

Gene: BRCA1 - Sequence: NG\_005905.2  
 Transcript: NM\_007294.3 - Protein: NP\_009225.1  
 LRG: LRG\_292t1 - Date : Thursday 11<sup>th</sup> June, 2015

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

Exon 1 | Start: 92501 | End: 92713 | Length: 212

. . . . .  
 tacttatatttaccgaaactggagacctccattagggcggaaagagtgggggattgggac

. . . . .  
 ctcttcttacgactgctttggacaataggtagcgattctgaccttcgtacagcaattact

. . . . .  
 gtgatgcaataagccgcaactggaagagtagaggctagagggcaggcactttatggcaaa

. . . . .  
 ctcaggtagaattcttcctcttccgtctctttcctttacgtcatccgggggcagactgg

. . . . .  
 gtggccaatccagagccccgagagacgcttggtctcttctgtccctcccatcctctgatt

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

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

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

|-49      |-39      |-29      .      .      .      .  
 TCAGGAGGCCTTCACCCTCTGCTCTGGGTAAAGgtagtagagtcccggaaggacagg

. . . . .  
 gggcccaagtgatgctctgggggtactggcgtgggagagtggatttccgaagctgacagat

. . . . .  
 ggggtattctttgacgggggtaggggcggaacctgagaggcgtaaggcgttgtgaaccct

. . . . .  
ggggaggggggcagttttaggtcgcgaggaagcgctgaggatcaggaagggggcactg  
  
. . . . .  
agtgtccgtgggggaatcctcgtgataggaactggaatatgccttgagggggacactatg  
  
. . . . .  
tctttaaaaacgtcggctggtcatgaggtcagg

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

```
. . . . .
aggctaccaccacctacccggtcagtcactcctctgtagctttctctttcttggagaaag

. . . . .
gaaaagaccaaggggttgagcaaatatgtgaaaaattcagaatttatgttgtctaata

. . . . .
tacaaaaagcaacttctagaatctttaaaaataaaggacgttggtcattagttctttggtt

. . . . .
tgtattattctaaaaccttccaaatcttaaatcttatttttaaaatgataaaatgaa

. . . . .
gttggtcattttataaaccttttaaaagatatatatatgtttttctaattgtgttaaag

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

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

. . . . .
ttaatttgggattcctatgattatctcctatgcaaataaacagaattgaccttacatact

. . . . .
agggaagaaaagacatgtctagtaagattaggctattgtaattgctgattttcttaactg

. . . . .
aagaactttaaaaatatagaaaatgattccttggttctccatccactctgcctctcccact

. . . . .
cctctccttttcaacacaaatcctgtggtccgggaaagacagggactctgtcttgattgg

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

. . . . .  
aattcgtacgaactattatcaactaatcttttaaagtctgatgatagtatagagtattga

. . . . .  
agggatcaatataattctgttttgatatctgaaagctcactgaaggtaaggatcgtattc

. . . . .  
tctgctgtattctcagttcctgacacagcagacatttaataaatattgaacgaacttgag

. . . . .  
gccttatgttgactcagtcataacagctcaaagttgaacttattcactaagaatagcttt

. . . . .  
atttttaataaattattgagcctcatttattttctttttctccccctaccctgctag

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

. . . . .  
ttgaatgtgttatgtggctccattattagcttttgttttgtccttcataaccagaaa

. . . . .  
cacctaactttatagaagctttactttcttcaattaagtgagaacgaaaaatccaactcc

. . . . .  
atttcattctttctcagagagtatatagttatcaaaagttggttgtaatcatagttcctg

. . . . .  
gtaaagtttgacatatattatcttttttttttttttgagacaaagtctcgctctgtcg

. . . . .  
cccaggctggagtgagtgcatgatcttggtcactgcaacctccgcccccg

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

```
. . . . .
tatgaatatatcattaaatatgccatattaactttttattaagttttatgtgatcataaca

. . . . .
gtaagccatatgcatgtaagttcagttttcatagatcattgcttatgtagtttaggtttt

. . . . .
tgcttatgcagcatccaaaaacaattaggaaactattgcttgtaattcacctgccattac

. . . . .
tttttaaatggctcttaagggcagttgtgagattatctttcatggctatttgcccttttg

. . . . .
agtattctttctacaaaaggaagtaaattaaattgttctttctttctttataatttatag

      |141      |151      |161      |171      |181      |191
ATTTTGCA TGCTGAAACTTCTCAACCAGAAGAAAGGGCCTTCACAGTGTCTTTATGTAA
  F  C  M  L  K  L  L  N  Q  K  K  G  P  S  Q  C  P  L  C  K
                |51                      |61

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

. . . . .
taggaaaaagtagaaattatttaataacatagcgttcctataaaaccattcatcagaaaa

. . . . .
atttataaaagagtttttagcacacagtaaattatttccaaagttattttcctgaaagtt

. . . . .
ttatgggacatctgccttatacaggtattagaaacttactgcctttctctaattgcttcta

. . . . .
gtgtaaaaacttgcagacttatgtaaagtagggctgtatcgccgtgccccattgtctgt

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

. . . . .  
aaattaaacaaaaaaaaaagtactctagttttctatgcaatgcattatatctgctgtgga

. . . . .  
tttagggcagtattatatcagataattttaggcatttggtaggcttaaataatgaatgacaaa

. . . . .  
aagttactaaatcactgccatcacacggtttatacagatgtcaatgatgtattgattata

. . . . .  
gagggttttctactgttgctgcatcttatttttatttgtttacatgtcttttcttatttta

. . . . .  
gtgtccttaaaaggttgataatcacttgctgagtggtgttttctcaacaatttaatttcag

|  |                       |     |     |     |     |
|--|-----------------------|-----|-----|-----|-----|
| 221  | 231                   | 241 | 251 | 261 | 271 |
| GAGCCTACAAGAAAGTACGAGATTTAGTCAACTTGTTGAAGAGCTATTGAAAAATCATTG |                       |     |     |     |     |
| 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 | . | . | . | . | . | . |
| TGCTTTTCAGCTTGACACAGGTTTGGAGTgtaagtgttgaatatccaagaatgacactc |     |     |   |   |   |   |   |   |
| A F Q L D T G L E Y   |     |     |   |   |   |   |   |   |
|   | 101 |     |   |   |   |   |   |   |

. . . . .  
aagtgtgtccatgaaaactcaggaagtttgcacaattactttctatgacgtggtgataa

. . . . .  
gaccttttagtctagggttaatttttagttctgtatctgtaatctatttttaaaaaattact

. . . . .  
cccactgggtctcacaccttattttatcaatcgtaagggtgcacatttttcacatcttaaca

. . . . .  
tctctgaaattgggaacattttactattgagggtgtgtcatttgtttaatttggtgtgctt

. . . . .  
tctttcttagtgatacagaaaataatagt

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

. . . . .  
tacattgttggtgtcttagcttttagtgaaatacagtattgataggcaaatttcttagtgt

. . . . .  
taaggtagaaaacaaggactctaaataactttgatggctctgtgtatttgttttgtttcc

. . . . .  
taggagtagaaatttccagttgattttttaaaatttgatttttaaaaaaatcacaggtaa

. . . . .  
ccttaatgcattgtcttaacacaacaaagagcatatagggttctcttggtttccttg

. . . . .  
attataattcatatatttttctctaactgcaaacataatgttttcccttgatttttacag

          |311      |321      |331      |341      |351      |361  
ATGCAAAACAGCTATAATTTTGCAAAAAAGGAAAAATAACTCTCCTGAACATCTAAAAGATG  
  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      .      .      .      .      .      .  
AACCCGAAAAATCCTTCCTTGgtaaaaccatttgttttcttcttcttcttcttcttctt  
  P  E  N  P  S  L

. . . . .  
cttttttttttctttttttttttgagatggagtccttgctctgtggcccaggctagaagc

. . . . .  
agtcctcctgccttagcccccttagtagctgggattacaggcacgcgccaccatgccagg

. . . . .  
ctaatttttgatttttagtagagacggggtttcatcatgttgccaggctggtctcgaa

. . . . .  
ctcctaacctcagtgatccaccacctcggctcccaaattgctgggattacaggtgtg

. . . . .  
agccactgtgcccggcggt

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

. . . . .  
actactactattatTTTgtagagactgggtctcactctgttgcttatgctggctcttgaac

. . . . .  
tcctggcctcaagcagtcctgctccagcctcccaaagtgctgggattataggcatgagct

. . . . .  
accgctcccagccccagacattttagtgtgtaaattcctgggcattttttccaggcatca

. . . . .  
tacatgttagctgactgatgatggcgaatttattttgtccatgggtgcaagtttctcttc

. . . . .  
aggaggaaaagcacagaactggccaacaattgcttgactgttctttaccatactgttttag

          |451      |461      |471      |481      |491      |501  
CAGGAAACCACTCTCAGTGTCCAACCTCTTAACCTTGGAACCTGTGAGAACTCTGAGGACA  
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      . . .  
AAGCAGCGGATACAAACCTCAAAAGACGTCTGTCTACATTGAATTGGGtaagggtctcagg  
K Q R I Q P Q K T S V Y I E L G  
          |171                          |181

. . . . .  
ttttttaagtatttaataataattgctggattccttatcttatagttttgcaaaaatct

. . . . .  
tggtcataatttgatTTTgtggtaggcagctttgggaagtgaattttatgagccctatgg

. . . . .  
tgagttataaaaaatgtaaaagacgcagttccacctgaagaatcttacttttaaaaagg

. . . . .  
gagcaaaagaggccaggcatgggtggctcacacctgtaatccagcactttgggagggcaa

. . . . .  
agtgggtggatcacctgaggtcgggagttcgagaccagcctagcca



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

```
. . . . .
tagaaacgggggtctcactttgttggccaggctggtcttgaactcctaacctcaaataat

. . . . .
ccaccatctcggcctcctcaagtgtgggattacaggtgagagccactgtgcctggcga

. . . . .
agcccatgcctttaaccacttctctgtattacatactagcttaactagcattgtacctgc

. . . . .
cacagtagatgctcagtaaataatttctagttgaatatctgttttcaacaagtacatttt

. . . . .
tttaacccttttaattaagaaaacttttattgatttatttttgggggaaatttttag

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

. . . . .
acctttgtctatgaagctggtattttcctatttagttaatattaaggattgatgtttctc

. . . . .
tctttttaaaaatattttaacttttatttttaggttcagggatgtatgtgcagtttggtat

. . . . .
ataggtaaacacacgacttgggatttggtgtatagattttttcatcatccgggtactaa

. . . . .
gcataccccacagttttttgtttgctttcttctgaatttctccctcttcccaccttctc

. . . . .
ccctcaagtaggctggtgttttctccagactagaatcatggtattgg
```

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

. . . . .  
gtatttttagtagagatggggtttcaccatgttggccaggctggtcttgaactcatgacc

. . . . .  
tcaagtgggtccaccgcctcagcctcccaaagtgtggaattacaggcttgagccaccgt

. . . . .  
gccagcaaccatttcatttcaactagaagtttctaaaggagagagcagctttcactaac

. . . . .  
taaataagattggtcagctttctgtaatcgaaagagctaaaatgtttgatcttggtcatt

. . . . .  
tgacagttctgcatacatgtaactagtgtttcttattaggactctgtcttttccctatag

          |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

. . . . .  
acaaaatctcttggcagagtttagagtatcattctctgtcaaatgtcgtggtatggtctga

. . . . .  
tagatttaaattggtactagactaatgtacctataataagaccttctgtaactgattgttg

. . . . .  
ccctttcgttttttttttgtttgtttgtttgttttttttgagatgggggtctcactctg

. . . . .  
ttgccaggctggagtg

Exon 10 | Start: 123124 | End: 126549 | Length: 3425  
 BE AWARE: Flanking intron is shared with the following exon

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. . . . .
agttttctgatggccaatctgcttttaattcactcttagacgttagagaaataggtgtgg
. . . . .
tttctgcatagggaaaattctgaaattaaaaatttaatggatcctaagtggaaataatct
. . . . .
aggtaaataaggaattaaatgaaagagtatgagctacatcttcagtatacttggtagttta
. . . . .
tgagggttagtttctctaatatagccagttggttgatttccacctccaaggtgtatgaagt
. . . . .
atgtatTTTTTaatgacaattcagtttttgagtaccttggtatttttgatatatttcag

|671      |681      |691      |701      |711      |721
CTGCTTGTGAATTTCTGAGACGGATGTAACAAATACTGAACATCATCAACCCAGTAATA
  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
GTTCTGTTTCAAACCTTGCATGTGGAGCCATGTGGCACAAATACTCATGCCAGCTCATTAC
  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

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|   |      |      |      |      |      |
|---|------|------|------|------|------|
| 971   | 981  | 991  | 1001 | 1011 | 1021 |
| GTAAGGAAACATGTAATGATAGGCGGACTCCCAGCACAGAAAAAAGGTAGATCTGAATG   |      |      |      |      |      |
| 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 |
| CTAGAGATACTGAAGATGTTCTTGGATAACACTAAATAGCAGCATTCAGAAAAGTTAATG  |      |      |      |      |      |
| R   | D    | T    | E    | D    | V    |
|   |      |      | P    | W    | I    |
|   |      |      | T    | L    | N    |
|   |      |      | S    | S    | I    |
|   |      |      | Q    | K    | V    |
|   |      |      | N    | E    |      |
|   |      | 371  |      |      | 381  |
|   |      |      |      |      |      |
| 1151  | 1161 | 1171 | 1181 | 1191 | 1201 |
| AGTGGTTTTCAGAAAGTGATGAACTGTTAGGTTCTGATGACTCACATGATGGGGAGTCTG  |      |      |      |      |      |
| 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 |
| CCTATCGGAAGAAGGCAAGCCTCCCCAACTTAAGCCATGTAAGTAAAAATCTAATTATAG  |      |      |      |      |      |
| Y   | R    | K    | K    | A    | S    |
|   |      |      | L    | P    | N    |
|   |      |      | L    | S    | H    |
|   |      |      | V    | T    | E    |
|   |      |      | N    | L    | I    |
|   |      |      | I    | I    | G    |
|   |      | 471  |      |      | 481  |
|   |      |      |      |      |      |
| 1451  | 1461 | 1471 | 1481 | 1491 | 1501 |
| GAGCATTGTGTTACTGAGCCACAGATAATACAAGAGCGTCCCCTCACAAATAAATTAAAGC |      |      |      |      |      |
| A   | F    | V    | T    | E    | P    |
|   |      |      | Q    | I    | I    |
|   |      |      | Q    | E    | R    |
|   |      |      | P    | L    | T    |
|   |      |      | N    | K    | L    |
|   |      |      | K    | R    |      |
|   |      | 491  |      |      | 501  |



|   |      |      |      |      |      |
|---|------|------|------|------|------|
| 2051  | 2061 | 2071 | 2081 | 2091 | 2101 |
| CAATGAACAGACAAGTAAAAGACATGACAGCGATACTTTCCCAGAGCTGAAGTTAACAA   |      |      |      |      |      |
| 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 |
| ATGCACCTGGTTCTTTTACTAAGTGTTCAAATACCAAGTGAAGTTAAAGAATTTGTCAATC |      |      |      |      |      |
| 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 |
| CTAGCCTTCCAAGAGAAGAAAAAGAAGAGAACTAGAAACAGTTAAAGTGTCTAATAATG   |      |      |      |      |      |
| 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 |
| CTGAAGACCCCAAAGATCTCATGTTAAGTGGAGAAAGGGTTTTGCAAAGTAAAGATCTG   |      |      |      |      |      |
| 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 |
| TAGAGAGTAGCAGTATTTTATTGGTACCTGGTACTGATTATGGCACTCAGGAAAGTATCT  |      |      |      |      |      |
| 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 |
| CGTTACTGGAAGTTAGCACTCTAGGGAAGGCAAAAACAGAACCAAAATAAATGTGTGAGTC |      |      |      |      |      |
| 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 |
| GCATAGAAATGGAAGAAAGTGAAGTTGATGCTCAGTATTTGCAGAATACATTCAAGGTTT  |      |      |      |      |      |
| I   | E    | M    | E    | E    | S    |
|   |      |      | E    | L    | D    |
|   |      |      | A    | Q    | Y    |
|   |      |      | L    | Q    | N    |
|   |      |      | T    | F    | K    |
|   |      |      | V    | S    |      |
|   |      | 851  |      |      | 861  |

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

  

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

  

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

  

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

  

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

  

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

  

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

  

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

  

|  |      |      |      |      |      |
|--|------|------|------|------|------|
| 3071   | 3081 | 3091 | 3101 | 3111 | 3121 |
| GCACAATTAGCCGTAATAACATTAGAGAAAATGTTTTTAAAGAAGCCAGCTCAAGCAATA |      |      |      |      |      |
| T  | I    | S    | R    | N    | N    |
|  |      | I    | R    | E    | N    |
|  |      | V    | F    | K    | E    |
|  |      | A    | S    | S    | S    |
|  |      |      | N    | I    |      |
|  |      | 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 |
| TTAGATTAGGGGTTTGTCAACCTGAGGTCTATAAACAAAGTCTTCCTGGAAGTAATTGTA |      |      |      |      |      |
| 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 |
| AGCATCCTGAAATAAAAAAGCAAGAATATGAAGAAGTAGTTCAGACTGTTAATACAGATT |      |      |      |      |      |
| H P E I K K Q E Y E E V V Q T V N T D F                      |      |      |      |      |      |
|  |      |      |      | 1111 | 1121 |
|  |      |      |      |      |      |
| 3371   | 3381 | 3391 | 3401 | 3411 | 3421 |
| TCTCTCCATATCTGATTTTCAGATAAAGTGAACAGCCTATGGGAAGTAGTCATGCATCTC |      |      |      |      |      |
| 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 |
| AGGTTTGTCTGAGACACCTGATGACCTGTAGATGATGGTGAAATAAAGGAAGATACTA   |      |      |      |      |      |
| 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 |
| GTTTTGCTGAAAATGACATTAAGGAAAGTTCTGCTGTTTTAGCAAAAGCGTCCAGAAAG  |      |      |      |      |      |
| 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 |
| GAGAGCTTAGCAGGAGTCCTAGCCCTTTACCCATACACATTTGGCTCAGGGTTACCGAA  |      |      |      |      |      |
| 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 |
| GAGGGGCCAAGAAATTAGAGTCTCAGAAGAGAACTTATCTAGTGAGGATGAAGAGCTTC  |      |      |      |      |      |
| G A K K L E S S E E N L S S E D E E L P                      |      |      |      |      |      |
|  |      |      |      | 1211 | 1221 |





. . . . .  
gctaggacgtcatctttgactgaatg

Exon 11 | Start: 126952 | End: 127040 | Length: 88  
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . .
agctttaacatcctaattactggtggacttacttctggtttcattttataaaagcaaadc
. . . . .
caggtgtcccaaagcaaggaatttaatacattttgtgtgacatgaaagtaaaccagtcct
. . . . .
gccaatgagaagaaaaagacacagcaagttgcagcgtttatagtctgcttttacatctga
. . . . .
. . . . . |4101 |4111 |4121 |4131
acctctgtttttgttatttaagGTGAAGCAGCATCTGGGTGTGAGAGTGAAACAAGCGTC
                        E A A S G C E S E T S V
                        |1371

. . . . .
TCTGAAGACTGCTCAGGGCTATCCTCTCAGAGTGACATTTTAACCACTCAGgtaaaaagc
S E D C S G L S S Q S D I L T T Q
|1381 |1391

. . . . .
gtgtgtgtgtgtgcacatgcgtgtgtgtggtgtcctttgcattcagtagtatgtatccca
. . . . .
cattcttaggtttgctgacatcatctctttgaattaatggcacaattgtttgtggttcac
. . . . .
tgtctccttaaattagactgtaagcaccttgatggaactcatactaccttttatttcaca
. . . . .
cacacgcacacgcgcacacacagcctacacatacactgcctagctcattgtagcatacta
. . . . .
aatactgatttttaataagtaaaccttcgaaaccatttgctaatacc

```

Exon 12 | Start: 135409 | End: 135580 | Length: 171

```
. . . . .
tattttttcactccctagcttttaaagaaaataaccaacttcaaaaggacatcacataa

. . . . .
catcaagtctatttgggggaatttgaggatttttccctcactaacatcatttggaata

. . . . .
atthcatgggcattaattgcatgaatgtggttagattaaaaggtgttcagctagaacttg

. . . . .
tagttccatactaggtgatttcaattcctgtgctaaaattaatttgatgatataatttc

. . . . .
atthaatggaaagcttctcaaagtatttcatthttcttggtgccatttatcgthtttgaag

      |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      A  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

. . . . .
gccttggttcttgtccctgctcacaactaatataaccagtcagagggacccaaggcagtca

. . . . .
ttcatgtgtcatctgagtacctacaacaagtagatgctatggggagcccatggaagata
```

. . . . .  
catggtataacaacatagctcttgctctattggaagctaagtggaatgggaga

Exon 13 | Start: 141370 | End: 141496 | Length: 126

```
. . . . .
tcaggccaaggaatatagatttttttttcagccttgctcagctgggtgtctttattt

. . . . .
actctgtcttaaagtggtccttttattatcattatttttttaattcattgaattccatt

. . . . .
tggtgctagcatctgtctgttgcttgcttggtttataaaattctgcctgatatacttg

. . . . .
tttaaaaaccaatttggtgatcatagattgatgcttttgaaaaaatcagtattctaacc

. . . . .
tgaattatcactatcagaacaaagcagtaaagtagatttgttttctcattccatttaaag

|4361      |4371      |4381      |4391      |4401      |4411
CAGTATTAAC TTCACAGAAAAGTAGTGAATACCCTATAAGCCAGAATCCAGAAGGCCTTT
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
TGGAAGGtaagaaacatcaatgtaaagatgctgtggtatctgacatctttatttatatt
E R

. . . . .
gaactctgattgttaatttttttcaccatactttctccagttttttgcatacaggcattt

. . . . .
atacacttttattgctctaggatacttcttttgtttaacacctatataggttttttgaacc

. . . . .
tataacataagctacaacatgagaaatgtgcggttagatagatatgtcccttctgaaggt

. . . . .
cagaaaaaatataatggaggtaaaacctgaacaagcttggaactgatggttagacttct

. .
tcaaggc
```

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

. . . . .  
agcctcccgagtagctgagattacaggcgccagccaccacaccagctactgacctgctt

. . . . .  
ttaaacagctgggagatatggtgcctcagaccaaccaaccccatgttatatgtcaaccc

. . . . .  
tgacatatggcaggcaacatgaatccagacttctaggctgtcttgcgggctcttttttg

. . . . .  
ccagtcatttctgatctctctgacatgagctgtttcatttatgctttggctgccagcaa

. . . . .  
gtatgatttgtcctttcacaattggtggcgatggttttctccttcatttatctttctag

|   |      |      |      |      |      |
|---|------|------|------|------|------|
| 4491  | 4501 | 4511 | 4521 | 4531 | 4541 |
| GTCATCCCTTCTAAATGCCCATCATTAGATGATAGGTGGTACATGCACAGTTGCTCTGG |      |      |      |      |      |
| 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 |
| GAGTCTTCAGAATAGAACTACCCATCTCAAGAGGAGCTCATTAAGGTTGTTGATGTGGA |      |      |      |      |      |
| 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 |
| GGAGCAACAGCTGGAAGAGTCTGGGCCACACGATTTGACGGAACATCTTACTTGCCAAG |      |      |      |      |      |
| E Q Q L E E S G P H D L T E T S Y L P R                     |      |      |      |      |      |
| 1541  |      |      |      | 1551 |      |

|             |  |
|-------------|--|
| 4671        | . . . . .  |
| GCAAGATCTAG | gtaatatatttcattctgctgtattggaacaaacactttgattttactctga |
| Q D L E     |  |

. . . . .  
atcctacataaagatattctggttaaccaacttttagatgtactagtctatcatggacac

. . . . .  
ttttgttatacttaattaagcccacttttagaaaaatagctcaagtgttaatcaaggttta

. . . . .  
cttgaaaattattgaaactgttaatccatctatatattttaattaatggtttaactaatgat

. . . . .  
tttgaggatgagggagtcttggtgtactctaaatgtattatttcaggccaggcatagtgg

. . .  
ctcacgcctgt



Exon 15 | Start: 146746 | End: 147056 | Length: 310

```
. . . . .
tctaaaattatactattcctatgactaaacctttgcatatatcttttatctccctaggat

. . . . .
atatttctaaaactagcattgttgactgaaagtgtaaatacgtgttaaggtgttgctac

. . . . .
ataatgccatatttccttttaggaaactaagctactttggattccaccaacactgtat

. . . . .
tcatgtaccatttttctcttaacctactttattggctcttttaattcttaacagagac

. . . . .
cagaactttgtaattcaacattcatcgttggtgtgtaaattaaacttctcccattcctttcag

      |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
CTTCTGAAGACAGAGCCCCAGAGTCAGCTCGTGTGGCAACATACCATCTTCAACCTCTG
  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
CATTGAAAGTTCCCAATTGAAAGTTGCAGAATCTGCCAGAGTCCAGCTGCTGCTCATA
  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      . . . . .
CAGAAGAATTTgtgagtgatccatatgtatctccctaatagacttaacaacatt
      E E F
      |1661

. . . . .
ctggaaagagttttatgtaggtattgtcaattaataacctagaggaagaatctagaaa

. . . . .
caatcacagttctgtgtaatttaatttcgattactaatttctgaaaatttagatctagat

. . . . .
aaagctatagtggtgattatttatgtatatattacttgagaaaataattattaaatatta

. . . . .
gtggaaaagctatactttgggtatgatataggactttcgaattggaattttcctttctat

. . . . .
ctgtaaaagca

```

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

```
. . . . .
gagacttcaggtgtcttagaattttttaaatgtaccctttctgagaaaaacagagactta

. . . . .
aagctaggataactgggtattctatttttttttttttttttttttacctccagcctgggt

. . . . .
gacagagcaagactctgtctaaaaaaaaaaaaaaaaaattcactttaaatagttccagg

. . . . .
acacgtgtagaacgtgcaggattgctacataggtaaacatatgccatggtggaataacta

. . . . .
gtattctgagctgtgtgctagaggtaactcatgataatggaatatttgatttaatttcag

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

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

. . . . .
tctgctgcataaaaccacatgaggcgaggcacggtggcgcatgcctgtaatcgcagcact

. . . . .
ttgggaggccgaggcgggcagatcacgagattaggagatcgagaccatcctggccagcat

. . . . .
ggtgaaaccccgctctctactaaaaataaaaaaattagctgggtgtggtcgcgtgcgcct

. . . . .
gtagtcccagctactcgtgaggctgaggcaggagaatcacttgaaccggggagatggagg

. . . . .
ttgcagtgagccgagatcatgccactgc
```

Exon 17 | Start: 154033 | End: 154110 | Length: 77  
 BE AWARE: Flanking intron is shared with the following exon

. . . . .  
 tataatggagatctatagctagccttggcgtctagaagatgggtgttgagaagagggagt  
 . . . . .  
 ggacagatatcttctgtgtcttaacttcatatcagcctcccctagacttccaaatatcc  
 . . . . .  
 atacctgctggttataattagtggtgttttcagcctctgattctgtcaccaggggtttta  
 . . . . .  
 gaatcataaatccagattgatcttgggagtgtaaaaaactgaggctcttttagcttcttag  
 . . . . .  
 gagagcacttcctgattttgttttcaacttctaatacctttgagtgtttttcattctgcag

|  |      |      |      |      |      |
|--|------|------|------|------|------|
| 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 | . | . | . | . | . | . | . |
| GGGTAGTTAGCTATTCTGtaagtataataactatttctcccctcctccctttaacacctc |      |   |   |   |   |   |   |   |
| V V S Y F W  |      |   |   |   |   |   |   |   |

. . . . .  
 agaattgcatttttacacctaacgtttaacacctaagggttttctgatgctgagtctga  
 . . . . .  
 gttacaaaaggctctttaattgtaataactaaactacttttatctttaatatcactttgtt  
 . . . . .  
 cagataagctggtgatgctgggaaaatgggtctcttttataactaataggacctaactctg  
 . . . . .  
 ctccctagcaatgtagcatatgagctag

Exon 18 | Start: 154611 | End: 154651 | Length: 40  
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . .
ggatttatttaatagtcggcaggaatccatgtgcagcaggcaaacttataatgtttaaat
. . . . .
taaacatcaactctgtctccagaaggaaactgctgctacaagccttattaaagggtgtg
. . . . .
gcttttagagggaaggacctctcctctgtcattcttcctgtgctcttttgtgaatcgtga
. . . . .
cctctctatctccgtgaaaagagcacgttcttctgctgtatgtaacctgtcttttctatg
. . . . .
. . . . .
atctcttttagGGGTGACCCAGTCTATTAAGAAAAGAAAAATGCTGAATGAGgtaagtact
      |5161      |5171      |5181      |5191      .
      V T Q S I K E R K M L N E
      |1721      |1731
. . . . .
tgatgttaciaaactaaccagagatattcattcagtcatatagttaaaaatgtatttgctt
. . . . .
ccttccatcaatgcaccactttccttaacaatgcacaaattttccatgataatgaggatc
. . . . .
atcaagaattatgcaggcctgcactgtggctcatacctataatcccagcgctttgggagg
. . . . .
ctgaggcgcttggtacacctgatgtcgggagttcaagaccagcctgaccaacatggagaa
. . . . .
accccgctttctactaaaaatacaaaattagccgggcttggtggcacttgcc

```

Exon 19 | Start: 160849 | End: 160932 | Length: 83

```
. . . . .
gcattcaaaagattctcctgcctcagcctcccaagtagctgggattacaggtgcctgcc
. . . . .
ccacgcccaactaatttttgtatttttagtagagatgaggtttcaccatgttggtcaga
. . . . .
ctggtgtcgaactcctgacctcaagtgatctgcctgcctcagtctccaaagtgctagga
. . . . .
ttacaggggtgagccactgcgcctggcctgaatgccttaaatatgacgtgtctgctccac
. . . . .
ttccattgaaggaagcttctcttctcttatcctgatgggttggtttggtttctttcag
      |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
. . . . .
attacatacatcacagtgctagatactttcacacaggttcttttttctactcttccatcc
. . . . .
caaccacataaataagtattgtctctactttatgaatgataaaactaagagatttagaga
. . . . .
ggctgtgtaatttggattcccgctctcgggttcagatcttagctgataagtggaagagctg
. . . . .
ggactttaagcagatgagaatcta
```

Exon 20 | Start: 166867 | End: 166921 | Length: 54

```
. . . . .
cttggcctgattggtgacaaaagtgagatgctcagtccttgaatgacaaagaatgcctgt

. . . . .
agagtgcagggtcaactacatatgcacttcaagaagatcttctgaaatccagtagtggtct

. . . . .
ggacattggactgcttgctccctgggaagtagcagcagaaatcatcaggtggtgaacagaa

. . . . .
gaaaaagaaaagctcttcctttttgaaagtctgttttttgaataaaagccaatattcttt

. . . . .
tataactagattttccttctctccattcccctgtccctctctcttcctctcttcttccag

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

. . . . .
agcctgggagaaccccagagttccagcaccagcctttgtcttacatagtggagtattata

. . . . .
agcaagatcccacgatgggggttcctcagattgctgaaatggttagaggctattctatt

. . . . .
tctctaccactctccaaacaaaacagcacctaaatgttatcctatggcaaaaaaaaacta

. . . . .
taccttggtcccccttctcaagagcatgaagggtggttaatagttaggattcagtatgttat

. . . . .
gtgttcagatggcggttgagctgctgtagtgccaacatgttagtgagaaaaatc
```

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

. . . . .  
attaatggaaattagatctttgattttttttctttcaagcattttatttgagagactat

. . . . .  
caaaccttataccaagtggccttatggagactgataaccagagtacatggcatatcagtg

. . . . .  
gcaaattgacttaaaatccatacccctactattttaagaccattgtcctttggagcagag

. . . . .  
agacagactctccattgagaggtcttgctataagccttcacccggagagtgtagggtag

. . . . .  
agggcctgggttaagtatgcagattactgcagtgattttacatctaaatgtccattttag

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

          |5401  
TCACCCTTGGCACAgtaagtattgggtgccctgtcagagaggaggacacaatattctct  
  T  L  G  T  
          |1801

. . . . .  
cctgtgagcaagactggcacctgtcagtccttatggatgccctactgtagcctcagaag

. . . . .  
tcttctctgcccacatacctgtgccaaaagactccatctgtaagggatgggtaaggattt

. . . . .  
gagaactgcacatattaaatatactgaggggaagactttttccctctaactctttttcca

. . . . .  
tatgtccctccccctcctctctgtgactgccccagcatactgtgtttcaacaaatcatca

. . .  
agaaatgatgggct



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

. . . . .  
ccaggagtttgagaccagcctgggcaacatggcaaaaccctgtctctacaaaaatacaa

. . . . .  
aaaaattagccaggggtggtgtacgtgtctgtagttccagctacttaggaggctgagat

. . . . .  
ggaaggattgcttgagcccaggaggcagaggtggcagtgagctgagatcacaccactgca

. . . . .  
ctccagcctgggtgacagagcaagaccctgtctcaaaaacaaacaaaaaaatgatgaag

. . . . .  
tgacagttccagtagtcctactttgacactttgaatgctctttccttccctggggatccag

          |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

. . . . .  
actcattacctggtgcttgagtagcacagtTccttggcacattttaaatatttgTtgaatg

. . . . .  
aatggctaaaatgTctttttgatgTttttattgTtatttgTtttatattgTaaaagtaat

. . . . .  
acatgaactgTttccatggggTgggagtaagatatgaatgTtcatcacaaaaacataaat

. . . . .  
caaggccgggcatggTggctcatgcctataattccagcactttgggaggtcaagatggag

.  
g

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

```
. . . . .
taaaaatacaaaaattagctgggtgtgatggcatgtgcctgtaattccagctactcagga

. . . . .
ggcagagacaggagaattgcttgaaccaggaggcggagggtgaatgagccgagattgcg

. . . . .
ccatcacactctagcctcggcgacagagcaagactccgtctcaaaaaaaaaaaaaaaaaa

. . . . .
ttagcttctacctcattaatcctaagaactcatacaaccaggaccctggagtcgattgat

. . . . .
tagagcctagtccaggagaatgaattgacactaatctctgcttggttctctgtctccag

|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
CACTCTACCAGTGCCAGGAGCTGGACACCTACCTGATACCCAGATCCCCACAGCCACT
 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
TTTTCTGCTTGAAGTCTCCCTTGAAATCTGCCATGAGCACAAAATTATGGTAATTTTTC

|*241     |*251     |*261     |*271     |*281     |*291
ACCTGAGAAGATTTTAAAACCATTTAAACGCCACCAATTGAGCAAGATGCTGATTCATTA
```

|   |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|
| *301  | *311  | *321  | *331  | *341  | *351  |
| TTTATCAGCCCTATTCTTTCTATTTCAGGCTGTTGTTGGCTTAGGGCTGGAAGCACAGAGT |       |       |       |       |       |
| *361  | *371  | *381  | *391  | *401  | *411  |
| GGCTTGGCCTCAAGAGAATAGCTGGTTTCCCTAAGTTTACTTCTCTAAAACCTGTGTTT   |       |       |       |       |       |
| *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  |
| CCTGTAATCCCAGCACTTTGGGAGGCCAAGGTGGGCAGATCACTGGAGGTCAGGAGTTTCG |       |       |       |       |       |
| *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  |
| GACAGTGAGACTGTGGCTCAAAAAAAAAAAAAAAAAAGGAAAATGAACTAGAAGAGAT    |       |       |       |       |       |
| *901  | *911  | *921  | *931  | *941  | *951  |
| TTCTAAAAGTCTGAGATATATTGCTAGATTTCTAAAGAATGTGTTCTAAACAGCAGAA    |       |       |       |       |       |
| *961  | *971  | *981  | *991  | *1001 | *1011 |
| GATTTTCAAGAACCGGTTTCCAAAGACAGTCTTCTAATTCCTCATTAGTAATAAGTAAAA  |       |       |       |       |       |
| *1021   | *1031 | *1041 | *1051 | *1061 | *1071 |
| TGTTTATTGTTGTAGCTCTGGTATATAATCCATTCCTCTTAAAAATATAAGACCTCTGGCA |       |       |       |       |       |
| *1081   | *1091 | *1101 | *1111 | *1121 | *1131 |
| TGAATATTTTATATCTATAAAATGACAGATCCCACCAGGAAGGAAGCTGTTGCTTTCTTT  |       |       |       |       |       |
| *1141   | *1151 | *1161 | *1171 | *1181 | *1191 |
| GAGGTGATTTTTTCTTTGCTCCCTGTTGCTGAAACCATACAGCTTCATAAATAATTTT    |       |       |       |       |       |

|\*1201    |\*1211    |\*1221    |\*1231    |\*1241    |\*1251  
 GCTTGCTGAAGGAAGAAAAAGTGTTCATTAACCCATTATCCAGGACTGTTTATAGCT

|\*1261    |\*1271    |\*1281    |\*1291    |\*1301    |\*1311  
 GTTGGAAGGACTAGGTCTTCCCTAGCCCCCAGTGTGCAAGGGCAGTGAAGACTTGATT

|\*1321    |\*1331    |\*1341    |\*1351    |\*1361    |\*1371  
 GTACAAAATACGTTTGTAAATGTTGTGCTGTTAACTGCAAATAAACTTGGTAGCAA

|\*1381 . . . . .  
 CACTTCCAccatgaatgactgttcttgagacttaggccagccgactttctcagagccttt

. . . . .  
 tcactgtgcttcagtctccactctgtaaaatgggggtaatgatagtatctacctcctag

. . . . .  
 gatttattgaggcagcttaaataccttttgatcttctgttgctgcaaaacaaattgtt

. . . . .  
 gcaaggtcagaagtctgaggtggctcaactgtttctttgtttcaggtttcatgaggccaa

. . . . .  
 aataaaggtgttcgcagggcggttcccttctagaggctctgggtccttgagttctagg

. .  
 actaagat

LRG Parser: Version: 1.3, Version Date: 11/02/2015  
Reader: Version: 1.3, Version Date: 11/02/2015  
Writer: Version: 1.3, Version Date: 11/02/2015  
Control: Version: 1.3, Version Date: 11/02/2015