

Gene: MLH1 - Sequence: NG\_007109.2  
 Transcript: NM\_000249.3 - Protein: NP\_000240.1  
 Date : Thursday 14<sup>th</sup> January, 2016

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: 5001 | End: 5314 | Length: 313

```

. . . . .
tcttgcttcttttgggcgtcatccacattctgcgggaggccacaagagcagggccaacgt

. . . . .
tagaaaggccgcaaggggagaggaggagcctgagaagcgccaagcacctcctccgctctg

. . . . .
cgccagatcacctcagcagaggcacacaagcccgggtccggcatctctgctcctattggc

. . . . .
tggatatttctgtattccccgagctcctaaaaacgaaccaataggaagagcggacagcgat

. . . . .
ctctaacgcgcaagcgcatatccttctaggtagcgggcagtagccgcttcagggaggagac

      |-189      |-179      |-169      |-159      |-149      |-139
GAAGAGACCCAGCAACCCACAGAGTTGAGAAATTTGACTGGCATTCAAGCTGTCCAATCA

      |-129      |-119      |-109      |-99      |-89      |-79
ATAGCTGCCGCTGAAGGGTGGGGCTGGATGGCGTAAGCTACAGCTGAAGGAAGAACGTGA

      |-69      |-59      |-49      |-39      |-29      |-19
GCACGAGGCACTGAGGTGATTGGCTGAAGGCACTTCCGTTGAGCATCTAGACGTTTCCTT

      |-9      |1      |11      |21      |31      |41
GGCTCTTCTGGCGCCAAAATGTCGTTTCGTGGCAGGGGTTATTCGGCGGCTGGACGAGACA
      M S F V A G V I R R L D E T
      |1      |11

      |51      |61      |71      |81      |91      |101
GTGGTGAACCGCATCGCGCGGGGGAAGTTATCCAGCGGCCAGCTAATGCTATCAAAGAG
V V N R I A A G E V I Q R P A N A I K E
      |21      |31

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      |111      . . . . .
ATGATTGAGAACTGgtacggagggagtcgagccgggctcacttaagggtacgacttaac
M I E N C

      . . . . .
gggccgcgtcactcaatggcgcggacacgcctctttgcccgggcagaggcatgtacagcg

      . . . . .
catgcccacaacggcggaggccgccgggttcctgacgtgccagtcaggccttctccttt

      . . . . .
tccgcagaccgtgtgtttctttaccgctctccccgagaccttttaagggttgtttggag

      . . . . .
tgtaagtggaggaatatacgtagtgttcttaatggtaccgttaactaagtaaggaagc

      . . .
cacttaatttaaaa

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Exon 2 | Start: 8270 | End: 8360 | Length: 90

```
. . . . .
ttgagaagagacatctgccaaaagaaatctatttttaacttcacttgctgtctttcctag

. . . . .
aggaacagaaatagtgtgaatgtcctattagaaatgatggttgctctgcccgtctcttc

. . . . .
cctctctctcacacaatatgtaaactcatacagtgtatgagcctgtaagacaaaggaaaa

. . . . .
acacgttaatgaggcactattgtttgtatttggagtttgttatcattgcttggctcatat

. . . . .
taaaatatgtacattagagtagttgcagactgataaattatctgtttgatttgccag

      |121      |131      |141      |151      |161      |171
TTTAGATGCAAAATCCACAAGTATTCAAGTGATTGTTAAAGAGGGAGGCCTGAAGTTGAT
  L  D  A  K  S  T  S  I  Q  V  I  V  K  E  G  G  L  K  L  I
      |41                                |51

      |181      |191      |201      . . . . .
TCAGATCCAAGACAATGGCACCGGGATCAGGgtaagtaaaacctcaaagtagcaggatgt
  Q  I  Q  D  N  G  T  G  I  R
      |61

. . . . .
ttgtgcgcttcatggaagagtcaggacctttctctgttcttgaaactaggcttttgaga

. . . . .
tgggattttttcactgaaaaattcaacaccaacaataaatatttattgagtacctattat

. . . . .
ttgctgggcactgttcaggggatgtgtcagtgaataaaatagattaaaatctattctctt

. . . . .
ctgatgcttacattatagtgggtgggagacaaaatgggtataataaatattatattagata

. . . . .
gcattaagtgctgtggagaaaactaaagcag
```

Exon 3 | Start: 12606 | End: 12704 | Length: 98

```
. . . . .
accggggaggcggaggttgagctgagctgagatctcgccactgcacttcagcctgggtga
. . . . .
cagagcaagactctgtctcaaaggaggttgagctgagctgagatctcgccactgcacttc
. . . . .
agcctgggtgacagagcaagactctgtctcaaaaaaaaaaaaaacaaaaccaagaaaag
. . . . .
aaaaaaaaactcttctaagaggatttttttcttgattaaatcaagaaaatgggaatt
. . . . .
caaagagatttgaaaaatgagtaacatgattatttactcatcttttggtatctaacag

    |211      |221      |231      |241      |251      |261
AAAGAAGATCTGGATATTGTATGTGAAAGGTTCACTACTAGTAAACTGCAGTCCTTTGAG
K E D L D I V C E R F T T S K L Q S F E
    |71                                |81

    |271      |281      |291      |301      . . . . .
GATTTAGCCAGTATTTCTACCTATGGCTTTCGAGGTGAGgtaagctaaagattcaagaaa
D L A S I S T Y G F R G E
    |91                                |101

. . . . .
tgtgtaaaatatcctcctgtgatgacattgtctgtcatttgtagtatgtatttctcaac
. . . . .
atagataaataaggtttggtaccttttacttgttaaatgtatgcaaactctgagcaaactt
. . . . .
aatgaactttaactttcaaagactgagaattgttcataaataaactattttacctgcaga
. . . . .
gacctctgatatatgtttcttgatggaagtaccagtaccacctatgaagtttcttgtc
. . . . .
aaaaaatcaaatgtgaatctgatcattacttagatctaa
```

Exon 4 | Start: 16052 | End: 16125 | Length: 73

```
. . . . .
gaatattattaaacatgcctatagttctaccacctcaacacaattgcttattaacacatt

. . . . .
aatgttttggtgtgttttgactttttaatatgtatttttcacttggtctagtaattatg

. . . . .
ctacagattgatcatttctttttcaacatgtcatcaaagcaagtgagcaaagtgctcatc

. . . . .
gttgccacatattaataacaaaatggaagcagcagttcagataacctttccctttggtgag

. . . . .
gtgacagtgggtgaccagcagtgagtttttctttcagtcctattttcttttcttccttag

      |311      |321      |331      |341      |351      |361
GCTTTGGCCAGCATAAGCCATGTGGCTCATGTTACTATTACAACGAAAACAGCTGATGGA
A L A S I S H V A H V T I T T K T A D G
                        |111                        |121

      |371
AAGTGTGCATACAGgtatagtgctgacttcttttactcatatatattcattctgaaatgt
K C A Y R

. . . . .
attttttgccctaggtctcagagtaatcctgtctcaacaccagtgttatcttttttggcag

. . . . .
agatcttgagtacgttttcttttctccttattgataaattgataatcctcaaggatgatt

. . . . .
attaggtgatactcttacttcatggattcttaaagatatgatttaacatattacaagtg

. . . . .
cctagcaaggtgtctgttacacgtaggtattttaagtaaaggtagctgctgatgtaatt

. . .
tctgcccctttgcc
```

Exon 5 | Start: 18642 | End: 18714 | Length: 72

```
. . . . .
cttgggaggctgaggcaggagaatcgcttgaacctggtaggcggagggttgtagtgagctg
. . . . .
agattgtgccattgctctccagcctgggaacaagagcaaaactccgtctcaaaaaaaaa
. . . . .
aaaaatccaattcaaatgattatggaagtagtgagaaataaacaggaaaatgataaata
. . . . .
attaagataatatataatatggctatattttaatctattgttgatatgattttctctttt
. . . . .
ccccttgggattagtatctatctctctactggatattaatttggtatatattttctcattag

|381      |391      |401      |411      |421      |431
AGCAAGTTACTCAGATGGAAAACTGAAAGCCCCTCCTAAACCATGTGCTGGCAATCAAGG
 A S Y S D G K L K A P P K P C A G N Q G
      |131                      |141

|441      |451      . . . . .
GACCCAGATCACGgtaagaatggtacatgggagagtaaattggtgaagctttgtttgtat
 T Q I T
      |151

. . . . .
aaatatggaataaaaaataaaattgcttctaagttttcagggttaataaaaaatgaatt
. . . . .
tgcactagttaatggagggtccaagatatcctctaagcaagataaatgactattggcttt
. . . . .
tgtggcatggcagcctgccacgtccttgcttttttaagggctaggagattctttattgg
. . . . .
gatggcaaaagtcaatggcagggtagttgtcattgaaagaagattaagcttgaccccaga
. . . . .
aggcatgggttag
```

Exon 6 | Start: 20465 | End: 20556 | Length: 91

. . . . .  
tctcctgagcaggatcatgctttgtcttcataatctgtacaaagcaaagactctgaca

. . . . .  
caaagctagccccagtgcatagttgagaaatcagtgaatgaatgtgggaggcaggaaaa

. . . . .  
atgtcctttaattcttctgttaatgctgtcttatccctggccccagtcagtgcttagaac

. . . . .  
tgtgctgttggtaaatataattggattcactatcttaagacctcgcttttgccaggacat

. . . . .  
cttgggttttatcttcaagtacttctatgaatttacaagaaaaatcaatcttctgttcag

          |461      |471      |481      |491      |501      |511  
GTGGAGGACCTTTTTTACAACATAGCCACGAGGAGAAAAAGCTTTAAAAAATCCAAGTGAA  
V E D L F Y N I A T R R K A L K N P S E  
                          |161                          |171

          |521      |531      |541      . . . . .  
GAATATGGGAAAAATTTTGAAGTTGTTGGCAGgtacagtcctccaaatctgggagtgggtct  
E Y G K I L E V V G R  
                          |181

. . . . .  
ctgagatgtgtcatcaaagtaatgtgttctagtgtctatacattgaacagttgctgagct

. . . . .  
agatggtgaaaagtaaaactagcttacagatagtttctggtcaaggtttagccaccaatt

. . . . .  
ttgcagtttctctcatctcccaggaaagagcagttggtctttagatcaatgagagctct

. . . . .  
tttatggcagacaaaacaaagtgactctagccaacttgagctaaaaagaaatttagtgga

. . . . .  
aggctaggagttaccacatgaagtgtgtgcag

Exon 7 | Start: 23471 | End: 23513 | Length: 42  
BE AWARE: Flanking intron is shared with the following exon

```
. . . . .
taaaaataaataaaaaagagatagtggcgtgatatccttgattctatcagcaacctataa

. . . . .
aagtagagaggagtctgtgttttgattcagtcacctttagcatttttatttccatgaagt

. . . . .
ttctgctggtttatttttctgtgggtaaaaatattaataggctgtatggagatattttct

. . . . .
ttatatgtacctttgttttagattactcaactccactaatttatttaactaaaagggggct

. . . . .
ctgacatctagtgtgtgtttttggcaactcttttcttactcttttgtttttcttttcag

      |551      |561      |571      |581      . . .
GTATTCAGTACACAATGCAGGCATTAGTTTCTCAGTTAAAAAAgtaagttcttggtttat
Y S V H N A G I S F S V K K
      |191

. . . . .
gggggatggttttgttttatgaaaagaaaaaggggatttttaatagtttgctgg
```



Exon 8 | Start: 23662 | End: 23750 | Length: 88  
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . .
ggagataaggttatgatgtttcagtcctcagccatgagacaataaatccttggtgtcttctg

. . . . . |591 |601 |611 |621 |631
ctgtttgtttatcagCAAGGAGAGACAGTAGCTGATGTTAGGACACTACCCAATGCCTCA
      Q G E T V A D V R T L P N A S
                        |201 |211

      |641 |651 |661 |671 . . .
ACCGTGGACAATATTCGCTCCATCCTTTGGAAATGCTGTTAGTCGgtatgtcgataaccta
T V D N I R S I F G N A V S R
                        |221

. . . . .
tataaaaaaatcttttacatttattatcttggtttatcattccatcacattattttgaa

. . . . .
cctttcaagatattatgtgtgttaagagtttgcttttagtcaaatacacaggcttgtttta

. . . . .
tgcttcagatttgtaatggagttcttatttcacgtaatcaacactttctaggtgtatgt

. . . . .
aatctcctagattctgtggcgtgaatcatgtgttctttcaaggcttagtcttgaaaata

. . . . .
tttatagtgtagtagaactattttatcctccaatgctccttctt

```

Exon 9 | Start: 26083 | End: 26195 | Length: 112

```
. . . . .
cagtacctggcacatagcacaagtgcttgaaaacactgactgagtagggtaggtgggtga
. . . . .
gtgggtgggtgggtgggtgggtggatggatggatgggaggatgggtgggtgaatgggtga
. . . . .
acagacaaatggatggatgaatggacaggcacaggaggacctcaaatggaccaagtcttc
. . . . .
ggggccctcatttcacaaagttagtttatgggaaggaaacctgtgtttttaattctgat
. . . . .
tcttttgtaatgtttgagttttgagtattttcaaagcttcagaatctcttttctaatag

      |681      |691      |701      |711      |721      |731
AGAACTGATAGAAATTGGATGTGAGGATAAAACCCTAGCCTTCAAAATGAATGGTTACAT
E  L  I  E  I  G  C  E  D  K  T  L  A  F  K  M  N  G  Y  I
      |231                      |241

      |741      |751      |761      |771      |781      .
ATCCAATGCAAACTACTCAGTGAAGAAGTGCATCTTCTTACTCTTCATCAACCgtaagtt
S  N  A  N  Y  S  V  K  K  C  I  F  L  L  F  I  N  H
      |251                      |261

. . . . .
aaaaagaaccacatgggaaatccactcacaggaaacacccacaggaattttatgggacc
. . . . .
atggaaaaatttctgatccataggtttgattaaacatggagaaacctcatggcaaagttt
. . . . .
ggttttattgggaagcatgtataattttgtcctaagtctgtgctcagccctcccatg
. . . . .
tgctcattgctggttgactgttggagtctggttcttacctctaagaggaagcccaggaga
. . . . .
gggcataaagccagcacactgtcctcacctgatggtgtcagagtccttacgag
```

Exon 10 | Start: 29157 | End: 29250 | Length: 93

```
. . . . .
gaaagagcacagtttagtccacatgagctaattgggggcaaagggaagtgaggaggagaat

. . . . .
gtactgccttatcatgttttctattacttggctgaagtaaaacagtcccaagccgatagt

. . . . .
aagatagtgggctggaaagtggcgacaggtaaaggtgcacctttcttctgaggatgtga

. . . . .
tgtgcatatcactacagaaatgtctttcctgaggtgatttcatgactttgtgtgaatgta

. . . . .
cacctgtgacctcacccctcaggacagttttgaactggttgctttctttttattgtttag

|791      |801      |811      |821      |831      |841
ATCGTCTGGTAGAATCAACTTCCTTGAGAAAAGCCATAGAAACAGTGTATGCAGCCTATT
  R  L  V  E  S  T  S  L  R  K  A  I  E  T  V  Y  A  A  Y  L
                |271                        |281

|851      |861      |871      |881      . . . . .
TGCCCAAAAACACACACCCATTCTGTACCTCAGgtaatgtagcaccaaactcctcaacc
  P  K  N  T  H  P  F  L  Y  L  S
                |291

. . . . .
aagactcacaaggaaacagatgttctatcaggctctcctctttgaaagagatgagcatgct

. . . . .
aatagtacaatcagagtgaatcccatacaccactggcaaaaggatgttctgtcccttctt

. . . . .
acaggtacaaggcacagttttccttcatttattcactaatttagcagaacctcactaaga

. . . . .
gcctcctatatgccaggctctgcgtttagcaataaaagggaatgccatgcctcaccccatca

. . . . .
ggaggtgctgatagctttagtaggcggagtggaaac
```

Exon 11 | Start: 31961 | End: 32114 | Length: 153

```
. . . . .
accacgcccggccacttgatgaatttaattcccgcataaacctgtgagataggtaat
. . . . .
tctgttatatccactttacaaatgaagagactgaggcaaagaaagatgatgtaacttacg
. . . . .
caaagctacacagctcttaagtagcagtgccaatatttgaacacactcagactcgatcct
. . . . .
gagggttttgaccactgtgtcatctggcctcaaattcttctggccaccacatacaccatag
. . . . .
tgggctttttctccccctcccactatctaaggtaattgttctctcttattttcctgacag
      |891      |901      |911      |921      |931      |941
TTTAGAAATCAGTCCCCAGAATGTGGATGTTAATGTGCACCCCACAAAGCATGAAGTTCA
  L  E  I  S  P  Q  N  V  D  V  N  V  H  P  T  K  H  E  V  H
                |301                        |311

      |951      |961      |971      |981      |991      |1001
CTTCCTGCACGAGGAGAGCATCCTGGAGCGGGTGCAGCAGCACATCGAGAGCAAGCTCCT
  F  L  H  E  E  S  I  L  E  R  V  Q  Q  H  I  E  S  K  L  L
                |321                        |331

      |1011     |1021     |1031     . . . . .
GGGCTCCAATTCTCCAGGATGTACTTCACCCAGgtcagggcgcttctcatccagctact
  G  S  N  S  S  R  M  Y  F  T  Q
                |341

. . . . .
tctctggggcctttgaaatgtgcccggccagacgtgagagcccagatttttgcctgttat
. . . . .
ttaggaactttctttgcaagtattacctggatagttttaacattttcttctttgaaccta
. . . . .
gttataaagggtattgtgctgttgttcctaggccttagagtcataaggcctgagctcacttc
. . . . .
ctcactttgcctccatctggaaccttagaccaacttcctaggaaaacgagctgtctgaaa
```

. . . . .  
acagaatagggtgcctcttcaatgtgctcttcac

Exon 12 | Start: 37288 | End: 37658 | Length: 370

. . . . .  
ttctgggagcaccccccaagacaaaaatatgaaaattttacactgatacttccatttca  
. . . . .  
agataatTTtaagattataaggattttgcttaattcttgaatTTtatacctgtaaacctt  
. . . . .  
ttatacttcaaatttcgggcagaattgcttctataacaatgataattatacctcatacta  
. . . . .  
gcttcttttcttagtactgctccatttggggacctgtatatctatacttcttattctgagt  
. . . . .  
ctctccactatatatatatatatatatatatTTTTTTTTTTTTTTTTTTTaaatacag

|1041 |1051 |1061 |1071 |1081 |1091  
ACTTTGCTACCAGGACTTGCTGGCCCCTCTGGGGAGATGGTTAAATCCACAACAAGTCTG  
T L L P G L A G P S G E M V K S T T S L  
|351 |361

|1101 |1111 |1121 |1131 |1141 |1151  
ACCTCGTCTTCTACTTCTGGAAGTAGTGATAAGGTCTATGCCACCAGATGGTTCGTACA  
T S S S T S G S S D K V Y A H Q M V R T  
|371 |381

|1161 |1171 |1181 |1191 |1201 |1211  
GATTCCCGGGAACAGAAGCTTGATGCATTCTGCAGCCTCTGAGCAAACCCCTGTCCAGT  
D S R E Q K L D A F L Q P L S K P L S S  
|391 |401

|1221 |1231 |1241 |1251 |1261 |1271  
CAGCCCCAGGCCATTGTACAGAGGATAAGACAGATATTTCTAGTGGCAGGGCTAGGCAG  
Q P Q A I V T E D K T D I S S G R A R Q  
|411 |421

|1281 |1291 |1301 |1311 |1321 |1331  
CAAGATGAGGAGATGCTTGAACCTCCAGCCCCTGCTGAAGTGGCTGCCAAAAATCAGAGC  
Q D E E M L E L P A P A E V A A K N Q S  
|431 |441

|1341        |1351        |1361        |1371        |1381        |1391  
 TTGGAGGGGGATACAACAAAGGGGACTTCAGAAATGTCAGAGAAGAGAGGACCTACTTCC  
 L E G D T T K G T S E M S E K R G P T S  
              |451                                |461

|1401  
 AGCAACCCAGgtatggccttttgggaaaagtacagcctacctcctttattctgtaataa  
 S N P R

. . . . .  
 aactgccttctaactttggccttttcatgaatcacttgcatcttctctctgcctgacttgc

. . . . .  
 cctctggaatggtgctggaatggcctgtggccttgtccactgtctgcctttgaccataa

. . . . .  
 cttgaaagtcacccaccatagtgctctttgaaataacttaaatgtccacagtccaagca

. . . . .  
 tgagttaaaaacacttcagaatgtagagtagttgttcaattgaataaacacacacaccag

. . .  
 aaaaaaaagca

Exon 13 | Start: 40435 | End: 40583 | Length: 148

```
. . . . .
agacttcacaaattcagctcacttgctcaaggccctgcagctctacgggatgaagctata

. . . . .
ctccagagtcttgctacattggctgtgtggccagctgctgggatctgagggttgtcagat

. . . . .
aagcagtctaccagagaacagactgatcttgttggccttctgccagcacaggggttcatt

. . . . .
cacagctctgtagaaccagcacagagaagttgcttgctcctccaaatgcaaccacaaa

. . . . .
atttggctaagtttaaaaacaagaataataatgatctgcacttccttttcttcattgcag

|1411      |1421      |1431      |1441      |1451      |1461
AAAGAGACATCGGGAAGATTCTGATGTGGAAATGGTGAAGATGATCCCGAAAGGAAAT
K R H R E D S D V E M V E D D S R K E M
|471                               |481

|1471      |1481      |1491      |1501      |1511      |1521
GACTGCAGCTTGTACCCCCGAGAAGGATCATTAACTCACTAGTGTTTTGAGTCTCCA
T A A C T P R R R I I N L T S V L S L Q
|491                               |501

|1531      |1541      |1551      . . . . .
GGAAGAAATTAATGAGCAGGGACATGAGGgtacgtaaacgctgtggcctgcctgggatgc
E E I N E Q G H E V
|511

. . . . .
atagggcctcaactgccaaggttttggaatggagaaagcagtcatgttgtcagagtggc

. . . . .
cactacagttttgctgggcaagctcctcttcttactaaccacaaatagcatcagctta

. . . . .
aagacaatttttgattgggagaaaaggagaaaaataatctctgtttattttaattagca

. . . . .
ttaattgggtattctgtttaaccataggagtcagagtaaatacagccatttcaccaat
```



. . . . .  
cagtttgtttctgtcttagctaacagcag

Exon 14 | Start: 51837 | End: 51945 | Length: 108

```
. . . . .
tttctctaatgtcttttaataaagttgacctcagagatctcgttacctctctgagttcct

. . . . .
gctttgtcttagattttgatccttgagtgttctttaatcttttagcaattccttggtgca

. . . . .
tgttaaaagattagttatatattttattcctcatttggttcgttttcaccaggaggctcaa

. . . . .
ttcaggcttctttgcttacttgggtgtctctagttctgggtgcctgggtgctttggtcaatga

. . . . .
agtgggggttggtaggattctattacttacctgttttttgggtttatttttgttttgcag

|1561      |1571      |1581      |1591      |1601      |1611
TTCTCCGGGAGATGTTGCATAACCACTCCTTCGTGGGCTGTGTGAATCCTCAGTGGGCCT
  L  R  E  M  L  H  N  H  S  F  V  G  C  V  N  P  Q  W  A  L
|521                                     |531

|1621      |1631      |1641      |1651      |1661      . . .
TGGCACAGCATCAAACCAAGTTATACCTTCTCAACACCACCAAGCTTAGgtaaatcagct
  A  Q  H  Q  T  K  L  Y  L  L  N  T  T  K  L  S
|541                                     |551

. . . . .
gagtgtgtgaacaagcagagctactacaacaatgggtccaggagcacaggcacaaaagct

. . . . .
aaggagagcagcatgaggtagttgggagggcacaggctttggagtcagacacatgtggtt

. . . . .
tcaaatccaagttcgaccatttccatttatttgactgtagacaagttacattcctaaac

. . . . .
tatgtctcagatttctcatctgtaagttgtggtattactagttaacatgcaggggttttg

. . . . .
tttgtttgtttgtttgtttgtgagggtgaagaaataaccaagaag
```

Exon 15 | Start: 53919 | End: 53982 | Length: 63

```
. . . . .
ttttatagcaccagacaggtaggacagaacatgagtggcagcaagccagacttgggtctt

. . . . .
agtgtcttaacctgtctgttagaggctggccagtcagacccctggttgaagacgttggga

. . . . .
atcccagctctttggaggggtaagagattttgttagactgttaaccagattccacagcca

. . . . .
ggcagaactatttctgtctcatccatgtttcagggattacttctcccattttgtcccaac

. . . . .
tggttgtatctcaagcatgaattcagcttttccttaaagtcacttcattttattttcag

      |1671      |1681      |1691      |1701      |1711      |1721
TGAAGAACTGTTCTACCAGATACTCATTATGATTTTGCCAATTTTGGTGTTCAGGTT
E E L F Y Q I L I Y D F A N F G V L R L
      |561                      |571

      |1731.
ATCGgtaagtttagatccttttcacttctgaaatttcaactgatcgtttctgaaaatagt
S

. . . . .
agctctccactaatatcttattttagtatgttaaatttttctaaaacttctaaggatag

. . . . .
ttgctgtattgtatgatttgcataatggaggtatctataagaagttttatacttttttagca

. . . . .
aaatagtcatttggtagccaacttaacaaatgtttattaatatagaagttaataatc

. . . . .
tactgatactcggccgggtgcggtggctcatgcctgtaatcccaccactttgggaggctg

.
aggc
```

Exon 16 | Start: 59170 | End: 59334 | Length: 164

. . . . .  
aatacgaaagttgagtccttaaggctacacagaaagaaagtacctccccagggttcacc

. . . . .  
cttcccatcctttcagcaggctttttgtctgtcgtatcttctctgttgaaatggccattg

. . . . .  
acaagaggaggaaaggggttttgttggtgattgttcaggcacttcctttggggatatatgg

. . . . .  
gggatgagtggttacatttatggtttctcacctgccattctgatagtggttcttggaat

. . . . .  
tcaggcttcatttggatgctccgttaaagcttgctccttcattgttcttgcttcttcctag

          |1741      |1751      |1761      |1771      |1781      |1791  
GAGCCAGCACCGCTCTTTGACCTTGCCATGCTTGCCTTAGATAGTCCAGAGAGTGGCTGG  
E P A P L F D L A M L A L D S P E S G W  
          |581                          |591

          |1801      |1811      |1821      |1831      |1841      |1851  
ACAGAGGAAGATGGTCCCAAAGAAGGACTTGCTGAATACATTGTTGAGTTTCTGAAGAAG  
T E E D G P K E G L A E Y I V E F L K K  
          |601                          |611

          |1861      |1871      |1881      |1891      . . . . .  
AAGGCTGAGATGCTTGCAGACTATTTCTTTGGAAATTGATGAGgtgtgacagccattc  
K A E M L A D Y F S L E I D E  
          |621                          |631

. . . . .  
ttatacttctgttgattcttcaaataaaatttcagccgggtgcggtgggtcatggctg

. . . . .  
taatcccagcactttgggaggctgaggtgggcagataacttggggtcaggagttcaaac

. . . . .  
cagctggccaacatgatgaaacccgtctctactaaaaaatagaaaaattagccaggcg

. . . . .  
tggtggcgggtacctgtaatccaagctgctcaggaggctgaggcagaagaatcacttaa

. . . . .  
cccaagaggtagaagttgcagtgagccgagattgcaccactgcac

Exon 17 | Start: 60168 | End: 60260 | Length: 92  
BE AWARE: Flanking intron is shared with the following exon

```
. . . . .
gattatgccatttgctcccatcttcttattctttcatttttggggctctccatcttga
. . . . .
tgtgttctttggatcgtgaacagatccaaagaaaagggtgttctgccgtgctgtttgtca
. . . . .
ggatgaaaaactctttttaagtgttaggtctgccccagtgcccagcccaatcaagta
. . . . .
acgtggtcaccagagtggcagataggagcacaaggcctgggaaagcactggagaaatgg
. . . . .
gatttgtttaactatgacagcattatttctgttccctgtcctttttcctgcaagcag

      |1901      |1911      |1921      |1931      |1941      |1951
GAAGGGAACCTGATTGGATTACCCCTTCTGATTGACAACTATGTGCCCCCTTTGGAGGGA
E  G  N  L  I  G  L  P  L  L  I  D  N  Y  V  P  P  L  E  G
                        |641                                |651

      |1961      |1971      |1981
CTGCCTATCTTCATTCTTCGACTAGCCACTGAGGgtcagtgatcaagcagataactaagcat
L  P  I  F  I  L  R  L  A  T  E
                        |661

. . . . .
ttcggatcatgcatgtgtgctggagggaagggaatgaccaccctttgatctggaatg
. . . . .
ataaagatgataagggtgggatagctgaaggcctgctctcatccccactaatattcatt
```

Exon 18 | Start: 60555 | End: 60668 | Length: 113  
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . .
ccagcaatattcagcagtcacattttacagttttaacgcctaaagtatcacatttcgtttt

. . . . .
ttagctttaagtagtctgtgatctccgtttagaatgagaatgtttaaattcgtacctatt

. . . . . |1991 |2001 |2011 |2021
ttgaggtattgaatttctttggaccagGTGAATTGGGACGAAGAAAAGGAATGTTTGA
      V N W D E E K E C F E
                        |671

      |2031 |2041 |2051 |2061 |2071 |2081
AGCCTCAGTAAAGAATGCGCTATGTTCTATTCCATCCGGAAGCAGTACATATCTGAGGAG
S L S K E C A M F Y S I R K Q Y I S E E
      |681 |691

      |2091 |2101 . . . . .
TCGACCCTCTCAGGCCAGCAGgtacagtggtagtgacactggcaccccaggactaggac
S T L S G Q Q
      |701

. . . . .
aggacctcatacaatctttaggagatgaaacttgcccatctctaaaatttcgggatttct

. . . . .
ttgtaccaacaagggttcaaacacaacagtcagcttttattcatgatttttacttccatc

. . . . .
tgctgatgtagaacatacctccagagtacactcagaaattgtcaaatgtgaaaacacaag

. . . . .
ccatcacagtgagaaatgggaggttgagttagattgtctaaggctggagagtcacatatac

. . . . .
tcccactgttagctctgaagt

```

Exon 19 | Start: 62137 | End: 62497 | Length: 360

. . . . .  
gaggctgagggtgggaagatggcttaagcccaggagtttgaggctgtagagctatgatcac

. . . . .  
accactgcccttcagcctgggtgacagagcaagaccttgtctctaataaacaacaaac

. . . . .  
aaaaaatcctcttgtgttcaggcctgtgggatcccctgagaggctagcccacaagatcca

. . . . .  
cttcaaaagccctagataacaccaagtctttccagaccagtgacatcccatcagccag

. . . . .  
gacaccagtgatatgttgggatgcaaacaggaggcttatgacatctaattgtgtttccag

2111	2121	2131	2141	2151	2161
AGTGAAGTGCCTGGCTCCATTCCAAACTCCTGGAAGTGGACTGTGGAACACATTGTCTAT					
S E V P G S I P N S W K W T V E H I V Y					
		711			721

2171	2181	2191	2201	2211	2221
AAAGCCTTGCCTCACACATTCTGCCTCCTAAACATTTCACAGAAGATGGAAATATCCTG					
K A L R S H I L P P K H F T E D G N I L					
		731			741

2231	2241	2251	2261	2271	*11
CAGCTTGCTAACCTGCCTGATCTATACAAAGTCTTTGAGAGGTGTTAAATATGGTTATTT					
Q L A N L P D L Y K V F E R C *					
		751			

*21	*31	*41	*51	*61	*71
ATGCACTGTGGGATGTGTTCTTCTTTCTGTATTCCGATACAAAGTGTGTATCAAAGT					

*81	*91	*101	*111	*121	*131
GTGATATACAAAGTGTAACCAACATAAGTGTGGTAGCACTTAAGACTTATACTTGCCTTC					

*141	*151	*161	*171	*181	*191
TGATAGTATTCCTTTATACACAGTGGATTGATTATAAATAAATAGATGTGTCTTAACATA					

. . . . .  
Atttctattttaattttattatgtatatattgtgtcagttcagatgccaaaagaggtct



. . . . .  
tgaacatgtcacaggctctgatggcactgaccatggagaaagcttgatttgatcatctgg  
  
. . . . .  
tgtctacaataaccaaagctaattattaaggaaaaaacttgaagaaagaaaatagtcct  
  
. . . . .  
tacttcatctataatgagggtttttgtttttttgttttgagacggagtccttgctttgttgc  
  
. . . . .  
ccaggccggagtgcagtggcgcgatattggctcactgcaacctccgcttacgggttcaa  
  
.   
g

GBK 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