Gene: EGFR - Sequence: NG_007726.3
Transcript: NM_005228.3 - Protein: NP_005219.2
Date : February 19, 2015

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

```
Exon 1 | Start: 5000 | End: 5334 | Length: 334



.    .    .    .    .    .    .    .    .    .    .    .
ggggaccgggtccagaggggcagtgctgggaacgcccctctcggaaattaactcctcagg

.    .    .    .    .    .    .    .    .    .    .    .
gcacccgctcccctcccatgcgccgccccactcccgccggagactaggtcccgcgggggc

.    .    .    .    .    .    .    .    .    .    .    .
caccgctgtccaccgcctccggcggccgctggccttgggtccccgctgctggttctcctc

.    .    .    .    .    .    .    .    .    .    .    .
cctcctcctcgcattctcctcctcctctgctcctcccgatccctcctccgccgcctggtc

.    .    .    .    .    .    .    .    .    .    .    .
cctcctcctcccgccctgcctccccgcgcctcggcccgcgcgagctagacgtccgggcag

       |-239     |-229     |-219     |-209     |-199     |-189
CCCCGGCGCAGCGCGGCCGCAGCAGCCTCCGCCCCCCGCACGGTGTGAGCGCCCGACGCG

       |-179     |-169     |-159     |-149     |-139     |-129
GCCGAGGCGGCCGGAGTCCCGAGCTAGCCCCGGCGGCCGCCGCCGCCCAGACCGGACGAC

       |-119     |-109     |-99      |-89      |-79      |-69
AGGCCACCTCGTCGGCGTCCGCCCGAGTCCCCGCCTCGCCGCCAACGCCACAACCACCGC

       |-59      |-49      |-39      |-29      |-19      |-9
GCACGGCCCCCTGACTCCGTCCAGTATTGATCGGGAGAGCCGGAGCGAGCTCTTCGGGGA

      |1        |11       |21       |31       |41       |51
GCAGCGATGCGACCCTCCGGGACGGCCGGGGCAGCGCTCCTGGCGCTGCTGGCTGCGCTC
      M  R  P  S  G  T  A  G  A  A  L  L  A  L  L  A  A  L
      |1                           |11
```

```
      |61       |71       |81         .    .    .    .    .
TGCCCGGCGAGTCGGGCTCTGGAGGAAAAGAAAGgtaagggcgtgtctcgccggctcccg
C  P  A  S  R  A  L  E  E  K  K  V
      |21

   .    .    .    .    .    .    .    .    .    .    .    .
cgccgcccccggatcgcgccccggaccccgcagcccgcccaaccgcgcaccggcgcaccg

   .    .    .    .    .    .    .    .    .    .    .    .
gctcggcgcccgcgcccccgcccgtcctttcctgtttccttgagatcagctgcgccgccg

   .    .    .    .    .    .    .    .    .    .    .    .
accgggaccgcgggaggaacgggacgtttcgttcttcggccgggagagtctggggcgggc

   .    .    .    .    .    .    .    .    .    .    .    .
ggaggaggagacgcgtgggacaccgggctgcaggccaggcggggaacggccgccgggacc

   .    .    .    .    .    .    .
tccggcgccccgaaccgctcccaactttcttccc
```

Exon 2 | Start: 128254 | End: 128406 | Length: 152

```
.    .    .    .    .    .    .    .    .    .    .    .
aattcaatgcattatagggacaagctatctcttattatgaattgcaccttatataaactt

.    .    .    .    .    .    .    .    .    .    .    .
aaagatcttttatcacaaatttctttgctgtgtcctttagtgagaatttgtattatcagt

.    .    .    .    .    .    .    .    .    .    .    .
cactaaagctcactaagttagtaagctttgcgcccagatgacctgggcaggaatgggtga

.    .    .    .    .    .    .    .    .    .    .    .
gtctctgtgtggagagagtgaagaaactgctacccttaatacctggaccttgagggattg

.    .    .    .    .    .    .    .    .    .    .    .
ttttattttagtttttctgcatttctcagtatttcatgtgatatctgtctttttcttcca

  |91       |101      |111      |121      |131      |141
TTTGCCAAGGCACGAGTAACAAGCTCACGCAGTTGGGCACTTTTGAAGATCATTTTCTCA
  C  Q  G  T  S  N  K  L  T  Q  L  G  T  F  E  D  H  F  L  S
  |31                          |41
```

```
  |151      |161      |171      |181      |191      |201
GCCTCCAGAGGATGTTCAATAACTGTGAGGTGGTCCTTGGGAATTTGGAAATTACCTATG
  L  Q  R  M  F  N  N  C  E  V  V  L  G  N  L  E  I  T  Y  V
  |51                          |61

  |211      |221      |231          .    .    .    .    .
TGCAGAGGAATTATGATCTTTCCTTCTTAAAGgttggtgactttgattttcctacacaaa
  Q  R  N  Y  D  L  S  F  L  K
  |71

 .    .    .    .    .    .    .    .    .    .    .    .
taaaattggagaaaatctaagtggagaaaggcctgggcagaattccacttgaagtgtgtt

 .    .    .    .    .    .    .    .    .    .    .    .
tatttttgctatggcaatgacaagtcttacagagctacaaacgagagttttatgagaaag

 .    .    .    .    .    .    .    .    .    .    .    .
ccattttaccagctaatgtcaagtaataactagaaaaggatatcaaatagaaacaggcta

 .    .    .    .    .    .    .    .    .    .    .    .
atctggagttccatgtcatcatagacactgacgtttatccctgaccattacctcagtcat

 .    .    .    .    .    .    .
gatgtgctgccatactcgctcttaaaaacttt


Exon 3 | Start: 129273 | End: 129457 | Length: 184


.    .    .    .    .    .    .    .    .    .    .    .
taatttccattttcactggagagtgttgaaccccgtgaggcatgagagcacagtgttcca

.    .    .    .    .    .    .    .    .    .    .    .
gaacaatgcttactgctcattatcacaggggtcaaaggctaacgtgcagggattgttgca

.    .    .    .    .    .    .    .    .    .    .    .
gatcgtggacatgctgcctcctgtgtccatgactgcaatcgtctacctattttacagttg

.    .    .    .    .    .    .    .    .    .    .    .
ttgagcactcgtgtgcattagggttcaactgggcgtcctagggctccctggacccatttt

.    .    .    .    .    .    .    .    .    .    .    .
agaccttgagttcttgagttcctcaaaagagaaatcacgcatttatgttttctcttctta
```

```
|241      |251      |261      |271      |281      |291
ACCATCCAGGAGGTGGCTGGTTATGTCCTCATTGCCCTCAACACAGTGGAGCGAATTCCT
T  I  Q  E  V  A  G  Y  V  L  I  A  L  N  T  V  E  R  I  P
|81                          |91

|301      |311      |321      |331      |341      |351
TTGGAAAACCTGCAGATCATCAGAGGAAATATGTACTACGAAAATTCCTATGCCTTAGCA
L  E  N  L  Q  I  I  R  G  N  M  Y  Y  E  N  S  Y  A  L  A
|101                         |111

|361      |371      |381      |391      |401      |411
GTCTTATCTAACTATGATGCAAATAAAACCGGACTGAAGGAGCTGCCCATGAGAAATTTA
V  L  S  N  Y  D  A  N  K  T  G  L  K  E  L  P  M  R  N  L
|121                         |131

|421    .    .    .    .    .    .    .    .    .    .
CAGGgtgagaggctgggatgccaaggctgggggttcataaatgcagacagcagttccgat
Q  E
|141

   .    .    .    .    .    .    .    .    .    .    .
ggctcccagcgagcttgtcactcaattccacctcggagaaggcttttatttttacccagt

   .    .    .    .    .    .    .    .    .    .    .
acacgtgcactgagtgccggctgtgtgtaagatactgcaggggaagttactgagaagatg

   .    .    .    .    .    .    .    .    .    .    .
gcagatactggaatgggaagatttaagcggggtaccagtgtttacatggacatgaaaaaa

   .    .    .    .    .    .    .    .    .    .    .
tactgagagatagtaagaaatcgtaaagattctgagtaaaagagagtatgaccaaacaag

   .
ctga
```

Exon 4 | Start: 132574 | End: 132709 | Length: 135

```
.    .    .    .    .    .    .    .    .    .    .    .
cacatgcatatcatttatgctgtgaccactgactaaaccattctcttccttcctccccat

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

```
atttctaaatttctaatcattgctcaaagcccaattcagagaaaaccctagctcctccat

.    .    .    .    .    .    .    .    .    .    .    .
ggcaccatcattaacaattttatctggccgccccccgggaagttcactgggctaattgcg

.    .    .    .    .    .    .    .    .    .    .    .
ggactcttgttcgcaccatggcatctctttagcagaacataaatgcgaagagcacatgca

.    .    .    .    .    .    .    .    .    .    .    .
tccttcatgggaatttaaaggagctggaaagagtgctcaccgcagttccattctcccgca

      |431      |441      |451      |461      |471      |481
AAATCCTGCATGGCGCCGTGCGGTTCAGCAACAACCCTGCCCTGTGCAACGTGGAGAGCA
  I  L  H  G  A  V  R  F  S  N  N  P  A  L  C  N  V  E  S  I
                         |151                         |161

      |491      |501      |511      |521      |531      |541
TCCAGTGGCGGGACATAGTCAGCAGTGACTTTCTCAGCAACATGTCGATGGACTTCCAGA
  Q  W  R  D  I  V  S  S  D  F  L  S  N  M  S  M  D  F  Q  N
                         |171                         |181

      |551        .    .    .    .    .    .    .    .
ACCACCTGGGCAGCTgtaagtgtcgcatacacactatctctgcctccagctcctatgggg
  H  L  G  S  C

    .    .    .    .    .    .    .    .    .    .    .    .
gacagctctacagcactggggcaggggagagaagccatgtttagtaagtcacattaatca

    .    .    .    .    .    .    .    .    .    .    .    .
gaaacaaaaagtagtaagcaaaatatctgaccactagaaaagcatgtatttaccacggac

    .    .    .    .    .    .    .    .    .    .    .    .
atagagatcgttttttttgtggcgggtggcagcccagctggttggcagtgcaggccaccgg

    .    .    .    .    .    .    .    .    .    .    .    .
aggcagatcccctgcagggacagcagagcacttgtgtcctgagaagagctgctgttcatg

    .    .    .
gggctggcagcacca
```

Exon 5 | Start: 137262 | End: 137331 | Length: 69

```
.    .    .    .    .    .    .    .    .    .    .    .
aagcagattgtaaacaaggaacctcaaattcatgaaaaattcttgcttatgtggcccatg

.    .    .    .    .    .    .    .    .    .    .    .
tcagtaattactctctgcctcagtttccgcagctgacatgtaaataaaagcagttcatgg

.    .    .    .    .    .    .    .    .    .    .    .
ttcatcttctttttcttatcggggtctcaagtgattctacaaaccagccagccaaacaatc

.    .    .    .    .    .    .    .    .    .    .    .
agagaataagttgaaaagattgtcttcatttattgaatgtgcttaactcaggcccgggaa

.    .    .    .    .    .    .    .    .    .    .    .
agggcgtcatcagtttctcatcatttcactgagatatgcatctattacttttacatttca

 |561      |571      |581      |591      |601      |611
GCCAAAAGTGTGATCCAAGCTGTCCCAATGGGAGCTGCTGGGGTGCAGGAGAGGAGAACT
  Q  K  C  D  P  S  C  P  N  G  S  C  W  G  A  G  E  E  N  C
           |191                          |201

 |621       .    .    .    .    .    .    .    .    .    .
GCCAGAAACgtaagtcagtgaacagcctcagacccatgtgtgaccgcccctctcttcctt
  Q  K  L


   .    .    .    .    .    .    .    .    .    .    .    .
cacttgcttaggtgattggatttgttttccctctgaagactccaaagagttactttatta

   .    .    .    .    .    .    .    .    .    .    .    .
cagggtcagatgtgaaccagtaggtgaaggacagtcttgcaaatctcaccgcatgcagtt

   .    .    .    .    .    .    .    .    .    .    .    .
aatccagggtgggctattttgggagcttcagcctatcacaaataagtgaacatcagcagg

   .    .    .    .    .    .    .    .    .    .    .    .
ggctgggcgcggtggctcacccctataatcccagcactttgggaggcggaggcggtcgga

   .    .
tcacgaggt
```

Exon 6 | Start: 138514 | End: 138633 | Length: 119

```
.    .    .    .    .    .    .    .    .    .    .    .
ccagcaggtatttttgttctttgtatgtgctttctgcattgcccaagatgcatctaatta

.    .    .    .    .    .    .    .    .    .    .    .
tttagcaggtctcaaagtctagacttgatctcatgagttctcttaagtgattaaaaataa

.    .    .    .    .    .    .    .    .    .    .    .
atcaggagaaaaaagaggcaatcagaaaagggcatggtttgacttagtttgaatgtggtt

.    .    .    .    .    .    .    .    .    .    .    .
tcgttggaagcaaatgtgtcttcacttttcatgaaaaagtctgcaagtgctctgcgaca

.    .    .    .    .    .    .    .    .    .    .    .
tccctgggaaatgatcctaccctcactcttcagctcacagggaacctttgctcttttca

  |631      |641      |651      |661      |671      |681
TGACCAAAATCATCTGTGCCCAGCAGTGCTCCGGGCGCTGCCGTGGCAAGTCCCCCAGTG
  T  K  I  I  C  A  Q  Q  C  S  G  R  C  R  G  K  S  P  S  D
  |211                        |221

  |691      |701      |711      |721      |731      |741
ACTGCTGCCACAACCAGTGTGCTGCAGGCTGCACAGGCCCCCGGGAGAGCGACTGCCTGg
  C  C  H  N  Q  C  A  A  G  C  T  G  P  R  E  S  D  C  L
  |231                        |241

   .    .    .    .    .    .    .    .    .    .    .    .
taagatgcccctccagcagcctccctggagcaggctggggctgcacccgccccacccaca

   .    .    .    .    .    .    .    .    .    .    .    .
ccaggacagaagacttcctgtgggggagctgtcaattagcatttgtcataacagacagga

   .    .    .    .    .    .    .    .    .    .    .    .
tattgccctctgcctggtgacaaagtatctttagtatcctgcctccaccactcactgaga

   .    .    .    .    .    .    .    .    .    .    .    .
ccttgggaaaatgatgggactaccatgcctccatttccttacctgacaatgatgcataac

   .    .    .    .    .    .    .    .    .    .    .    .
aaagtctctcccagttgaatgcttaaatgatgagatgcctgtgatgtccgtcattagga
```

Exon 7 | Start: 139979 | End: 140121 | Length: 142

```
.    .    .    .    .    .    .    .    .    .    .    .
tcaccgctataatgtgtgaactccatcatctatacgttagtaaacagacgtatttttatc

.    .    .    .    .    .    .    .    .    .    .    .
ataatccataaattatgataggtgggacagtgcacctaagaaaaaaatggacttttaga

.    .    .    .    .    .    .    .    .    .    .    .
gaagggtctttctgactctgcagagggcgccagctgggttttcccacactagtggaacac

.    .    .    .    .    .    .    .    .    .    .    .
taggctgcaaagacagtaacttgggctttctgacgggagtcaacaccgtgctgcgcttcc

.    .    .    .    .    .    .    .    .    .    .    .
tccgtgtgtggcgctgagtgtacttacctcacttgcccagcgtgtcctctctcctccata

   |751      |761      |771      |781      |791      |801
GTCTGCCGCAAATTCCGAGACGAAGCCACGTGCAAGGACACCTGCCCCCCACTCATGCTC
V  C  R  K  F  R  D  E  A  T  C  K  D  T  C  P  P  L  M  L
   |251                        |261

   |811      |821      |831      |841      |851      |861
TACAACCCCACCACGTACCAGATGGATGTGAACCCCGAGGGCAAATACAGCTTTGGTGCC
Y  N  P  T  T  Y  Q  M  D  V  N  P  E  G  K  Y  S  F  G  A
   |271                        |281

   |871      |881        .    .    .    .    .    .    .
ACCTGCGTGAAGAAGTGTCCCCgtgagtcctcctctgtgggccctctaactggtcaggca
T  C  V  K  K  C  P  R
   |291

 .    .    .    .    .    .    .    .    .    .    .    .
tccttgtcccgctctgtctcctgctgagccctggagtatcccatcttggagagtctttgg

 .    .    .    .    .    .    .    .    .    .    .    .
gtggatgtgtttgccttgcttggaggaggcgaccctgtgcccgtccaggcacacaggcga

 .    .    .    .    .    .    .    .    .    .    .    .
ggggaggggctggcttgctaccgaggagcgggcaggtggtggccatctccacccatgggg

 .    .    .    .    .    .    .    .    .    .    .    .
gctgctcagtgcacagggcagatctgggtggccaggccacctcacaggagaaacacctgc

 .    .    .    .    .
tgctcagccctcaccactcatc
```

Exon 8 | Start: 141798 | End: 141915 | Length: 117

```
.    .    .    .    .    .    .    .    .    .    .    .
caggtggaggagagggctgaggtgcctgctgggacgcaaaacagctggcccctcaaggga

.    .    .    .    .    .    .    .    .    .    .    .
cccagtgtttcctgccatgatgaaacacctgtattgtccacattgcggcctagaatgtta

.    .    .    .    .    .    .    .    .    .    .    .
ttaaactcttgaacgggattccttctctatttgcaacctttcattctttgtccttaaagt

.    .    .    .    .    .    .    .    .    .    .    .
aaataaagccaaaggaggatggagcctttccatcacccctcaagaggacctggaccgcct

.    .    .    .    .    .    .    .    .    .    .    .
gtgtgaggcccgagcacctggtgccaccgtcatcaccttcctttcatgctctcttcccca

 |891      |901      |911      |921      |931      |941
GTAATTATGTGGTGACAGATCACGGCTCGTGCGTCCGAGCCTGTGGGGCCGACAGCTATG
  N   Y   V   V   T   D   H   G   S   C   V   R   A   C   G   A   D   S   Y   E
          |301                          |311

 |951      |961      |971      |981      |991      |1001
AGATGGAGGAAGACGGCGTCCGCAAGTGTAAGAAGTGCGAAGGGCCTTGCCGCAAAGgta
  M   E   E   D   G   V   R   K   C   K   K   C   E   G   P   C   R   K   V
          |321                          |331

 .    .    .    .    .    .    .    .    .    .    .    .
ggaagcccgccggtgtgcggacgaggcttgttctcggctgctgaggctgggctctcatgc

 .    .    .    .    .    .    .    .    .    .    .    .
cacctccaaaggaacacatcttcctcttctcattaaaaaacaactatacatatcgtttct

 .    .    .    .    .    .    .    .    .    .    .    .
ttaaaacagaagataaagctgtaaagctaggttaggcaatgggaaggcactgaaggttgt

 .    .    .    .    .    .    .    .    .    .    .    .
gacggggtgggggctctgatgagaacagtcacagagccagccccgctcagcagctgcca

 .    .    .    .    .    .    .    .    .    .    .    .
ggtgcccagccctggggagaatccagggaaggcagagctggaagcagtgcagctcca
```

```
Exon 9 | Start: 142501 | End: 142628 | Length: 127
BE AWARE: This section overlaps with the following exon



.    .    .    .    .    .    .    .    .    .    .    .
agcagtgcagctccaagcggcccatgggaaataatgaggagaacgcaaggtcagtgtgag

.    .    .    .    .    .    .    .    .    .    .    .
gtgacagggatggcatctcctacaccgccgtagccccaaagtgtactataggtcctggtg

.    .    .    .    .    .    .    .    .    .    .    .
tccccccttcccgcctgcactctccccagccccttcagtgtttgttgagtgaatgaagga

.    .    .    .    .    .    .    .    .    .    .    .
tgatgtggcagtggcggttccggtgaccggaattccttcctgcttccctctgcctgtgga

.    .    .    .    .    .    .    .    .    .    .    .
tccctagctattcttaatccaacaaatgtgaacggaatacacgtctctcttatctctgca

    |1011     |1021     |1031     |1041     |1051     |1061
TGTGTAACGGAATAGGTATTGGTGAATTTAAAGACTCACTCTCCATAAATGCTACGAATA
  C  N  G  I  G  I  G  E  F  K  D  S  L  S  I  N  A  T  N  I
             |341                          |351

    |1071     |1081     |1091     |1101     |1111     |1121
TTAAACACTTCAAAAACTGCACCTCCATCAGTGGCGATCTCCACATCCTGCCGGTGGCAT
  K  H  F  K  N  C  T  S  I  S  G  D  L  H  I  L  P  V  A  F
             |361                          |371

    |1131  .    .    .    .    .    .    .    .    .    .
TTAGGGGgtgagtcacaggttcagttgcttgtataaagaaaaacaaaatctgccttttta
  R  G


 .    .    .    .    .    .    .    .    .
actggtagagattggtgatcaataatcaccctgttgtttgtttca



Exon 10 | Start: 142727 | End: 142801 | Length: 74
BE AWARE: This section overlaps with the previous exon
```

```
.    .    .    .    .    .    .    .    .    .    .    .
tgagtcacaggttcagttgcttgtataaagaaaaacaaaatctgccttttttaactggtag

.    .    .    .    .    .    .    .         |1141     |1151
agattggtgatcaataatcaccctgttgtttgtttcaTGACTCCTTCACACATACTCCTC
                                       D  S  F  T  H  T  P  P
                                             |381

    |1161     |1171     |1181     |1191     |1201      .
CTCTGGATCCACAGGAACTGGATATTCTGAAAACCGTAAAGGAAATCACAGgtttgagct
  L  D  P  Q  E  L  D  I  L  K  T  V  K  E  I  T  G
              |391                          |401

.    .    .    .    .    .    .    .    .    .    .    .
gaattatcacatgaatataaatgggaaatcagtgttttagagagagaacttttcgacata

.    .    .    .    .    .    .    .    .    .    .    .
tttcctgttcccttggaataaaaacatttcttctgaaattttaccgttaatggctgatgt

.    .    .    .    .    .    .    .    .    .    .    .
tttgatatttttcaaaagtgcagtttctcctgcaggcaaaaggggacacgttaagtccag

.    .    .    .    .    .    .    .    .    .    .    .
gcttgggtcattcactgcggtgtaaacacgctttctccctcccgcccggccccagccagc

.    .    .    .    .    .    .    .    .    .    .
tgccttggtggcccataacccctgagggtagagggaggggacaggggtagg
```

Exon 11 | Start: 143631 | End: 143722 | Length: 91

```
.    .    .    .    .    .    .    .    .    .    .    .
ggagcctcttcggggtaatcagatacgcggcgcagcaggggtctcagggccacagccagg

.    .    .    .    .    .    .    .    .    .    .    .
ggggcggcgggagacatgcggaatcgcagcggaaggcgggaggcagctgtgaactgtggc

.    .    .    .    .    .    .    .    .    .    .    .
tcggcctgcgtccgccctgcgcatgtacactcagagaagatgataatgaaaaagaaagca

.    .    .    .    .    .    .    .    .    .    .    .
aatccaattttcccacttactgttcatataatacagagtccctgagagtctagagtaatg
```

```
.    .    .    .    .    .    .    .    .    .    .    .
tctcatacaaaaaagaaactcctacgtggtgtgtgtctgaagtctttcatctgccttaca

   |1211     |1221     |1231     |1241     |1251     |1261
GGTTTTTGCTGATTCAGGCTTGGCCTGAAAACAGGACGGACCTCCATGCCTTTGAGAACC
  F  L  L  I  Q  A  W  P  E  N  R  T  D  L  H  A  F  E  N  L
                      |411                          |421

   |1271     |1281     |1291       .    .    .    .    .
TAGAAATCATACGCGGCAGGACCAAGCAACAgtaagttgaccacagccaaagcctggtag
  E  I  I  R  G  R  T  K  Q  H
                      |431

.    .    .    .    .    .    .    .    .    .    .    .
attacatttgccttttagttggaaattaggcttaacaggagagttgctaagatagggca

.    .    .    .    .    .    .    .    .    .    .    .
cagagctcctgcatctctcgccggcattcccaaatgctatctcacatgagcaggcacagg

.    .    .    .    .    .    .    .    .    .    .    .
gagcaagactgcacgaccactggcacaggctgtccgctaaaccacagacttctcagcgct

.    .    .    .    .    .    .    .    .    .    .    .
cgccagtgcttctgcttctgtgtccactccagatcccacattgcacttagttgtcaaatc

.    .    .    .    .    .    .
ttttcagtccatttctaacctatattagctc
```

Exon 12 | Start: 146107 | End: 146307 | Length: 200

```
.    .    .    .    .    .    .    .    .    .    .    .
tctcaatttccaggcaaaatgaaaatggagaaaatataatgacattaaggcattttattc

.    .    .    .    .    .    .    .    .    .    .    .
atcctccccatctgccactgggttaaagatactaaataaacaaggaactatcttttgcct

.    .    .    .    .    .    .    .    .    .    .    .
ggaggaactttaaaaacacctgcagttttcaaaaggtgcagtgtgtgcctcccacagcat

.    .    .    .    .    .    .    .    .    .    .    .
gacctaccatcattggaaagcagtttgtagtcaatcaaaggtggtctggagaaacaaagt
```

```
.    .    .    .    .    .    .    .    .    .    .    .
tttcagggatacattgtttttataatttttcaccacatgatttttcttctctccaatgta

  |1301     |1311     |1321     |1331     |1341     |1351
TGGTCAGTTTTCTCTTGCAGTCGTCAGCCTGAACATAACATCCTTGGGATTACGCTCCCT
 G  Q  F  S  L  A  V  V  S  L  N  I  T  S  L  G  L  R  S  L
                     |441                          |451

  |1361     |1371     |1381     |1391     |1401     |1411
CAAGGAGATAAGTGATGGAGATGTGATAATTTCAGGAAACAAAAATTTGTGCTATGCAAA
 K  E  I  S  D  G  D  V  I  I  S  G  N  K  N  L  C  Y  A  N
                     |461                          |471

  |1421     |1431     |1441     |1451     |1461     |1471
TACAATAAACTGGAAAAAACTGTTTGGGACCTCCGGTCAGAAAACCAAAATTATAAGCAA
 T  I  N  W  K  K  L  F  G  T  S  G  Q  K  T  K  I  I  S  N
                     |481                          |491

  |1481     |1491      .    .    .    .    .    .    .    .
CAGAGGTGAAAACAGCTGCAgtaagtcaccgctttctgtttagtttatggagttggttct
 R  G  E  N  S  C  K

    .    .    .    .    .    .    .    .    .    .    .    .
aatgggtcctttatttgtatttagaatattgaagggctattcccatttaaattacttttt

    .    .    .    .    .    .    .    .    .    .    .    .
tcagttccttaagaagcaaattaaaatcttaagattcctaactgtgaaattaccatgtga

    .    .    .    .    .    .    .    .    .    .    .    .
attccattaaaacttttccagatcattaccattcaatgggatgaatttaccctgaggtt

    .    .    .    .    .    .    .    .    .    .    .    .
taggctaccaattatttgtaatgtaagtaactaaatttagtattagttatattacctttt

    .    .    .    .
agttgtaggtcactctctgc


Exon 13 | Start: 147467 | End: 147600 | Length: 133


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

```
gaggactcacggcacccccctctcgggtgccagggtgcctggctcccaccaggaggaagac

.    .    .    .    .    .    .    .    .    .    .    .
ctgtcctccactgtcaggcacatttcagtcttcccagcagccagcacaactactttgtcc

.    .    .    .    .    .    .    .    .    .    .    .
ttccagtcacggtcggcctctgggaagcccagtctgtgtcctcctccttcaggggtagcc

.    .    .    .    .    .    .    .    .    .    .    .
agcatgtctgtgtcacccaaggtcatggagcacagggcccctcccgggaaggtgccgtct

.    .    .    .    .    .    .    .    .    .    .    .
cctccggcccctcgggtccctgctctgtcactgactgctgtgacccactctgtctccgca

  |1501     |1511     |1521     |1531     |1541     |1551
AGGCCACAGGCCAGGTCTGCCATGCCTTGTGCTCCCCCGAGGGCTGCTGGGGCCCGGAGC
  A  T  G  Q  V  C  H  A  L  C  S  P  E  G  C  W  G  P  E  P
  |501                        |511

  |1561     |1571     |1581     |1591     |1601     |1611
CCAGGGACTGCGTCTCTTGCCGGAATGTCAGCCGAGGCAGGGAATGCGTGGACAAGTGCA
  R  D  C  V  S  C  R  N  V  S  R  G  R  E  C  V  D  K  C  N
  |521                        |531

  |1621     |1631.    .    .    .    .    .    .    .
ACCTTCTGGAGGGgtaggaggttatttctttaatccccttgcgttgatcaaaaataaggc
  L  L  E  G
  |541

  .    .    .    .    .    .    .    .    .    .    .    .
tccaggttgttgttatagctttacaggcattctgtttgattttctcttccttttattctt

  .    .    .    .    .    .    .    .    .    .    .    .
tgcccttggcttttggaggttttgggttttctgtggggagacgggaagttgtttgattgc

  .    .    .    .    .    .    .    .    .    .    .    .
gttatttttggcaaatttaagcacaataggaaataagcaagtattattgcctaatataat

  .    .    .    .    .    .    .    .    .    .    .    .
ccaataatttatagaatctctttcctggaagtatcttaaatttttctaagctacaaaaa

  .    .    .
gttcctaagacaa
```

Exon 14 | Start: 149701 | End: 149792 | Length: 91

```
.    .    .    .    .    .    .    .    .    .    .    .
gaacacctcctcaggactatcttttcttttatcatttggcttgcttacccaatatgcaaa

.    .    .    .    .    .    .    .    .    .    .    .
aactatgctgtagaaaaagcagaaaagatatcttgattatgaatgaagctcctgtgttta

.    .    .    .    .    .    .    .    .    .    .    .
ctcagagagaagatgacccaggattcagttaacaaaatcagctgattatattactatata

.    .    .    .    .    .    .    .    .    .    .    .
gtcctggagtcccaactccttgaccattacctcaagttatttggaattttgaagaggtga

.    .    .    .    .    .    .    .    .    .    .    .
tttgtgttcctgcaataatgtctcaggggtgggctgacgggtttcctcttcctcctca

         |1641     |1651     |1661     |1671     |1681     |1691
TGAGCCAAGGGAGTTTGTGGAGAACTCTGAGTGCATACAGTGCCACCCAGAGTGCCTGCC
 E  P  R  E  F  V  E  N  S  E  C  I  Q  C  H  P  E  C  L  P
                   |551                          |561

         |1701     |1711     |1721 .    .    .    .    .
TCAGGCCATGAACATCACCTGCACAGGACGGgtaagagccccttgctgctatccacgtcc
 Q  A  M  N  I  T  C  T  G  R
                   |571

.    .    .    .    .    .    .    .    .    .    .    .
atttcatgggaagggccttcacagaagccgaacagtgatgatggcccagggcatcctgtg

.    .    .    .    .    .    .    .    .    .    .    .
tgggcaggacggccatcagagccacttcccagaggagacggcaggcgctgacagcgctgt

.    .    .    .    .    .    .    .    .    .    .    .
ccgggcagggtgtcggtgacattagcacacacattagcctgcgatgaacattcactcttt

.    .    .    .    .    .    .    .    .    .    .    .
ctgctgacacccccaaccttatctaagcttatcaaatcctcacatttaacggaggctgtt

.    .    .    .    .    .    .
ttcacctggtttcccccatccctgacctagt
```

Exon 15 | Start: 151248 | End: 151406 | Length: 158

```
.    .    .    .    .    .    .    .    .    .    .    .
ggttttgccaaggaaagatgcccacaatggttaagcagaatgcaataatgtagagaatat

.    .    .    .    .    .    .    .    .    .    .    .
catttctttcatgctggtgtatatcatatgcattcaaaaacagggagaacttctaagcaa

.    .    .    .    .    .    .    .    .    .    .    .
ctaacagtgaccatatcaagcaggtgcaatcacagaataactggttttctcctttaagaa

.    .    .    .    .    .    .    .    .    .    .    .
tttttctatcatttggctttccccactcacacacactaaatattttaagtaaaaagttac

.    .    .    .    .    .    .    .    .    .    .    .
ttccattttgaaagagaaaagaaagagacatgcatgaacatttttctccaccttggtgca

        |1731     |1741     |1751     |1761     |1771     |1781
GGACCAGACAACTGTATCCAGTGTGCCCACTACATTGACGGCCCCCACTGCGTCAAGACC
G  P  D  N  C  I  Q  C  A  H  Y  I  D  G  P  H  C  V  K  T
                  |581                          |591

        |1791     |1801     |1811     |1821     |1831     |1841
TGCCCGGCAGGAGTCATGGGAGAAAACAACACCCTGGTCTGGAAGTACGCAGACGCCGGC
C  P  A  G  V  M  G  E  N  N  T  L  V  W  K  Y  A  D  A  G
                  |601                          |611

        |1851     |1861     |1871         .    .    .    .
CATGTGTGCCACCTGTGCCATCCAAACTGCACCTACGGgtgagtggaaagtgaaggagaa
H  V  C  H  L  C  H  P  N  C  T  Y  G
                  |621

  .    .    .    .    .    .    .    .    .    .    .    .
cagaacatttcctctcttgcaaattcagagatcaaaaatgtctcccaagttttccggcaa

  .    .    .    .    .    .    .    .    .    .    .    .
caaattgccgaggtttgtatttgagtcagttacttaaggtgttttggtccccacagccat

  .    .    .    .    .    .    .    .    .    .    .    .
gccagtagcaacttgcttgtgagcaggcctcagtgcagtgggaatgactctgccatgcac

  .    .    .    .    .    .    .    .    .    .    .    .
cgtgtccccggccgggcctgtgttgtgcaatgctgcacatcacaacaggagggtaggggg
```

```
   .    .    .    .    .    .    .    .
acaaaagagcacaggtcctggcagctgccacagtctcc
```

Exon 16 | Start: 157143 | End: 157182 | Length: 39

```
.    .    .    .    .    .    .    .    .    .    .    .
caattatctgtgtcaaaagccagatgtgaaaacatctcaataacaaactggctgctttgt

.    .    .    .    .    .    .    .    .    .    .    .
tcaatgctagaacaacgcctgtcacagagtagaaactcaaaaatatttgctgagtgaatg

.    .    .    .    .    .    .    .    .    .    .    .
aacaaatgaataaatgcataataaataattaaccaccaatccaacatccagacacatagt

.    .    .    .    .    .    .    .    .    .    .    .
gattttaattatttaagagtagtttagcatatattgctttatgatttaattaaaaatctc

.    .    .    .    .    .    .    .    .    .    .    .
caaaatatatgccaaagaagtagaatgagaaaaatgtatatttctctttcacttcctaca

|1881     |1891     |1901     |1911        .    .    .    .
ATGCACTGGGCCAGGTCTTGAAGGCTGTCCAACGAATGGgtaagtgttcacagctctgtg
 C  T  G  P  G  L  E  G  C  P  T  N  G
          |631

   .    .    .    .    .    .    .    .    .    .    .    .
tcacatggacctcgtcaagaatgaccacactgctgtgggtgaagatgctttcctgcattt

   .    .    .    .    .    .    .    .    .    .    .    .
ctgactgtcctctgtcctgatcaagtttctatggctctgggccagcctaccctcagccag

   .    .    .    .    .    .    .    .    .    .    .    .
ggtttctgcagagactgcccagctggttccacgtggctccacgtgccaactttgtcctca

   .    .    .    .    .    .    .    .    .    .    .    .
gtggagggaaagttggacacacagtgctggggctgctccctgctccgccgttgctcgatg

   .    .    .    .    .    .    .    .
catggcctgcctctgaattccttggttccactggttttg
```

Exon 17 | Start: 158951 | End: 159093 | Length: 142

```
.    .    .    .    .    .    .    .    .    .    .    .
atcatattttgttaatcaacaaattgaaaaatactcattatatggagaggtccagataaa

.    .    .    .    .    .    .    .    .    .    .    .
gcctcaattttaaaaaatgaggaaaagtgtgcctggtaggggactggggagagcttgaga

.    .    .    .    .    .    .    .    .    .    .    .
aagttggaaacgttgccttagaagcctgtttttttctcctttagaagctacatagtgtct

.    .    .    .    .    .    .    .    .    .    .    .
cactttccaagatcattctacaagatgtcagtgcactgaaacatgcaggggcgtgttgag

.    .    .    .    .    .    .    .    .    .    .    .
tgccaaggccatggaatctgtcagcaacctcacccttccttgttcctccacctcattcca

 |1921     |1931     |1941     |1951     |1961     |1971
GCCTAAGATCCCGTCCATCGCCACTGGGATGGTGGGGGCCCTCCTCTTGCTGCTGGTGGT
 P  K  I  P  S  I  A  T  G  M  V  G  A  L  L  L  L  L  V  V
 |641                        |651

 |1981     |1991     |2001     |2011     |2021     |2031
GGCCCTGGGGATCGGCCTCTTCATGCGAAGGCGCCACATCGTTCGGAAGCGCACGCTGCG
 A  L  G  I  G  L  F  M  R  R  R  H  I  V  R  K  R  T  L  R
 |661                        |671

 |2041     |2051     |2061.    .    .    .    .    .    .
GAGGCTGCTGCAGGAGAGGGAGgtgagtgccagtcctgggtgggctcaggagccctcgca
 R  L  L  Q  E  R  E
 |681

 .    .    .    .    .    .    .    .    .    .    .    .
ccccgacaggaacaagggccagccccgagaacgggccattagcagttgtgtatgttagat

 .    .    .    .    .    .    .    .    .    .    .    .
acataattgtattatgatgcagaaagaatctctgaatgtgcagttatacccagttggtga

 .    .    .    .    .    .    .    .    .    .    .    .
catgttggtacatccatccgaggaaatggcaatgtttctaggctgcacccttcaatgtcc

 .    .    .    .    .    .    .    .    .    .    .    .
acaaagctgtgtggcatctgcttaggacccggtgcctgtgtgtgcataggagggaggcca
```

```
 .    .    .    .    .
ggaagcctggctgttgatccca
```

Exon 18 | Start: 159889 | End: 160012 | Length: 123

```
.    .    .    .    .    .    .    .    .    .    .    .
tccctaccggagttttcaatccagttaataggcgtggaaacagacatagaaattgtgttt

.    .    .    .    .    .    .    .    .    .    .    .
gttgaaaggtagctgttcagttaaagaacacctgtatcagagcctgtgtttctaccaact

.    .    .    .    .    .    .    .    .    .    .    .
tctgtcaagctctgtagagaaggcgtacatttgtccttccaaatgagctggcaagtgccg

.    .    .    .    .    .    .    .    .    .    .    .
tgtcctggcacccaagcccatgccgtggctgctggtccccctgctgggccatgtctggca

.    .    .    .    .    .    .    .    .    .    .    .
ctgctttccagcatggtgagggctgaggtgacccttgtctctgtgttcttgtcccccca

         |2071     |2081     |2091     |2101     |2111     |2121
CTTGTGGAGCCTCTTACACCCAGTGGAGAAGCTCCCAACCAAGCTCTCTTGAGGATCTTG
L  V  E  P  L  T  P  S  G  E  A  P  N  Q  A  L  L  R  I  L
         |691                          |701

         |2131     |2141     |2151     |2161     |2171     |2181
AAGGAAACTGAATTCAAAAAGATCAAAGTGCTGGGCTCCGGTGCGTTCGGCACGGTGTAT
K  E  T  E  F  K  K  I  K  V  L  G  S  G  A  F  G  T  V  Y
         |711                          |721

       .    .    .    .    .    .    .    .    .    .    .
AAGgtaaggtccctggcacaggcctctgggctgggccgcagggcctctcatggtctggtg
K

  .    .    .    .    .    .    .    .    .    .    .    .
gggagcccagagtccttgcaagctgtatatttccatcatctactttactctttgtttcac

  .    .    .    .    .    .    .    .    .    .    .    .
tgagtgtttgggaaactccagtgtttttcccaagttattgagaggaaatcttttataacc

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

```
acagtaatcagtggtcctgtgagaccaattcacagaccaaaggcatttttatgaaagggg

  .    .    .    .    .    .    .    .    .    .    .    .
ccattgaccttgccatggggtgcagcacagggcgggaggagggccgcctctcaccgcacg

  .
gca


Exon 19 | Start: 160690 | End: 160789 | Length: 99


.    .    .    .    .    .    .    .    .    .    .    .
gttaggcctagacgcagcatcattaaattctggatgaaatgatccacacggactttataa

.    .    .    .    .    .    .    .    .    .    .    .
caggctttacaagcttgagattcttttatctaaataatcagtgtgattcgtggagcccaa

.    .    .    .    .    .    .    .    .    .    .    .
cagctgcagggctgcgggggcgtcacagcccccagcaatatcagccttaggtgcggctcc

.    .    .    .    .    .    .    .    .    .    .    .
acagccccagtgtccctcaccttcggggtgcatcgctggtaacatccacccagatcactg

.    .    .    .    .    .    .    .    .    .    .    .
ggcagcatgtggcaccatctcacaattgccagttaacgtcttccttctctctctgtcata

      |2191     |2201     |2211     |2221     |2231     |2241
GGACTCTGGATCCCAGAAGGTGAGAAAGTTAAAATTCCCGTCGCTATCAAGGAATTAAGA
G  L  W  I  P  E  G  E  K  V  K  I  P  V  A  I  K  E  L  R
      |731                          |741

      |2251     |2261     |2271     |2281  .    .    .    .
GAAGCAACATCTCCGAAAGCCAACAAGGAAATCCTCGATgtgagtttctgctttgctgtg
E  A  T  S  P  K  A  N  K  E  I  L  D
      |751                          |761

   .    .    .    .    .    .    .    .    .    .    .    .
tgggggtccatggctctgaacctcaggcccacctttctcatgtctggcagctgctctgc

   .    .    .    .    .    .    .    .    .    .    .    .
tctagaccctgctcatctccacatcctaaatgttcactttctatgtctttccctttctag

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

```
ctctagtgggtataactccctccccttagagacagcactggcctctcccatgctggtatc

   .    .    .    .    .    .    .    .    .    .    .    .
caccccaaaaggctggaaacaggcaattactggcatctacccagcactagtttcttgaca

   .    .    .    .    .    .    .    .
cgcatgatgagtgagtgctcttggtgagcctggagcatg


Exon 20 | Start: 167261 | End: 167447 | Length: 186


.    .    .    .    .    .    .    .    .    .    .    .
caggtgactccgactcctcctttatccaatgtgctcctcatggccactgttgcctgggcc

.    .    .    .    .    .    .    .    .    .    .    .
tctctgtcatggggaatccccagatgcacccaggaggggccctctcccactgcatctgtc

.    .    .    .    .    .    .    .    .    .    .    .
acttcacagccctgcgtaaacgtccctgtgctaggtcttttgcaggcacagcttttcctc

.    .    .    .    .    .    .    .    .    .    .    .
catgagtacgtattttgaaactcaagatcgcattcatgcgtcttcacctggaaggggtcc

.    .    .    .    .    .    .    .    .    .    .    .
atgtgcccctccttctggccaccatgcgaagccacactgacgtgcctctccctccctcca

       |2291     |2301     |2311     |2321     |2331     |2341
GAAGCCTACGTGATGGCCAGCGTGGACAACCCCCACGTGTGCCGCCTGCTGGGCATCTGC
E  A  Y  V  M  A  S  V  D  N  P  H  V  C  R  L  L  G  I  C
                         |771                          |781

       |2351     |2361     |2371     |2381     |2391     |2401
CTCACCTCCACCGTGCAGCTCATCACGCAGCTCATGCCCTTCGGCTGCCTCCTGGACTAT
L  T  S  T  V  Q  L  I  T  Q  L  M  P  F  G  C  L  L  D  Y
                         |791                          |801

       |2411     |2421     |2431     |2441     |2451     |2461
GTCCGGGAACACAAAGACAATATTGGCTCCCAGTACCTGCTCAACTGGTGTGTGCAGATC
V  R  E  H  K  D  N  I  G  S  Q  Y  L  L  N  W  C  V  Q  I
                         |811                          |821

          .    .    .    .    .    .    .    .    .    .
GCAAAGgtaatcagggaagggagatacggggaggggagataaggagccaggatcctcaca
```

```
A  K


.    .    .    .    .    .    .    .    .    .    .    .
tgcggtctgcgctcctgggatagcaagagtttgccatggggatatgtgtgtgcgtgcatg

.    .    .    .    .    .    .    .    .    .    .    .
cagcacacacacattcctttatttggattcaatcaagttgatcttcttgtgcacaaatc

.    .    .    .    .    .    .    .    .    .    .    .
agtgcctgtcccatctgcatgtggaaactctcatcaatcagctacctttgaagaattttc

.    .    .    .    .    .    .    .    .    .    .    .
tctttattgagtgctcagtgtggtctgatgtctctgttcttatttctctggaattctttg

.    .
tgaata


Exon 21 | Start: 177687 | End: 177843 | Length: 156


.    .    .    .    .    .    .    .    .    .    .    .
taagttcaagcccaggtctcaactgggcagcagagctcctgctcttctttgtcctcatat

.    .    .    .    .    .    .    .    .    .    .    .
acgagcacctctggacttaaaacttgaggaactggatggagaaaagttaatggtcagcag

.    .    .    .    .    .    .    .    .    .    .    .
cgggttacatcttctttcatgcgcctttccattctttggatcagtagtcactaacgttcg

.    .    .    .    .    .    .    .    .    .    .    .
ccagccataagtcctcgacgtggagaggctcagagcctggcatgaacatgaccctgaatt

.    .    .    .    .    .    .    .    .    .    .    .
cggatgcagagcttcttcccatgatgatctgtccctcacagcagggtcttctctgtttca

 |2471     |2481     |2491     |2501     |2511     |2521
GGCATGAACTACTTGGAGGACCGTCGCTTGGTGCACCGCGACCTGGCAGCCAGGAACGTA
G  M  N  Y  L  E  D  R  R  L  V  H  R  D  L  A  A  R  N  V
                    |831                          |841

 |2531     |2541     |2551     |2561     |2571     |2581
CTGGTGAAAACACCGCAGCATGTCAAGATCACAGATTTTGGGCTGGCCAAACTGCTGGGT
```

```
L  V  K  T  P  Q  H  V  K  I  T  D  F  G  L  A  K  L  L  G
                     |851                        |861

 |2591     |2601     |2611     |2621    .    .    .    .
GCGGAAGAGAAAGAATACCATGCAGAAGGAGGCAAAgtaaggaggtggctttaggtcagc
A  E  E  K  E  Y  H  A  E  G  G  K
                     |871

.    .    .    .    .    .    .    .    .    .    .    .
cagcattttcctgacaccagggaccaggctgccttcccactagctgtattgtttaacaca

.    .    .    .    .    .    .    .    .    .    .    .
tgcaggggaggatgctctccagacattctgggtgagctcgcagcagctgctgctggcagc

.    .    .    .    .    .    .    .    .    .    .    .
tgggtccagccagggtctcctggtagtgtgagccagagctgctttgggaacagtacttgc

.    .    .    .    .    .    .    .    .    .    .    .
tgggacagtgaatgaggatgttatccccaggtgatcattagcaaatgttaggtttcagtc

.    .    .    .    .    .    .    .
tctccctgcaggatatataagtccccttcaatagcg
```

Exon 22 | Start: 178734 | End: 178810 | Length: 76

```
.    .    .    .    .    .    .    .    .    .    .    .
ctgggccctgaaaacacacgcagacctggatgagtgaggccactgggcacaaccagggct

.    .    .    .    .    .    .    .    .    .    .    .
cccagctcaccagagcagcctgggacacagagggtgctcagaaacctaccagagcagccc

.    .    .    .    .    .    .    .    .    .    .    .
tgaactccgtcagactgaaatcccctgttgccgggaggaggcgccgggcctgggggacgg

.    .    .    .    .    .    .    .    .    .    .    .
gtcctggggtgatctggctcgtctgtgtgtgtcactcgtaattaggtccagagtgagtta

.    .    .    .    .    .    .    .    .    .    .    .
acttttccaacagagggaaactaatagttgtctcactgcctcatctctcaccatcccaa

     |2631     |2641     |2651     |2661     |2671     |2681
GTGCCTATCAAGTGGATGGCATTGGAATCAATTTTACACAGAATCTATACCCACCAGAGT
```

```
V  P  I  K  W  M  A  L  E  S  I  L  H  R  I  Y  T  H  Q  S
               |881                        |891

     |2691     |2701.    .    .    .    .    .    .
GATGTCTGGAGCTACGgtgagtcataatcctgatgctaatgagtttgtactgaggccaag
D  V  W  S  Y  G
               |901

.    .    .    .    .    .    .    .    .    .    .    .
ctggcttttattgttagttaatttacattatatcctctgacatgcaagtattttctttcg

.    .    .    .    .    .    .    .    .    .    .    .
agataatgactaatgataatgtaatcattgctgtctatctattgtactgagaaaacacgg

.    .    .    .    .    .    .    .    .    .    .    .
cagaggaaatcgagtccagctgccgtccaaaagtcactggagattgcaatgagctcgtct

.    .    .    .    .    .    .    .    .    .    .    .
ggcagggtgggggtatgggagggaaagagcttaggaaacggctctccctgcaaagtcca

.    .    .    .
accaaactttaacgtt
```

Exon 23 | Start: 184685 | End: 184832 | Length: 147

```
.    .    .    .    .    .    .    .    .    .    .    .
tgttaattaccaaagtttaccacttatcagtcacttactacttgctgggcattgcactaa

.    .    .    .    .    .    .    .    .    .    .    .
gcatttcagttgtattatcttgttgggtccttacagcaatcctgtgaaacagatactgct

.    .    .    .    .    .    .    .    .    .    .    .
attaccccactttatagagaggtagactgaggcttccagcattgaagcaaattgcccaag

.    .    .    .    .    .    .    .    .    .    .    .
actacagaaatgtaggtttctaaacatcaagaaacagtaaccagtaatgatgactaaagc

.    .    .    .    .    .    .    .    .    .    .    .
aagggattgtgattgttcattcatgatcccactgccttcttttcttgcttcatcctctca

          |2711     |2721     |2731     |2741     |2751     |2761
GGGTGACCGTTTGGGAGTTGATGACCTTTGGATCCAAGCCATATGACGGAATCCCTGCCA
```

```
  V  T  V  W  E  L  M  T  F  G  S  K  P  Y  D  G  I  P  A  S
                           |911                        |921

         |2771     |2781     |2791     |2801     |2811     |2821
GCGAGATCTCCTCCATCCTGGAGAAAGGAGAACGCCTCCCTCAGCCACCCATATGTACCA
  E  I  S  S  I  L  E  K  G  E  R  L  P  Q  P  P  I  C  T  I
                           |931                        |941

         |2831     |2841       .    .    .    .    .    .
TCGATGTCTACATGATCATGGTCAAGTgtgagtgactggtgggtctgtccacactgccta
  D  V  Y  M  I  M  V  K  C


 .    .    .    .    .    .    .    .    .    .    .    .
gctgagccttggtggctgctcttagccaaacagctgaggcctttgcatccctggagaaat

 .    .    .    .    .    .    .    .    .    .    .    .
gtcatcacattacttaaggcaggcacacaaatccagaaacatctgtaaataccccttcaa

 .    .    .    .    .    .    .    .    .    .    .    .
gcattcttttaaagacacttcttgactcattgggcagtatgacctgacatttgcccatgt

 .    .    .    .    .    .    .    .    .    .    .    .
ttgcaagcaaataaataaaactaaagtcttccgcaagccattacaccaaaatattctatt

 .    .    .    .    .    .
cgctgagttactcaatgaaataccgag


Exon 24 | Start: 186284 | End: 186382 | Length: 98


.    .    .    .    .    .    .    .    .    .    .    .
acagacccacactgctccatcccctcaggcgtaacacaggatgctgaccccaggaagagt

.    .    .    .    .    .    .    .    .    .    .    .
gggcgtagaaaaactagagggcattattgttattctgattcaaatgtacagtgctggcat

.    .    .    .    .    .    .    .    .    .    .    .
ggtctttaaacagtaaccagtactagctggccaagacagaaaagtctaccacaaagactt

.    .    .    .    .    .    .    .    .    .    .    .
ggttctttcatcacttatttgactggaagtgtcgcatcaccaatgccttctttaagcaat
```

```
.    .    .    .    .    .    .    .    .    .    .    .
gccatctttatcatttcttccagtgttctaattgcactgtttttttctcattccttcccca

  |2851     |2861     |2871     |2881     |2891     |2901
GCTGGATGATAGACGCAGATAGTCGCCCAAAGTTCCGTGAGTTGATCATCGAATTCTCCA
  W  M  I  D  A  D  S  R  P  K  F  R  E  L  I  I  E  F  S  K
  |951                          |961

  |2911     |2921     |2931     |2941     .    .    .    .
AAATGGCCCGAGACCCCCAGCGCTACCTTGTCATTCAGgtacaaattgcagtctgtgctt
  M  A  R  D  P  Q  R  Y  L  V  I  Q
  |971                          |981

  .    .    .    .    .    .    .    .    .    .    .    .
ccattgggaagagtccctctaatgagcatctcatgtcactgtgttctgtcacatgccagc

  .    .    .    .    .    .    .    .    .    .    .    .
ctggcctccctgtgtcccagatcgcattattaaaccctccagcgcattagagcaagcctc

  .    .    .    .    .    .    .    .    .    .    .    .
agtaaggcgcaggccacatcgtgaactaagcagcatccgtgagtggggcccacccaactc

  .    .    .    .    .    .    .    .    .    .    .    .
catctccccctccccgtctgaactctcctctggtgctcgtcctcactgtccggctagcca

  .    .    .    .    .    .    .    .
aagcctcagctgggtctaagagagaagcatggtctatt
```

Exon 25 | Start: 187156 | End: 187324 | Length: 168

```
.    .    .    .    .    .    .    .    .    .    .    .
tcacagcaaggtgcacactcgatgaatgctgcagcttcttccctttctgtttcctcagaa

.    .    .    .    .    .    .    .    .    .    .    .
gctatttgaatctcatgtaggggctttcaagcatcaaaggatggttcatgttttatttta

.    .    .    .    .    .    .    .    .    .    .    .
aggcacccacatcatgtcatgaggggaggcagctataatttagagaaccaaaggggattt

.    .    .    .    .    .    .    .    .    .    .    .
cattataacaaaattggcaaacacacaggcacctgctggcaatagacccctgctcctata
```

```
.    .    .    .    .    .    .    .    .    .    .    .
gccaagaagtggaatagcatctctacgggccattctaatagcctcaaaatctctgcacca

    |2951     |2961     |2971     |2981     |2991     |3001
GGGGATGAAAGAATGCATTTGCCAAGTCCTACAGACTCCAACTTCTACCGTGCCCTGATG
G  D  E  R  M  H  L  P  S  P  T  D  S  N  F  Y  R  A  L  M
                       |991                          |1001

    |3011     |3021     |3031     |3041     |3051     |3061
GATGAAGAAGACATGGACGACGTGGTGGATGCCGACGAGTACCTCATCCCACAGCAGGGC
D  E  E  D  M  D  D  V  V  D  A  D  E  Y  L  I  P  Q  Q  G
                       |1011                         |1021

    |3071     |3081     |3091     |3101     |3111   .    .
TTCTTCAGCAGCCCCTCCACGTCACGGACTCCCCTCCTGAGCTCTCTGgtatgaaatctc
F  F  S  S  P  S  T  S  R  T  P  L  L  S  S  L
                       |1031

  .    .    .    .    .    .    .    .    .    .    .    .
tgtctctctctctctctcaagctgtgtctactcatttgaacaaattgaattttagggaaa

  .    .    .    .    .    .    .    .    .    .    .    .
ataaccatctagtgaaactcacatggatatgaagtcaattttaaccaaatggtaaaatca

  .    .    .    .    .    .    .    .    .    .    .    .
aaatcaaaataaattaagtgtattaattattttgttgcattgcaacaacttgattgtaag

  .    .    .    .    .    .    .    .    .    .    .    .
ccttttaggtccactatggaatgtaattaaatcaaaactaaacctagttgctctaaaact

  .    .    .    .    .    .    .    .    .    .
aacgattaagacaaaaattaaacaccttcacaatataccctccatgag
```

Exon 26 | Start: 187703 | End: 187751 | Length: 48

```
.    .    .    .    .    .    .    .    .    .    .    .
atctagtgaaactcacatggatatgaagtcaattttaaccaaatggtaaaatcaaaatca

.    .    .    .    .    .    .    .    .    .    .    .
aaataaattaagtgtattaattattttgttgcattgcaacaacttgattgtaagccttt

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

```
aggtccactatggaatgtaattaaatcaaaactaaacctagttgctctaaaactaacgat

.    .    .    .    .    .    .    .    .    .    .    .
taagacaaaaattaaacaccttcacaatataccctccatgaggcacaccacctgcattca

.    .    .    .    .    .    .    .    .    .    .    .
ggaaaagtggatgagatgtggtacaagcattccatgggcaacttctctgtttctttttca

      |3121     |3131     |3141     |3151     |3161 .    .
AGTGCAACCAGCAACAATTCCACCGTGGCTTGCATTGATAGAAATGGGgtatgtatgaac
S  A  T  S  N  N  S  T  V  A  C  I  D  R  N  G
      |1041                        |1051

  .    .    .    .    .    .    .    .    .    .    .    .
accttataagccagaatttacagctctccactatggctctattttacatggaaaatgcct

  .    .    .    .    .    .    .    .    .    .    .    .
taacctaaataatttaacccagataatcttgagttttcttcctgtgtgggtttttccct

  .    .    .    .    .    .    .    .    .    .    .    .
gcacggctgtcacgcctcacagtgccgttcaaagcgtgactcctggaccagtagtagcat

  .    .    .    .    .    .    .    .    .    .    .    .
cgcctggccttgttagaaacgccatttttcaggccactgccccagtttgaccaaatcagg

  .    .    .    .    .    .    .    .    .    .
acctctgggggtggcacccagtagtctatgtttgagccactttccagg


Exon 27 | Start: 188485 | End: 188594 | Length: 109


.    .    .    .    .    .    .    .    .    .    .    .
tctcacacatgtgaagtgtccagtagccacacgtggctagtggtgaccgtattgaagagc

.    .    .    .    .    .    .    .    .    .    .    .
accgctcatagcacacctccctcactgcggaaagttctgctgtacagcacccagcacagc

.    .    .    .    .    .    .    .    .    .    .    .
cctgctgcccaccctgcagcctgtggcccagtagcaccagcacccaccagggtgcagact

.    .    .    .    .    .    .    .    .    .    .    .
ctcaggcctgcccaacctactaatcagaaccagcatctcaaggagatctcgggtgatttt
```

```
.    .    .    .    .    .    .    .    .    .    .    .
tgcaaacactgaagttggggcagccctgaccggagtaaccttccctcatttcctcctgca

        |3171     |3181     |3191     |3201     |3211     |3221
CTGCAAAGCTGTCCCATCAAGGAAGACAGCTTCTTGCAGCGATACAGCTCAGACCCCACA
L  Q  S  C  P  I  K  E  D  S  F  L  Q  R  Y  S  S  D  P  T
                 |1061                          |1071

        |3231     |3241     |3251     |3261     |3271.    .
GGCGCCTTGACTGAGGACAGCATAGACGACACCTTCCTCCCAGTGCCTGgtgagtggctt
G  A  L  T  E  D  S  I  D  D  T  F  L  P  V  P  E
                 |1081                          |1091

   .    .    .    .    .    .    .    .    .    .    .    .
gtctggaaacagtcctgctcctcaacctcctcgacccactcagcagcagccagtctccag

   .    .    .    .    .    .    .    .    .    .    .    .
tgtccaagccaggtgctccctccagcatctccagagggggaaacagtggcagatttgcag

   .    .    .    .    .    .    .    .    .    .    .    .
acacagtgaagggcgtaaggagcagataaacacatgaccgagcctgcacaagctctttgt

   .    .    .    .    .    .    .    .    .    .    .    .
tgtgtctggttgtttgctgtacctctgttgtaagaatgaatctgcaaaatttctagctta

   .    .    .    .    .    .    .    .    .    .
tgaagcaaatcacggacatacacatctgtgtgtgtgagtgttcatgatg
```

Exon 28 | Start: 191224 | End: 193307 | Length: 2083

```
.    .    .    .    .    .    .    .    .    .    .    .
tacacatcacacatatatgtatacatgcatacacatacacacacacatacacacactctc

.    .    .    .    .    .    .    .    .    .    .    .
ctcaaggcagtttatcctctgagaactttaaatttacaaaagacacatatgtccattact

.    .    .    .    .    .    .    .    .    .    .    .
ttgagaaggacaggaaagaacccactttcttttgcagcaacagcaagagggccctcccga

.    .    .    .    .    .    .    .    .    .    .    .
ggctcctgctccctgtcataagtctccttgttgaggacattcacagggttcagaacccag
```

```
.    .    .    .    .    .    .    .    .    .    .    .
ggatcctgcatgggatggtgctttgctgattacttcacctctgatttctttccactttca

         |3281     |3291     |3301     |3311     |3321     |3331
AATACATAAACCAGTCCGTTCCCAAAAGGCCCGCTGGCTCTGTGCAGAATCCTGTCTATC
  Y  I  N  Q  S  V  P  K  R  P  A  G  S  V  Q  N  P  V  Y  H
                           |1101                          |1111

         |3341     |3351     |3361     |3371     |3381     |3391
ACAATCAGCCTCTGAACCCCGCGCCCAGCAGAGACCCACACTACCAGGACCCCCACAGCA
  N  Q  P  L  N  P  A  P  S  R  D  P  H  Y  Q  D  P  H  S  T
                           |1121                          |1131

         |3401     |3411     |3421     |3431     |3441     |3451
CTGCAGTGGGCAACCCCGAGTATCTCAACACTGTCCAGCCCACCTGTGTCAACAGCACAT
  A  V  G  N  P  E  Y  L  N  T  V  Q  P  T  C  V  N  S  T  F
                           |1141                          |1151

         |3461     |3471     |3481     |3491     |3501     |3511
TCGACAGCCCTGCCCACTGGGCCCAGAAAGGCAGCCACCAAATTAGCCTGGACAACCCTG
  D  S  P  A  H  W  A  Q  K  G  S  H  Q  I  S  L  D  N  P  D
                           |1161                          |1171

         |3521     |3531     |3541     |3551     |3561     |3571
ACTACCAGCAGGACTTCTTTCCCAAGGAAGCCAAGCCAAATGGCATCTTTAAGGGCTCCA
  Y  Q  Q  D  F  F  P  K  E  A  K  P  N  G  I  F  K  G  S  T
                           |1181                          |1191

         |3581     |3591     |3601     |3611     |3621     |3631
CAGCTGAAAATGCAGAATACCTAAGGGTCGCGCCACAAAGCAGTGAATTTATTGGAGCAT
  A  E  N  A  E  Y  L  R  V  A  P  Q  S  S  E  F  I  G  A  *
                           |1201                          |1211

  |+1       |+11       |+21       |+31       |+41       |+51
GACCACGGAGGATAGTATGAGCCCTAAAAATCCAGACTCTTTCGATACCCAGGACCAAGC



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

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

  |+181     |+191      |+201      |+211      |+221      |+231
GTTGCATTCCTTTGTCTTCAAACTGTGAAGCATTTACAGAAACGCATCCAGCAAGAATAT
```

```
  |+241      |+251      |+261      |+271      |+281      |+291
TGTCCCTTTGAGCAGAAATTTATCTTTCAAAGAGGTATATTTGAAAAAAAAAAAAAAGTAT

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

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

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

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

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

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

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

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

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

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

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

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

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

  |+1081     |+1091     |+1101     |+1111     |+1121     |+1131
GTTTTCTCCTTTTACTTCACTTCAAAAGCTTTTTACTCAAAGAGTATATGTTCCCTCCAG
```

```
  |+1141     |+1151     |+1161     |+1171     |+1181     |+1191
GTCAGCTGCCCCCAAACCCCCTCCTTACGCTTTGTCACACAAAAAGTGTCTCTGCCTTGA

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

  |+1261     |+1271     |+1281     |+1291     |+1301     |+1311
CAGTAGCATTATGAGTAGTGTGGAATTCAGGTAGTAAATATGAAACTAGGGTTTGAAATT

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

  |+1381     |+1391     |+1401     |+1411     |+1421     |+1431
ATTTCTCTACAATTGGAAGATTGGAAGATTCAGCTAGTTAGGAGCCCACCTTTTTTCCTA

  |+1441     |+1451     |+1461     |+1471     |+1481     |+1491
ATCTGTGTGTGCCCTGTAACCTGACTGGTTAACAGCAGTCCTTTGTAAACAGTGTTTTAA

  |+1501     |+1511     |+1521     |+1531     |+1541     |+1551
ACTCTCCTAGTCAATATCCACCCCATCCAATTTATCAAGGAAGAAATGGTTCAGAAAATA

  |+1561     |+1571     |+1581     |+1591     |+1601     |+1611
TTTTCAGCCTACAGTTATGTTCAGTCACACACACATACAAAATGTTCCTTTTGCTTTTAA

  |+1621     |+1631     |+1641     |+1651     |+1661     |+1671
AGTAATTTTTGACTCCCAGATCAGTCAGAGCCCCTACAGCATTGTTAAGAAAGTATTTGA

  |+1681     |+1691     |+1701     |+1711     |+1721     .     .
TTTTTGTCTCAATGAAAATAAAACTATATTCATTTCCACTCTAttatgctctcaaatacc

  .     .     .     .     .     .     .     .     .     .     .     .
cctaagcatctatactagcctggtatgggtatgaaagatacaaagataaataaaacatag

  .     .     .     .     .     .     .     .     .     .     .     .
tccctgattctaagaaattcacaatttagcaaaggaaatggactcatagatgctaacctt

  .     .     .     .     .     .     .     .     .     .     .     .
aaaacaacgtgacaaatgccagacaggacccatcagccaggcactgtgagagcacagagc

  .     .     .     .     .     .     .     .     .     .     .     .
agggaggttgggtcctgcctgaggagacctggaagggaggcctcacaggaggatgaccag

  .     .     .     .     .     .     .     .     .
gtctcagtcagcggggaggtggaaagtgcaggtgcatcagggg
```

```
GBK Parser: Version: 0.9, Version Date: 11/02/2015
Reader: Version: 1, Version Date: 11/02/2015
Writer: Version: 0.3, Version Date: 11/02/2015
Control: Version: 1, Version Date: 11/02/2015
```