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: 92501 | End: 92713 | Length: 212

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     .     .     .     .     .     .     .     .     .     .     .     .
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
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1

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      .         .         .         .         .         .         .
ggggagggggggcagtttgtaggtcgcgagggaagcgctgaggatcaggaaggggggcactg

      .         .         .         .         .         .         .
agtgtccgtgggggaatcctcgtgataggaactggaatatgccttgagggggacactatg

      .         .         .         .         .
tctttaaaaacgtcggctggtcatgaggtcagg


Exon 2 | Start: 93869 | End: 93967 | Length: 98

  .         .         .         .         .         .         .
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

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        .         .         .         .         .         .         .
cctctccttttcaacacaaatcctgtggtccgggaaagacagggactctgtcttgattgg

        .         .         .         .         .         .
ttctgcactggggcaggaatctagtttagattaactggc


Exon 3 | Start: 102205 | End: 102258 | Length: 53

    .         .         .         .         .         .         .         .
gaattcgtacgaactattatcaactaatcttttaaatgctgatgatagtatagagtattg

    .         .         .         .         .         .         .         .
aagggatcaatataattctgttttgatatctgaaagctcactgaaggtaaggatcgtatt

    .         .         .         .         .         .         .         .
ctctgctgtattctcagttcctgacacagcagacatttaataaatattgaacgaacttga

    .         .         .         .         .         .         .         .
ggccttatgttgactcagtcataacagctcaaagttgaacttattcactaagaatagctt

    .         .         .         .         .         .         .         .
tatttttaaataaattattgagcctcatttattttctttttctcccccccctaccctgcta

|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

    .         .         .         .         .         .         .         .
cccaggctggagtgcagtggcatgatcttggctcactgcaacctccgccccccg
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3

Exon 4 | Start: 111451 | End: 111528 | Length: 77

```
        .       .       .       .       .       .       .       .       .       .       .       .
ttatgaatatatcattaaatatgccatattaactttattaagttttatgtgatcataac

        .       .       .       .       .       .       .       .       .       .       .       .
agtaagccatatgcatgtaagttcagttttcatagatcattgcttatgtagtttaggtttt

        .       .       .       .       .       .       .       .       .       .       .       .
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
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Exon 5 | Start: 113028 | End: 113116 | Length: 88

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

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

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

   .     .     .     .     .     .     .     .     .     .     .     .
agaggttttctactgttgctgcatcttatttttatttgtttacatgtctttctattttt

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

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      .     .     .     .     .     .     .     .     .     .     .     .
aagtgctgtccatgaaaactcaggaagtttgcacaattactttctatgacgtggtgataa

      .     .     .     .     .     .     .     .     .     .     .     .
gacctttagtctaggttaattttagttctgtatctgtaatctattttaaaaaattact

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

      .     .     .     .     .     .     .     .     .     .     .     .
tctctgaaattgggaacattttactattgagggtgtgtcatttgtttaatttgtgtgctt

      .     .     .     .     .     .
tctttcttagtgatacagaaaataatagt
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Exon 6 | Start: 113723 | End: 113862 | Length: 139

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


           .         .         .         .         .         .
     cttttttttttctttttttttttttgagatggagtcttgctctgtggcccaggctagaagc

           .         .         .         .         .         .
     agtcctcctgccttagccccccttagtagctgggattacaggcacgcgccaccatgccagg

           .         .         .         .         .         .
     ctaattttttgtattttttagtagagacggggtttcatcatgttggccaggctggtctcgaa

           .         .         .         .         .         .
     ctcctaacctcaggtgatccacccacctcggctccccaaattgctgggattacaggtgtg

           .         .         .
     agccactgtgcccggccggt
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6

Exon 7 | Start: 118104 | End: 118209 | Length: 105

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

   .      .      .      .      .      .      .      .      .      .      .      .
tttttaagtatttaataataattgctggattccttatcttatagttttgccaaaaatct

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

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

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

   .      .      .      .      .      .      .      .      .      .      .      .
agtgggtggatcacctgaggtcgggagttcgagaccagcctagcca
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Exon 8 | Start: 120695 | End: 120740 | Length: 45

7

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      .        .        .        .        .        .        .        .        .        .        .        .
    gtagaaacgggggtctcactttgttggccaggctggtcttgaactcctaacctcaaataa

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

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

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

      .        .        .        .        .        .        .        .        .        .        .        .
    ttttaacccttttaattaagaaaacttttattgatttattttttgggggaaatttttta

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

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

      .        .        .        .        .        .        .        .        .        .        .        .
    tctttttaaaaatattttaacttttatttttaggttcagggatgtatgtgcagtttgttat

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

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

      .        .        .        .        .        .        .        .        .
    ccctcaagtaggctggtgtttctccagactagaatcatggtattgg


    Exon 9 | Start: 122062 | End: 122138 | Length: 76

      .        .        .        .        .        .        .        .        .        .        .        .
    tgtatttttagtagagatggggtttcaccatgttggccaggctggtcttgaactcatgac

      .        .        .        .        .        .        .        .        .        .        .        .
    ctcaagtggtccacccgcctcagcctcccaaagtgctggaattacaggcttgagccaccg
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8

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            .         .         .         .         .         .
      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: 123124 | End: 126549 | Length: 3425

            .         .         .         .         .         .
      cagttttctgatggccaatctgcttttaattcactcttagacgttagagaaataggtgtg

            .         .         .         .         .         .
      gtttctgcatagggaaaattctgaaattaaaaatttaatggatcctaagtggaaataatc

            .         .         .         .         .         .
      taggtaaataggaattaaatgaaagagtatgagctacatcttcagtatacttggtagttt
```

9

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          .         .         .         .         .         .         .         .         .         .         .         .
          atgaggttagtttctctaatatagccagttggttgatttccacctccaaggtgtatgaag

          .         .         .         .         .         .         .         .         .         .         .         .
          tatgtattttttaatgacaattcagtttttgagtaccttgttattttttgtatattttca

          |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
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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


                                    14
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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



   .    .    .    .    .    .    .    .    .    .    .    .
atgtttatgctttttggggagcacatttttacaaatttccaagtatagttaaaggaactgct


   .    .    .    .    .    .    .    .    .    .    .    .
tcttaaacttgaaacatgttcctcctaaggtgcttttcatagaaaaaagtccttcacaca


   .    .    .    .    .    .    .    .    .    .    .    .
gctaggacgtcatctttgactgaatgagctttaacatcctaattactggtggacttactt


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

   .    .
tgtgac



Exon 11 | Start: 126952 | End: 127040 | Length: 88

   .    .    .    .    .    .    .    .    .    .    .    .
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: 135409 | End: 135580 | Length: 171

        .       .       .       .       .       .       .       .       .       .       .       .
    ttatttttcactccctagctttaaaagaaaataaccaacttcaaaaggacatcacaata

        .       .       .       .       .       .       .       .       .       .       .       .
    acatcaagtctatttggggaatttgaggattttttccctcactaacatcatttggaaat

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

```
       .        .        .        .        .        .        .        .        .        .        .        .
       gtagttccatactaggtgatttcaattcctgtgctaaaattaatttgtatgatatatttt

       .        .        .        .        .        .        .        .        .        .        .        .
       catttaatggaaagcttctcaaagtatttcattttcttggtgccatttatcgttttttgaa

            |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: 141370 | End: 141496 | Length: 126

       .        .        .        .        .        .        .        .        .        .        .        .
       ttcagggccaaggaatatagattttttttttcagccttgtctcagctgggtgtctttatt

       .        .        .        .        .        .        .        .        .        .        .        .
       tactctgtcttaaagtgttccttttattatcattattattttttaatcattgaattccat
```

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```
        .         .         .         .         .         .
ttggtgctagcatctgtctgttgcattgcttgtgtttataaaattctgcctgatatactt

        .         .         .         .         .         .
gtttaaaaaccaatttgtgtatcatagattgatgcttttgaaaaaaatcagtattctaac

        .         .         .         .         .         .
ctgaattatcactatcagaacaaagcagtaaagtagatttgttttctcattccatttaaa

    |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

        .         .         .         .         .         .
atacacttttattgctctaggatacttctttttgtttaatcctatataggttttttgaacc

        .         .         .         .         .         .
tataacataagctacaacatgagaaatgtgcggttagatagatatgtcccttctgaaggt

        .         .         .         .         .         .
cagaaaaaaatataatggaggtaaaacctgaacaagcttggaaactgatggtagacttct

    .         .
tcaaggc
```

Exon 14 | Start: 143463 | End: 143653 | Length: 190

```
        .         .         .         .         .         .
cagcctcccgagtagctgagattacaggcgccagccaccacacccagctactgacctgct
```

```
          .         .         .         .         .         .         .         .         .         .
          tttaaacagctgggagatatggtgcctcagaccaacccaaccccatgttatatgtcaacc

          .         .         .         .         .         .         .         .         .         .
          ctgacatattggcaggcaacatgaatccagacttctaggctgtcttgcgggctctttttt

          .         .         .         .         .         .         .         .         .         .
          gccagtcatttctgatctctctgacatgagctgtttcatttatgctttggctgcccagca

          .         .         .         .         .         .         .         .         .         .
          agtatgatttgtcctttcacaattggtggcgatggttttctccttccatttatctttcta

              |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: 146746 | End: 147056 | Length: 310

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

21

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


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

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

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

    .       .       .       .       .       .       .       .       .       .       .       .
gtggaaaagctactttgggtatgatataggactttcgaattggaattttcctttctat

    .       .       .
ctgtaaaagca



Exon 16 | Start: 150289 | End: 150376 | Length: 87

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

    .       .       .       .       .       .       .       .       .       .       .       .
aaagctaggataactggtattctatttttttttttttttttttttttttacctccagcctggg

    .       .       .       .       .       .       .       .       .       .       .       .
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: 154033 | End: 154110 | Length: 77


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


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


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


   .     .     .     .     .     .     .     .     .     .     .     .
agaatcataaatccagattgatcttgggagtgtaaaaaactgaggctcttttagcttctta


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

```
         .         .         .         .         .         .         .         .         .         .         .         .
agaattgcattttttacacctaacgtttaacacctaaggtttttgctgatgctgagtctga

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

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

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

         .         .         .         .         .
gcagcaggcaaacttata
```

Exon 18 | Start: 154611 | End: 154651 | Length: 40

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

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

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

         .         .         .         .         .         .         .         .         .         .         .         .
ggaaggacctctcctctgtcattcttcctgtgctctttttgtgaatcgctgacctctctat

         .         .         .         .         .         .         .         .         .         .         .         .
ctccgtgaaaagagcacgttcttctgctgtatgtaacctgtctttttctatgatctcttta

        |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: 160849 | End: 160932 | Length: 83

```
    .         .         .         .         .         .
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: 166867 | End: 166921 | Length: 54

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

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

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

          .         .         .         .         .         .         .         .         .         .         .         .
     agaaaaagaaaagctcttccttttttgaaagtctgtttttttgaataaaagccaatattctt

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

          .         .         .         .         .         .         .         .         .         .         .         .
     agcaagatcccacgatggggggttcctcagattgctgaaatgttctagaggctattctatt

          .         .         .         .         .         .         .         .         .         .         .         .
     tctctaccactctccaaacaaaacagcacctaaatgttatcctatggcaaaaaaaaacta

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

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

Exon 21 | Start: 168790 | End: 168863 | Length: 73

```
      .         .         .         .         .         .         .
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

      .         .         .         .         .         .         .
gagaactgcacatattaaatatactgagggaagactttttccctctaactcttttttccca

      .         .         .         .         .         .         .
tatgtccctccccctcctctctgtgactgccccagcatactgtgtttcaacaaatcatca

      .         .         .
agaaatgatgggct
```

Exon 22 | Start: 170281 | End: 170341 | Length: 60

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

   .      .      .      .      .      .      .      .      .      .      .      .
aaaaaattagccagggggtggtggtacgtgtctgtagttccagctacttaggaggctgaga

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

   .      .      .      .      .      .      .      .      .      .      .      .
aatggctaaaatgtcttttttgatgtttttattgttatttgtttttatattgtaaaagtaat

   .      .      .      .      .      .      .      .      .      .      .      .
acatgaactgtttccatggggtggagtaagatatgaatgttcatcacaaaaacataaat

   .      .      .      .      .      .      .      .      .      .      .      .
caaggccgggcatggtggctcatgcctataattccagcactttgggaggtcaagatggag

   .
g
```

Exon 23 | Start: 172182 | End: 173689 | Length: 1507

```
         .         .         .         .         .         .
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 .       .       .       .       .       .       .       .       .       .
CACTTCCAccatgaatgactgttcttgagacttaggccagccgactttctcagagccttt


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


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


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