       .       .
   gtgttcagatggcgttgagctgctgttagtgccaacatgttagtgagaaaatatc
```

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

```
      .         .         .         .         .         .         .
aattaatggaaattagatctttgattttttttttctttcaagcattttatttgagagacta

      .         .         .         .         .         .         .
tcaaaccttataccaagtggccttatggagactgataaccagagtacatggcatatcagt

      .         .         .         .         .         .         .
ggcaaattgacttaaaatccatacccctactattttaagaccattgtcctttggagcaga

      .         .         .         .         .         .         .
gagacagactctcccattgagaggtcttgctataagccttcatccggagagtgtagggta

      .         .         .         .         .         .         .
gagggcctgggttaagtatgcagattactgcagtgattttacatctaaatgtccatttta
          |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
```

27

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

```
  .     .     .     .     .     .     .     .     .     .     .     .
cccaggagtttgagaccagcctgggcaacatggcaaaaccctgtctctaccaaaaataca

  .     .     .     .     .     .     .     .     .     .     .     .
aaaaaattagccaggggtggtggtacgtgtctgtagttccagctacttaggaggctgaga

  .     .     .     .     .     .     .     .     .     .     .     .
tggaaggattgcttgagcccaggaggcagaggtggcagtgagctgagatcacaccactgc

  .     .     .     .     .     .     .     .     .     .     .     .
actccagcctgggtgacagagcaagaccctgtctcaaaaacaaacaaaaaaaatgatgaa

  .     .     .     .     .     .     .     .     .     .     .     .
gtgacagttccagtagtcctactttgacactttgaatgctctttccttcctggggatcca

     |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

  .     .     .     .     .     .     .     .     .     .     .     .
aatggctaaaatgtcttttgatgtttttattgttatttgtttttatattgtaaaagtaat

  .     .     .     .     .     .     .     .     .     .     .     .
acatgaactgtttccatggggtgggagtaagatatgaatgttcatcacaaaaacataaat

  .     .     .     .     .     .     .     .     .     .     .     .
caaggccgggcatggtggctcatgcctataattccagcactttgggaggtcaagatggag
  .
g
```

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

28

```
    .         .         .         .         .         .         .
ctaaaaatacaaaaattagctgggtgtgatggcatgtgcctgtaattccagctactcagg

    .         .         .         .         .         .         .
aggcagagacaggagaattgcttgaacccaggaggcggaggttgaatgagccgagattgc

    .         .         .         .         .         .         .
gccatcacactctagcctcggcgacagagcaagactccgtctcaaaaaaaaaaaaaaaaa

    .         .         .         .         .         .         .
attagcttctacctcattaatcctaagaactcatacaaccaggaccctggagtcgattga

    .         .         .         .         .         .         .
ttagagcctagtccaggagaatgaattgacactaatctctgcttgtgttctctgtctcca

    |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
```

```
      |*1321      |*1331      |*1341      |*1351      |*1361      |*1371
GTACAAAATACGTTTTGTAAATGTTGTGCTGTTAACACTGCAAATAAACTTGGTAGCAAA

      |*1381 .         .         .         .         .         .         .         .         .         .
CACTTCCAccatgaatgactgttcttgagacttaggccagccgactttctcagagcctttt


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


      .         .         .         .         .         .         .         .         .         .         .
gatttattgaggcagcttaaatacctttttgtatttcctgttgctgccaaaacaaattgtt


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


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


      .         .
actaagat


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