

Gene: COL1A1 - Sequence: NG_007400.1
 Transcript: NM_000088.3 - Protein: NP_000079.2
 Date : February 17, 2015

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

Exon 1 | Start: 5001 | End: 5229 | Length: 228

```

. . . . .
agcagaggggcacccctaccactggttagcccacgccattctgaggaccagctgcacc

. . . . .
cctaccacagcacctctggcccaggctgggctggggggctggggaggcagagctgcgaag

. . . . .
aggggagatgtggggtggactcccttcctcctcctccccctctcattccaactccaa

. . . . .
attgggggcccggccaggcagctctgattggctggggcacgggcggcggctccccctct

. . . . .
ccgaggggaggggttcctccctgctctccatcaggacagtataaaaggggcccgggcag

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

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

      |1      |11      |21      |31      |41      |51
CTAGACATGTTTCAGCTTTGTGGACCTCCGGCTCCTGCTCCTCTTAGCGGCCACGCCCTC
      M F S F V D L R L L L L L A A T A L
      |1      |11

      |61      |71      |81      |91      |101      .
CTGACGCACGGCCAAGAGGAAGCCAAGTCGAGGGCCAAGACGAAGACAgtaagtcccaa
L T H G Q E E G Q V E G Q D E D I
      |21      |31

```

.
 acttttgggagtgcaaggatactctatatcgcgccttgcgcttggtcccgggggcccgcgg

 cttaaaacgagacgtggatgatccggagactcgggaatggaaggagatgatgagggctc

 ttctcggcgccctgagacaggaggagctcacctggggcgaggttggggttgaacgcg

 ccccgggagcgggaggtgagggtggagcgcggcgtgagttggtgcaagagagaatccga

 gcgcgaaccggggaagtggggatctgggtgcagagtgaggaaagcacg

Exon 2 | Start: 6693 | End: 6887 | Length: 194

.
 tttttatttcacttggcttcagcgccaatgggctgaggttggagttggaagccaccgcgg

 actaaagctttgtttaattcctgagaactggaaagagttacagcctccctggccaggcg

 cctcggcgtgtcacccgcgctgatgaggagcaggcgagcttttaaggatttgaggaaag

 aagaacggggggaggggcggggaagtgaaaaatccaagtgtgcctcttagacccgggggaa

 aggtggttaagctgggggttgagtcactactgacaacgcccctcttccgcctgtcccag

| | | | | | |
|---|-----|-----|-----|-----|-----|
| 111 | 121 | 131 | 141 | 151 | 161 |
| TCCCACCAATCACCTGCGTACAGAACGGCCTCAGGTACCATGACCGAGACGTGTGGA AAC | | | | | |
| P | P | I | T | C | V |
| | Q | N | G | L | R |
| | Y | H | D | R | D |
| | | | | V | W |
| | | | | K | P |
| | 41 | | | 51 | |
| | | | | | |
| 171 | 181 | 191 | 201 | 211 | 221 |
| CCGAGCCCTGCCGATCTGCGTCTGCGACAACGGCAAGGTGTTGTGCGATGACGTGATCT | | | | | |
| E | P | C | R | I | C |
| | V | C | D | N | G |
| | K | V | L | C | D |
| | | | | D | V |
| | | | | I | C |
| | 61 | | | 71 | |


```

. . . . .
taatctcctgccctcgaatTTTgcccctgcgcggcccgtgactcctcacagtcctccctt

. . . . . |341 |351
ctctaacctggcctcttgtttcttctccccaatcccacagGGACCCAAGGGAGACTG
G P K G D T G

|361
GCCCCGAGGCCCAAGGgtaagcgttgactctgggctgtggggggctgcaggtgggcat
P R G P R
|121

. . . . .
ggctctcggccccacgctcacccggccccgccctctccccctgcag

```

Exon 5 | Start: 7313 | End: 7414 | Length: 101

```

. . . . .
taagcgttgactctgggctgtggggggctgcaggtgggcatggctctcggccccacgct

. . . . . |371 |381 |391
caccccgccccgccctctccccctgcagGGACCCGAGGCCCCCTGGCCGAGATGGCA
G P A G P P G R D G I
|131

|401 |411 |421 |431 |441 |451
TCCCTGGACAGCCTGGACTTCCCGGACCCCGGACCCCGGACCTCCCGGACCCCTG
P G Q P G L P G P P G P P G P P G P P G
|141 |151

|461 |471 . . . . .
GCCTCGGAGGAgtaagtggagaggccttgtgtgtccactctcccctgttttgTTTTgtt
L G G

. . . . .
ttttggcagatgacataatTTTatactttgaaataatttcaaacttacagaaaagttgca

. . . . .
agaatcctacaggaaactctcacatacccttcacagtttgtgacatgtgctttattagtc

```

.
 tctgtttatgtatatgtatcttttttttctgaactgtttgagcaagttgctaacatcag

 gctcttttgcgccctaaatacttaggtgtgtttttcctaaaaacaagagcattctcttaac
 . . .
 tgacctacaca

Exon 6 | Start: 8136 | End: 8207 | Length: 71

.
 tgcgtttaatcatcatgtctctagttccacaaatgtagaacgttcctcagactttcttt

 gtcttttagtggcactgggagttttgatgagtcagttgttttgagactgtccctcaatt

 tgggattgtctcattagattagatgcagggatgcatctttgcaggaatgtcttaaagca

 atgttattcttctcagcacatcacaccaggaagtgcagtgatgtcagtttcttccatcctc

 agtgccgtcttctgcctttcaattcactgtcctcactctgacttctctgtttgttctag

| | | | | | | | | | | | | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 481 | 491 | 501 | 511 | 521 | 531 | | | | | | | | | | | | | |
| | AACTTTGCTCCCCAGCTGTCTTATGGCTATGATGAGAAATCAACCGGAGGAATTTCCGTG | | | | | | | | | | | | | | | | | | |
| N | F | A | P | Q | L | S | Y | G | Y | D | E | K | S | T | G | G | I | S | V |
| | 161 | | | 171 | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|--|-----|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | 541 | | | | | | | | | | | | | | | |
| CCTGGCCCCATGgtgagccagcagggggagcatggatgacagaagagagaatgggtatcc | | | | | | | | | | | | | | | | |
| P | G | P | M | | | | | | | | | | | | | |
| | 181 | | | | | | | | | | | | | | | |

.
 agaggaggtgggcataggcggctggtatagacagcttgggaggtccagatcacctttggg

 acctcagagtccagaaaggatgcaggacgactgggtggtcccaacaggcatgaatgacta

.
catccacatgctttcctacagagggatcaccatgacccccctttcttctccctctatag

Exon 7 | Start: 8435 | End: 8479 | Length: 44

.
tgagccagcagggggagcatggatgacagaagagagaatgggtatccagaggaggtgggc
.
ataggcggctggtatagacagcttgggaggtccagatcacctttgggacctcagagtcca
.
gaaaggatgcaggacgactgggtggtcccaacaggcatgaatgactacatccacatgctt
.
tcttacagagggatcaccatgacccccctttcttctccctctatagGGTCCCTCTGGTCC
|551
G P S G P

|561 |571 |581
TCGTGGTCTCCCTGGCCCCCTGGTGCACCTgtgagtatccaggacgtcttcatatgcct
R G L P G P P G A P
|191

.
ccttgggctttggtcttttggaggggaagactgggatgagggcaggagagatgctcagaga
.
tctcttggttaagattggagaagggtgacagggacttgtcttctaaccatcttttctt
.
cttctcaag

Exon 8 | Start: 8638 | End: 8691 | Length: 53

.
tgagtatccaggacgtcttcatatgcctccttgggctttggtcttttggaggggaagactg

.
 ggatgagggcaggagagatgctcagagatctcttggttaagattggagaagggttgacaggg

 |591 |601 |611
 acttgtcttctaaccatctttttccttcttctcaagGGTCCCAAGGCTTCCAAGGTCC
 G P Q G F Q G P
 |201

 |621 |631 |641
 CCCTGGTGAGCCTGGCGAGCCTGGAGCTTCAgtaagcactctctatacagattcatactc
 P G E P G E P G A S
 |211

 cttctacaaacacacagactctcctatagaagaactcccaggcctggggtcttccttacc

 tcttcccttcaatcccagccttccccttcttttttcttatccatattctaaccacctct

 . . .
 tctatcttttctag

Exon 9 | Start: 8855 | End: 8908 | Length: 53

.
 taagcactctctatacagattcatactccttctacaaacacacagactctcctatagaag

 aactcccaggcctggggtcttccttacctcttcccttcaatcccagccttccccttcttt

 |651
 ttttcttatccatattctaaccacctcttctatcttttctagGGTCCCATGGGTCCCCGA
 G P M G P R

 |661 |671 |681 |691
 GGTCCCCCAGGTCCCCCTGGAAAGAATGGAGATGATgtaagtatccccagcaagaagata
 G P P G P P G K N G D D
 |221 |231

ccatctgaccccatggcctccatgggttgggtcctgcaatttcactccaccacatttgg

 gaacgatactcagaggaaggagggaagtcctctctgatgcacggactgccctggaaca

 tgatcttttcgcttagtgagatgattccatgtccccaacaaagtgactgttctcctcacc

 ccagccaccttagagcaatccccaaccccatccctttggggaaattggtgcgagatggt

 gaaattaaaatgctggtgacagaagtagacagaaat

Exon 10 | Start: 9407 | End: 9460 | Length: 53

.
 ctcaccccagccaccttagagcaatccccaaccccatccctttggggaaattggtgcgca

 gatggtgaaattaaaatgctggtgacagaagtagacagaaattccttagaggcactcag

 atttcaccaaacgaaggtttcactgtagatttaaactgagctctagattcaaagataaga

 ttctgggcccccaacctgacctgcaacaatcaaagaagactgagaccttctccacttt

 tccagcccctaggcggtggtggggaggcagaggcatgatggtcttttctctccctctcag
 |701 |711 |721 |731 |741 .
 GGGGAAGCTGGAACCTGGTCGTCCTGGTGAGCGTGGGCCTCCTGGGCCTCAGgtgagc
 G E A G K P G R P G E R G P P G P Q
 |241

 agggggctgtggctgaacctgggcttcactgcacttgggcttcatttaggagctgggtcc

 acagtgatgtgttctaattggcccttccttgtcttcttcattctctccag

Exon 11 | Start: 9577 | End: 9630 | Length: 53

```
. . . . .
tgagcaggggctgtggctgaacctgggcttcactgcacttgggcttcatttaggagctg
. . . . . |751
ggtccacagtgatgtgttctaatggcccttccttgtcttctcatctctctccagGGTGC
G A
|251

|761 |771 |781 |791 |801 . .
TCGAGGATTGCCCCGAACAGCTGGCCTCCCTGGAATGAAGGGACACAGAgtgagtcacct
R G L P G T A G L P G M K G H R
|261

. . . . .
ttgagtcatttaagctccccaagtcacctagcatacccccatccagtcaccaacctcttccc
. . . . .
caaaagatactgagttgcatcatgggtgggtggcagctacagaagtcccaagggaagaga
. . . . .
gtggacatccaaaagcacctccctccatgggaaagcagtcgcatgaaacgattgggtga
. . . . .
gatctagagccagttggggttttagtctagctcagaaacaaagggatggcgggtgatgacct
. . . . .
cccaaggctctttctcagatctaggtggatgtcaaggctgttccacccc
```

Exon 12 | Start: 9970 | End: 10023 | Length: 53

```
. . . . .
agcatacccccatccagtcaccaacctcttccccaaaagatactgagttgcatcatgggtgg
. . . . .
gtggcagctacagaagtcccaagggaagagagtggtgacatccaaaagcacctccctccat
```

.
 gggaagcagtcggttaaacgattgggtgagatctagagccagttggggttagtcta

 gctcagaaacaaagggatggcggtgatgacctccaaggctcttctcagatctaggtgg

 atgtcaaggctgttcacccccctccacaggttcttaccttctacctcttctgctttag
 |811 |821 |831 |841 |851 .
 GGTTCAGTGGTTGGATGGTGCCAAGGGAGATGCTGGTCCTGCTGGTCCTAAGgtaaga
 G F S G L D G A K G D A G P A G P K
 |271 |281

 ggctgtctgaacatcatggctcctccacatcccagagtcaccacatgaatgaatttctca

 ctcatattctctgatctacag

Exon 13 | Start: 10112 | End: 10156 | Length: 44

.
 taagaggctgtctgaacatcatggctcctccacatcccagagtcaccacatgaatgaatt
 |861 |871 |881 |891
 tctcactcattattctctgatctacagGGTGAGCCTGGCAGCCCTGGTGAAAAATGGAGCT
 G E P G S P G E N G A
 |291
 |901
 CCTGGTCAGATGgtgagtggtgcccagttccagagggcagggatggggcaggaggcagggg
 P G Q M
 |301

 caagatggaggcctgggggaacaaggctgtctcccatctcatctgacttctcttggtttg
 . .
 gttgtcag

Exon 14 | Start: 10273 | End: 10326 | Length: 53

.
tgagtgtgccagttccagagggcagggatggggcaggaggcaggggcaagatggaggcc
.
tgggggaacaaggctgtctcccatctcatctgacttctcttggtttggtgtcagGGCCC
G P

|911 |921 |931 |941 |951 . . .
CCGTGGCCTGCCTGGTGAGAGAGGTGCGCCCTGGAGCCCCTGGCCCTGCTgtaagtactcc
R G L P G E R G R P G A P G P A
|311

.
tggccccttgggggatccctgagctctggaaggggctcccaggaactctagggactggc
.
cagtgtcagtggaacttaacggggcttcccctctctcctgcag

Exon 15 | Start: 10441 | End: 10485 | Length: 44

.
taagtactcctggccccttgggggatccctgagctctggaaggggctcccaggaactct
. |961
agggactggccagtgctcagtggaacttaacggggcttcccctctctcctgcagGGTGCTC
G A R
|321

|971 |981 |991 |1001
GTGGAATGATGGTGCTACTGGTGCTGCCGGGCCCCCTgtgagtgtggcctgtaggcctc
G N D G A T G A A G P P
|331

.
agggcctgggagtggggaggggtctcagtatctgctcttggggctgacaatgggagcagg

.
 ttatgttggctctgaaccccaggacttcctctgtcccagggtgtgacttgcagctgccatc

 tcttccttctcgtgacatctccatttcattcacag

Exon 16 | Start: 10664 | End: 10717 | Length: 53

.
 tgagtgtggcctgtaggcctcagggcctgggagtgaggagggtctcagtatctgctctt

 ggggctgacaatgggagcaggttatgttggctgaaccccaggacttcctctgtcccagg

 gtgtgacttgcagctgccatctcttccttctcgtgacatctccatttcattcacagGGT
 G

| | | | | | |
|---|-----------|------|------|------|---|
| 1011 | 1021 | 1031 | 1041 | 1051 | . |
| CCCACCGCCCGCTGGTCCTCCTGGCTTCCCTGGTGCTGTTGGTGCTAAG | gtgagaccc | | | | |
| P T G P A G P P G F P G A V G A K | | | | | |
| | 341 | | | 351 | |

.
 ccactctcctctaagcatgaccctcatgggccaaggggtcatgtctccctgttcccca

 aaccaaagggacccagagtggcaagagagcagccggttactaacacctttgtcctgggt

 tctccgtctctgatcttagagtcctgatcattgctctcctgtccctgtctccccttctc

 ctgccatcccagaggcaaggttgggtttccagggtggcttctgatatgtcctttcttc
 . . .
 tgattcag

Exon 17 | Start: 10975 | End: 11073 | Length: 98

.
 tgagacccccactctcctctaagcatgaccctcatgggccaaggggttcattgtctcct

 gttccccaaccaaagggaccagagtggcaagagagcagcccgttcactaacaccttg

 tcctgggttctccgtctctgatcttagagtcctgatcattgctctcctgtccctgtctcc

 ccttcctcctgccatcccagagaggcaagggttgggtttccagggtggcttctgatatgtc

 |1061 |1071 |1081 |1091
 ctttcttctgattcagGGTGAAGCTGGTCCCCAAGGGCCCCGAGGCTCTGAAGGTCCCCA
 G E A G P Q G P R G S E G P Q
 |361
 |1101 |1111 |1121 |1131 |1141 |1151 .
 GGGTGTGCGTGGTGAGCCTGGCCCCCTGGCCCTGCTGGTGCTGCTGGCCCTGCTgtaag
 G V R G E P G P P G P A G A A G P A
 |371 |381

 tgtccccgactcagtggtcccctttgccactttctaacctcagagtccttgccctgttgctg

 acactcctttctctgtgccacag

Exon 18 | Start: 11162 | End: 11206 | Length: 44

.
 taagtgtccccgactcagtggtcccctttgccactttctaacctcagagtccttgccctgtt
 |1161 |1171 |1181
 gctgacactcctttctctgtgccacagGGAAACCCTGGTGCTGATGGACAGCCTGGTGCT
 G N P G A D G Q P G A
 |391
 |1191

AAAGGTGCCAATgtaagtatcctgccaggcttcagtcacctcctgccgcctgcagcctg
K G A N

.
cctgccccctttccctctgctcctaggctcacgccctggctgtctgcctccacag

Exon 19 | Start: 11310 | End: 11408 | Length: 98

.
taagtatcctgccaggcttcagtcacctcctgccgcctgcagcctgcctgccccctttcc

. |1201 |1211
ctctgctcctaggctcacgccctggctgtctgcctccacagGGTGCTCCTGGTATTGCT
G A P G I A
|401

|1221 |1231 |1241 |1251 |1261 |1271
GGTGCTCCTGGCTTCCCTGGTGCCCGAGGCCCTCTGGACCCAGGGCCCGGCGGCCCT
G A P G F P G A R G P S G P Q G P G G P
|411 |421

|1281 |1291
CCTGGTCCCAAGGGTAACAGCgtgagtagtaccaaactctcccttctgccaccccatgcact
P G P K G N S
|431

.
ggctccagtgcggtctcatctggggagcaggaagacgcaggccaactgagcgccccga

.
ctctcagctcatcctcttctcccccttgag

Exon 20 | Start: 11540 | End: 11593 | Length: 53

.
tgagtaccaaactctcccttctgccaccccatgcactggctccagtgcggtctcatct

.
 ggggagcaggaagacgcaggccaactgagcgccccgactctcagctcatcctcttctcc

 . . . |1301 |1311 |1321 |1331 |1341
 ccccttgacagGGTGAACCTGGTGCTCCTGGCAGCAAAGGAGACACTGGTGCTAAGGGAGA
 G E P G A P G S K G D T G A K G E
 |441

 |1351
 GCCTgtaagtctccccgccatccttcttgagcccagcccaccctgccctaggagcccc
 P
 |451

 tgagggaatccagaaaggaagaggagcccctagtcttctgggggagtcctgccacacc

 cccaggaacccctgacactggaggcccagcctcagccggctctgaggctggcacaggatg

 gcccctcaccacaggccgcctcctcctctcggccctctccag

Exon 21 | Start: 11812 | End: 11919 | Length: 107

.
 taagtctccccgccatccttcttgagcccagcccaccctgccctaggagccccctgagg

 gaaatccagaaaggaagaggagcccctagtcttctgggggagtcctgccacacccccag

 gaaccctgacactggaggcccagcctcagccggctctgaggctggcacaggatggcccc

 |1361 |1371
 tcaccacaggccgcctcctcctctcggccctctccagGGCCCTGTTGGTGTTCAAGGACC
 G P V G V Q G P

 |1381 |1391 |1401 |1411 |1421 |1431
 CCCTGGCCCTGCTGGAGAGGAAGGAAAGCGAGGAGCTCGAGGTGAACCCGGACCCACTGG
 P G P A G E E G K R G A R G E P G P T G
 |461 |471

|1441 |1451 |1461.
 CCTGCCCGGACCCCTGGCGAGCGTgtaagtgtccctgcccgcctcccgctccaccc
 L P G P P G E R
 |481

.
 tcattgcctggctggtgcctgtgtgtcgcgagttcactggcctcctctcctcctgcag

Exon 22 | Start: 12014 | End: 12067 | Length: 53

.
 taagtgtccctgcccgcctcccgctccaccctcattgcctggctggtgcctgtgtgt
 |1471 |1481
 cgcgagttcactggcctcctctcctcctgcagGGTGGACCTGGTAGCCGTGGTTCCCT
 G G P G S R G F P
 |491

|1491 |1501 |1511
 GGCGCAGATGGTGTTGCTGGTCCCAAGgtaacctctccttgccggccggggggctgacct
 G A D G V A G P K
 |501

.
 gccgctccctgggcatcttcttctcttttggcccgtggcaaagagccacaaacttgaga

 ccctaactgttctgtgacttcccccaaccag

Exon 23 | Start: 12193 | End: 12291 | Length: 98

.
 taacctctccttgccggccgggggctgacctgccgctccctgggcatcttcttctctt

 ttggcccgtggcaaagagccacaaacttgagaccctaactgttctgtgacttcccccaa

. |1521 |1531 |1541 |1551 |1561 |1571
ccagGGTCCCGCTGGTGAACGTGGTTCTCCTGGCCCTGCTGGCCCCAAAGGATCTCCTGG
G P A G E R G S P G P A G P K G S P G
|511 |521

|1581 |1591 |1601 |1611 . . .
TGAAGCTGGTTCGTCCTGGTGAAGCTGGTCTGCCTGGTGCCAAGgtgaggccccaggcttt
E A G R P G E A G L P G A K
|531

.
cagcctggccttggccaggccctgaccatcccgtgtagggctctgggatgaggcggttctgga
.
tcaggccaagggtctgccctctggagtcctccccacctccatcatgcttctcccaag
.
tcccactcatacctctctgcctccctag

Exon 24 | Start: 12457 | End: 12510 | Length: 53

.
tgaggccccaggctttcagcctggccttggccaggccctgaccatcccgtgtagggctctgg
.
gatgaggcggttctggatcaggccaagggtctgccctctggagtcctccccacctccat
. |1621
catgcttctccccaagtcccactcatacctctctgcctccctagGGTCTGACTGGAAGCC
G L T G S P
|541

|1631 |1641 |1651 |1661
CTGGCAGCCCTGGTCCTGATGGCAAACTGGCCCCCTgtaagtatcactccccctgaac
G S P G P D G K T G P P
|551

.
cccctgccattgtcctgtctgcctccctgctgtcctcactgctgctttcgtgcctcccat
.
ccttag

Exon 25 | Start: 12599 | End: 12697 | Length: 98

```
. . . . .
taagtatcactccccctgaaccccctgccattgtcctgtctgcctccctgctgtcctcac

. . . . . |1671 |1681 |1691 |1701
tgctgctttcgtgcctcccatccttagGGTCCCGCCGGTCAAGATGGTCGCCCCGGACCC
                        G P A G Q D G R P G P
                        |561

|1711 |1721 |1731 |1741 |1751 |1761
CCAGGCCCCACCTGGTGCCCGTGGTCAGGCTGGTGTGATGGGATTCCCTGGACCTAAAGGT
P G P P G A R G Q A G V M G F P G P K G
|571 |581

GCTGCTgtgagtattaagtgaggatccatgaagagccagggacaaacacacctgagactt
A A

. . . . .
gaaggagtcctgggctctgggctcagctgtgccgctgacctgccgtgtggccactcactc

. . . . .
tcactttctggacctcagcctccctatctgtaaaatgaaagacttctcggcggggcacgg

. . . . .
tggctcatgcctgtaatcccagcactttgggaggccaaggcgggcagaccatgaggtcag

. . . . .
gagtttgagaccagtcgggccaacatagtgaaccacgtctctactaaaaatacaaaaga

. .
ttagct
```

Exon 26 | Start: 13593 | End: 13646 | Length: 53

.
 cagtcttgggtggattctttgaggtccaaaaggagatagcagagaagatgaaagccctttg

 cagtgcaggccacagcgggcatctaacagggaaaaggcagaggagcctggaaggcatct

 tgggaggagtgggctcagaaagggccagcaagaagcacctgcaggggcattccccgggg

 gccaaacagtcttttgaaaagaaagtccttaaaaagtcctcactcagagtaaagagagg

 cccagaggccctggcttctcacttcagccccctcaaccctaactccctttctccacag

 |1771 |1781 |1791 |1801 |1811 |1821.
 GGAGAGCCCGCAAGGCTGGAGAGCGAGGTGTCCCGGACCCCTGGCGCTGTCgtaagt
 G E P G K A G E R G V P G P P G A V
 |591 |601

 atctcctttccatccctacctccttcccattgctgccccggcactttctcctccctgcag

 gaggggtgctagaggccacggtcctcagctgctcggggcctcctaaccctgagttcccct

 ttgctctctccctgcag

Exon 27 | Start: 13790 | End: 13843 | Length: 53

.
 taagtatctcctttccatccctacctccttcccattgctgccccggcactttctcctccc

 tgcaggaggggtgctagaggccacggtcctcagctgctcggggcctcctaaccctgagtt

 |1831 |1841 |1851
 cccctttgctctctccctgcagGGTCCTGCTGGCAAAGATGGAGAGGCTGGAGCTCAGGG
 G P A G K D G E A G A Q G
 |611

| | | | | | | | |
|--|------|------|------|------|---|-----|---|
| 1941 | 1951 | 1961 | 1971 | 1981 | . | . | . |
| GTCCTGCTGGTCCTCCAGGTGAAGCAGGCAAACCTGGTGAACAGgtaagagggagcagcc | | | | | | | |
| P | A | G | P | P | G | E | A |
| | | | G | K | P | G | E |
| | | 651 | | | | 661 | |

.
 ggccagaggggtgggagatgcaggggaatccagagggacaggcccccgccttagctaatac

 agacagccatcaactagagggattgaggttagacgccgaaagaacttcctcccatgaag

 ggagcagcacagaggggaagtgggggctgcatgattgctagtctgggtgacttcttttaag

 agctgctggaatatgctgtgactttccctcaacccttctattgataaatcttggtccata

 gtttgaggaggggggaagcctttgacacatccctaggaggaaga

Exon 30 | Start: 14616 | End: 14660 | Length: 44

.
 ggaagtgggggctgcatgattgctagtctgggtgacttcttttaagagctgctggaatat

 gctgtgactttccctcaacccttctattgataaatcttggtccatagtttggggaggggg

 gaagcctttgacacatccctaggaggaagagaggggctgtttgggataatctcaattcag

 tgctgagaaggggttcctctctaatacacggccagaccccaggaggaaggaccgtgctttc

 cagcagagtggccccaggtgggttttgctcactgtctgttcctctctccctccccctcag

| | | | | | | |
|---|------|------|------|---|---|---|
| 1991 | 2001 | 2011 | 2021 | . | . | . |
| GGTGTTCTGGAGACCTTGGCGCCCTGGCCCCTCTGGAGCAAGAgtagtaggcctctc | | | | | | |
| G | V | P | G | D | L | G |
| | | A | P | G | P | S |
| | | | | G | A | R |
| | | 671 | | | | |

.
tcgctgcatccgtcaaggtgcgtcgtacttggccctatctccagagcagccttcacatgc
.
cctgtccttccttcttag

Exon 31 | Start: 14754 | End: 14852 | Length: 98

.
taagtaggcctctctcgtgcatccgtcaaggtgcgtcgtacttggccctatctccagag
. |2031 |2041 |2051
cagccttcacatgccctgtccttccttcttagGGCGAGAGAGGTTCCCTGGCGAGCGTG
G E R G F P G E R G
|681
|2061 |2071 |2081 |2091 |2101 |2111
GTGTGCAAGGTCCCCCTGGTCCTGCTGGTCCCGAGGGGCCAACGGTGCTCCCGGCAACG
V Q G P P G P A G P R G A N G A P G N D
|691 |701
|2121
ATGGTGCTAAGgtgagggcagcgtggaaggggctctggcaagtggcccagggaccaggctc
G A K
.
tcacccctcctgcagcaggggatggcgggccatgaccaaagccatggagatagggtgtgg
.
gggtggggggaaaagaccagggcagggggccacacacagcctggagtctgggctgtgagtc
.
ttttcatcttttctcaaggcttgtcgttggccttggaacaagcctgggagataccaagc
.
ggggcttagggctgtgacccactcttggggccccaggcctcactccagtcttcttgggttg
.
tcacatag

Exon 32 | Start: 15150 | End: 15257 | Length: 107

```
. . . . .
tgagggcagcgtggaaggggctctggcaagtggcccagggaccaggtctcacccctcctg
. . . . .
cagcaggggatggcgggcatgaccaaagccatggagatagggtgtgggtggggggaaa
. . . . .
agaccagggcagggggccacacacagcctggagtctgggctgtgagtcttttcacctttt
. . . . .
ctcaaggcttgtcgttggccttggaacaagcctgggagataccaagcggggcttagggc
. . . . . |2131
tgtgaccactcttggggccccaggcctcactccagtcttcttggttgccacatagGGTG
                                     G D
                                     |711

      |2141      |2151      |2161      |2171      |2181      |2191
ATGCTGGTGGCCCTGGAGCTCCCGGTAGCCAGGGCGCCCCTGGCCTTCAGGGAATGCCTG
  A  G  A  P  G  A  P  G  S  Q  G  A  P  G  L  Q  G  M  P  G
                        |721                                |731

      |2201      |2211      |2221      |2231      . . . .
GTGAACGTGGTGCAGCTGGTCTTCCAGGGCCTAAGGGTGACAGAgtaagttcaaccttc
  E  R  G  A  A  G  L  P  G  P  K  G  D  R
                        |741

. . . . .
ccctcccctgagccctacatggctcccatctctgcctgctttgaatctctcagcatctct
. . . . .
ccttctctctgggatctgtccctcttctcgctaatacctcccttcttcccctttcccctct
. . . . .
ggcctttttgctgatgaatcctctccctgtgggtccaggcccatctatcccatgggttac
. . . . .
catggtgatgagaggtgggggcatctccttggtggaggctcccttattcatcccgtaca
. . . . .
```

caagtcaggggcctcttaacctcagttccacctgagtctccagg

Exon 33 | Start: 15716 | End: 15823 | Length: 107

```
. . . . .
ctccctgtggtccaggcccatctatcccatgggttaccatggtgatgagaggtgggggc
. . . . .
atctccttggtggaggctcccttatcatcccgctacacaagtcaggggcctcttaacct
. . . . .
cagttccacctgagtctccaggcaggcacccttttctgaaagaatcttgagtccttg
. . . . .
gccaggtggaggcagggcagagctgcagaggcctctcaggaaaccagacacaagcag
. . . . .
aacactataggtcacctccttgccccacactggaaatctcaagcttatccatgtctttag

      |2241      |2251      |2261      |2271      |2281      |2291
GGTGATGCTGGTCCCAAAGGTGCTGATGGCTCTCCTGGCAAAGATGGCGTCCGTGGTCTG
G D A G P K G A D G S P G K D G V R G L
              |751                      |761

      |2301      |2311      |2321      |2331      |2341      .      .
ACTGGCCCCATTGGTCTCTGCTGGCCCTGCTGGTGGCCCTGGTGACAAGgtgaggtggcgcg
T G P I G P P G P A G A P G D K
              |771                      |781

. . . . .
cctccccaccttctgccctaacacatagcctcctcagcaggcctgggcacggttccgtgg
. . . . .
ggttgcggtgggagagcaggtcctgcaaactgagctgtcaacctgggaacctggaggga
. . . . .
ccagaaggaggggaggctctcctggggtcactactaggagtattcaggggaggccctga
. . . . .
ccctgagcctcttgctcccttgctctcag
```


Exon 34 | Start: 16044 | End: 16097 | Length: 53

```
. . . . .
tgaggtggccgcctccccaccttctgcctaacacatagcctcctcagcaggcctgggca
. . . . .
cggttccgtgggggttgcggtgggagagcaggtcctgcctgcaactgagctgtcaacctggga
. . . . .
acctggagggaccagaaggagggaggctctcctgggggtcatctactaggagtattcagg
. . . . . |2351 |2361
ggaggccctgaccctgagcctcttgcccttgctctcagGGTGAAAGTGGTCCCAGCGGC
                G E S G P S G

|2371 |2381 |2391 . . . . .
CCTGCTGGTCCCACTGGAGCTCGTGGTGCCCCGgtaagtacagaagacctgttaagacct
P A G P T G A R G A P
|791

. . . . .
catacttggcccttccctcccttcacacagcaccctggccctgtctgtgccttcacccc
. . . . .
ttgcctctcccctcacgcacatccccgccttccctcctgtcagcgcatctctccaatctga
. . . . .
ctccttttcttctag
```

Exon 35 | Start: 16260 | End: 16313 | Length: 53

```
. . . . .
taagtacagaagacctgttaagaccccatacttggcccttccctcccttcacacagcacc
. . . . .
cctggccctgtctgtgccttcaccccttgccctctcccctcacgcacatccccgccttccct
. . . . . |2401 |2411
```

cctgtcagcgcacatctctccaatctgactcctttttcttctagGGAGACCGTGGTGAGCCTG
 G D R G E P G
 |801

|2421 |2431 |2441 |2451.
 GTCCCCCGGCCCTGCTGGCTTTGCTGGCCCCCCTgtgagtaccaagaccccccatcat
 P P G P A G F A G P P
 |811

.
 ttcacaccgactgggacactgggacactcgaggacggaatgaggacaaaggcgtcagcca

 tcctcaggggagaagggtggagacgggattgtttccaccaagcatcttcctgcctcca

 ttactgctcctccccaggtagtggaaactcctgcctccttcctccattcaccgcctg
 . . .
 cttcctccccag

Exon 36 | Start: 16532 | End: 16639 | Length: 107

.
 tgagtaccaagaccccccatcatctttcatcaccgactgggacactgggacactcgaggacg

 gaatgaggacaaaggcgtcagccatcctcaggggagaagggtggagacgggattgtttcc

 cacccaagcatcttcctgcctccattactgctcctccccaggtagtggaaactcctgcc
 |2461 |2471
 tccttcctccattcaccgcctgcttcctccccagGGTGCTGACGGCCAACCTGGTGC
 G A D G Q P G A
 |821

|2481 |2491 |2501 |2511 |2521 |2531
 TAAAGGCGAACCTGGTGATGCTGGTGCTAAAGGCGATGCTGGTCCCCCTGGCCCTGCCGG
 K G E P G D A G A K G D A G P P G P A G
 |831 |841

|2541 |2551
 ACCCGCTGGACCCCTGGCCCCATTgtgagtggttgccctctgtgcccacgaggctgg
 P A G P P G P I
 |851

.
 tgggctgggacccaggacgggtccaggcttgatgcctctgtgctctcctacag

Exon 37 | Start: 16728 | End: 16781 | Length: 53

.
 tgagtggttgccctctgtgcccacgaggctgggtgggctgggacccaggacgggtccag
 |2561 |2571 |2581 |2591
 gcttgatgcctctgtgctctcctacagGGTAATGTTGGTGCTCCTGGAGCCAAAGGTGCT
 G N V G A P G A K G A
 |861

|2601 |2611
 CGCGGCAGCGCTGGTCCCCCTgtgagtatcacccgcctctctgttgagcctctcccctct
 R G S A G P P
 |871

.
 ccccaggcagcgggtggcaggtgagggcagctgggtcggatgagttggctgttctcctct

 gactgttcctatgttctctccttcag

Exon 38 | Start: 16908 | End: 16961 | Length: 53

.
 tgagtatcacccgcctctctgttgagcctctcccctctcccaggcagcgggtggcaggtg

 agggcagctgggtcggatgagttggctgttctcctctgactgttcctatgttctctcct
 . |2621 |2631 |2641 |2651 |2661

tccagGGTGCTACTGGTTTCCCTGGTGCTGCTGGCCGAGTCGGTCCTCCTGGCCCCCTCTg
 G A T G F P G A A G R V G P P G P S
 |881

.
 taagtctctgcagcagagtccactgctctaggttgggggtgctgggtgggggctgccaga

 aggatggtggggctgactgaggaccaatgatgcaccagagccccctggagtctgacagc

 ccctcctatcctcatccag

Exon 39 | Start: 17102 | End: 17263 | Length: 161

.
 taagtctctgcagcagagtccactgctctaggttgggggtgctgggtgggggctgccaga

 aggatggtggggctgactgaggaccaatgatgcaccagagccccctggagtctgacagc

 |2671 |2681 |2691 |2701
 ccctcctatcctcatccagGGAATGCTGGACCCCTGGCCCTCCTGGTCCTGCTGGCAA
 G N A G P P G P P G P A G K
 |891 |901

|2711 |2721 |2731 |2741 |2751 |2761
 AGAAGGCGGCAAAGGTCCCCGTGGTGAGACTGGCCCTGCTGGACGTCCTGGTGAAGTTGG
 E G G K G P R G E T G P A G R P G E V G
 |911 |921

|2771 |2781 |2791 |2801 |2811 |2821
 TCCCCCTGGTCCCCCTGGCCCTGCTGGCGAGAAAGGATCCCCTGGTGCTGATGGTCCTGC
 P P G P P G P A G E K G S P G A D G P A
 |931 |941

.
 Tgtaagtgccagctcagatctctgcagctccggaggtgtgcagagctggggaggggtccc

.

tgtgctgctctctggcacctcaccctgtttgcctcccaaag

Exon 40 | Start: 17365 | End: 17472 | Length: 107

.
taagtgccagctcagatctctgcagctccggaggtgtgcagagctggggaggggtccctg

. |2831 |2841
tgtgctctctctggcacctcaccctgtttgcctcccaaagGGTGCTCCTGGTACTCCCGG
G A P G T P G

|2851 |2861 |2871 |2881 |2891 |2901
GCCTCAAGGTATTGCTGGACAGCGTGGTGTGGTCGGCCTGCCTGGTCAGAGAGGAGAGAG
P Q G I A G Q R G V V G L P G Q R G E R
|951 |961

|2911 |2921 |2931
AGGCTTCCCTGGTCTTCTGCCCCCTCTgtaagtgtccccctcaccttggggggccctga
G F P G L P G P S
|971

.
gaaaaaccatcacaggacttggagtggggcggagccaaggagaacagatttggttagagat

.
gactccagcggactcaagggtcctcccagaccctatctctggcctgactctttcttctcc

.
cttag

Exon 41 | Start: 17630 | End: 17737 | Length: 107

.
taagtgtccccctcaccttggggggccctgagaaaaaccatcacaggacttggagtgggg

.
cggagccaaggagaacagatttggttagagatgactccagcggactcaagggtcctcccag

. |2941 |2951 |2961
 accctatctctggcctgactctttcttctcccttagGGTGAACCTGGCAAACAAGGTCCC
 G E P G K Q G P
 |981

|2971 |2981 |2991 |3001 |3011 |3021
 TCTGGAGCAAGTGGTGAACGTGGTCCCCCTGGTCCCATGGGCCCCCTGGATTGGCTGGA
 S G A S G E R G P P G P M G P P G L A G
 |991 |1001

|3031 |3041
 CCCCTGGTGAATCTGGACGTGAGgtgagcagtcagccccagcccccatgccagttaccctcag
 P P G E S G R E
 |1011

.
 catggccattgtggccttgccctaagccctcttccccggctgactctcacttctctctctc
 . .
 tctctctgcag

Exon 42 | Start: 17845 | End: 17898 | Length: 53

.
 tgagcagtcagccccagcccccatgccagttaccctcagcatggccattgtggccttgccctaag
 |3051
 ccctcttccccggctgactctcacttctctctctctctctctctgcagGGGGCTCCTGGTGC
 G A P G A

|3061 |3071 |3081 |3091
 CGAAGGTCCCCCTGGACGAGACGGTTCTCCTGGCGCCAAGgtaagatggcaactccat
 E G S P G R D G S P G A K
 |1021 |1031

.
 gaccacagccttgtctgctgcttccctgccccatcctggcccttcacccggggctgaccc

 atattcccctgctctccccgccag

Exon 43 | Start: 18003 | End: 18110 | Length: 107

```
. . . . .
taagatggcaactccatgaccacagccttgctctgctgcttcctgccccatcctggcc

. . . . . |3101 |3111
cttcacccggggctgacctatattcccctgctctccccgccagGGTGACCGTGGTGAGAC
                                G D R G E T

|3121 |3131 |3141 |3151 |3161 |3171
CGGCCCCGCTGGACCCCTGGTGCTCCTGGTGCTCCTGGTGCCCTGGCCCCGTGGCCC
G P A G P P G A P G A P G A P G P V G P
|1041 |1051

|3181 |3191 |3201 . . . . .
TGCTGGCAAGAGTGGTGATCGTGGTGAGACTgtaagtagctgggctccagttccctgtac
A G K S G D R G E T
|1061

. . . . .
ctggtcaggccagggactcttcaggcctccttagaggcctggggatgggtgtcggacttc

. . . . .
accagggcagggggaggaaaggagatcctgcaagatgtcagggccttaatccaaaaaact

. . . . .
gagttaaagctcagccccaagtcctcctcccagacaggaccgcctctcccatgagttgg

. . . . .
ccccagctcccgtgaagattgcagtgaggagggtttccctgggagttgggagagatggcca

. . . . .
cagtgggaagcagctgaggagagagagatcc
```

Exon 44 | Start: 18491 | End: 18544 | Length: 53

.
 tcggacttcacccaggcaggggaggaaaggagatcctgcaagatgtcagggccttaatc

 caaaaaactgagttaaagctcagccccaagtcccctctcccagacaggaccgcctctccc

 atgagttggccccagctcccgtgaagattgcagtggggagggtttccctgggagttgggag

 agatggccacagtgggaagcagctgaggagagagagatccagcagaggggaggcctcatc

 ctgcagccccagcctcagccttccctggccaagagctcatgctttccttgctctccccag
 |3211 |3221 |3231 |3241 |3251 |3261.
 GGTCTGTGCTGGTCCCGCCGGTCCTGTGGGCCCTGTTGGCGCCCGTGGCCCGCCgtaagt
 G P A G P A G P V G P V G A R G P A
 |1071 |1081

 accctgctgtgtcccccatgcctttagaactctacagatgcagacagtgccccactcgat

 gccaatggaacttccgcctgacagtttgtccctttctctcttctag

Exon 45 | Start: 18657 | End: 18764 | Length: 107

.
 taagtaccctgctgtgtcccccatgcctttagaactctacagatgcagacagtgccccac

 tcgatgccaatggaacttccgcctgacagtttgtccctttctcttcttagGGACCCCAA
 G P Q

|3271 |3281 |3291 |3301 |3311 |3321
 GGCCCCCGTGGTGACAAGGGTGAGACAGGCGAACAGGGCGACAGAGGCATAAAGGGTCAC
 G P R G D K G E T G E Q G D R G I K G H
 |1091 |1101
 |3331 |3341 |3351 |3361

CGTGGCTTCTCTGGCCTCCAGGGTCCCCCTGGCCCTCCTgtaagtatgctcagccccctcc
R G F S G L Q G P P G P P
|1111 |1121

.
ccagtcccatgctgtgctgtgggataggaggggagcttcgcctcagtttccccctctg
.
gatagtcattctttcccctccctagtgaggactgggggtctgaagatttgtagggcatgtcc
.
aagtagcttctgagagggtaggggtacacagagaggattatgggagaggtctctgcct
.
atggacaccctcgggctagatttccagaataatgaaggggcatgggttgcccacactgcc
.
cttgtctctccagccaggccctcaggctacatttgacgc

Exon 46 | Start: 19103 | End: 19156 | Length: 53

.
ctgtgggataggaggggagcttcgcctcagtttccccctctggatagtcattctttccc
.
ctccctagtgaggactgggggtctgaagatttgtagggcatgtccaagtagcttctgagagg
.
gtgaggggtacacagagaggattatgggagaggtctctgcctatggacaccctcgggct
.
agatttccagaataatgaaggggcatgggttgcccacactgcccttgctctccagccag
.
gccctcaggctacatttgacgctcactgggcctgaactgccttttttatctgtccttcag
|3371 |3381 |3391 |3401 |3411 |3421 .
GGCTCTCCTGGTGAACAAGGTCCCTCTGGAGCCTCTGGTCCTGCTGGTCCCCGAgtaagt
G S P G E Q G P S G A S G P A G P R
|1131 |1141

.

catgccttctctctcctcttctgagccccaagcccaggctcacctcggggacccttgcc

 agggaccaggcaccctttgcctctctggagaagggttcaggacaggagtgaggcaaag

 agaggaagaatcctgaacaaacaatctgatctagctttggcctctctgctccccaatccg

 tcctcccctggctcagcggctgggaggagctatggcatgtcctatggaaagaggctgagg

 ctggctctatgagccgtggggccagagccagcaggagggtggtgggcctctcc

Exon 47 | Start: 19518 | End: 19625 | Length: 107

.
 ttgccagggaccaggcaccctttgcctctctggagaagggttcaggacaggagtgagg

 caaagagaggaagaatcctgaacaaacaatctgatctagctttggcctctctgctcccca

 atccgtcctcccctggctcagcggctgggaggagctatggcatgtcctatggaaagaggc

 tgaggctggctctatgagccgtggggccagagccagcaggagggtggtgggcctctcct

 ccagagctgggggttggtcgggcttctggcagcctttctcaaaccatttccccactccag

| | | | | | |
|--|------|------|------|-------|------|
| 3431 | 3441 | 3451 | 3461 | 3471 | 3481 |
| GGTCCCCCTGGCTCTGCTGGTGCTCCTGGCAAAGATGGACTCAACGGTCTCCCTGGCCCC | | | | | |
| G P P G S A G A P G K D G L N G L P G P | | | | | |
| | 1151 | | | | 1161 |
| | | | | | |
| 3491 | 3501 | 3511 | 3521 | 3531. | . |
| ATTGGGCCCCCTGGTCTCGCGGTGCGCACTGGTGATGCTGGTCCTGTTgtatgtagcccc | | | | | |
| I G P P G P R G R T G D A G P V | | | | | |
| | 1171 | | | | |

.

tcatcccctctgctcatggccctccagccccaaagcacttggatgccgtaatccccac

.
tctcttccctctctgtgcag

Exon 48 | Start: 19718 | End: 20000 | Length: 282

.
tatgtagcccctcatcccctctgctcatggccctccagccccaaagcacttggatgccg

. |3541 |3551
gtaatccccactctcttccctctctgtgcagGGTCCCCCGGCCCTCCTGGACCTCCTGG
G P P G P P G P P G
|1181

|3561 |3571 |3581 |3591 |3601 |3611
TCCCCCTGGTCCTCCCAGCGCTGGTTTCGACTTCAGCTTCCTGCCCCAGCCACCTCAAGA
P P G P P S A G F D F S F L P Q P P Q E
|1191 |1201

|3621 |3631 |3641 |3651 |3661 |3671
GAAGGCTCAGGATGGTGGCCGCTACTACCGGGCTGATGATGCCAATGTGGTTCGTGACCG
K A H D G G R Y Y R A D D A N V V R D R
|1211 |1221

|3681 |3691 |3701 |3711 |3721 |3731
TGACCTCGAGGTGGACACCCCTCAAGAGCCTGAGCCAGCAGATCGAGAACATCCGGAG
D L E V D T T L K S L S Q Q I E N I R S
|1231 |1241

|3741 |3751 |3761 |3771 |3781 |3791
CCCAGAGGGCAGCCGCAAGAACCCCGCCCGCACCTGCCGTGACCTCAAGATGTGCCACTC
P E G S R K N P A R T C R D L K M C H S
|1251 |1261

|3801 |3811
TGA CTGGAAGAGTGgtgagggcctgccctagcctctccctccctcctactcctgccatgc
D W K S G
|1271

.
cagggtcccatgcccatatgtgccctaccatattggtgctggctgctccctttccctga

.
ctccatcttgccctgccctaccacag

Exon 49 | Start: 20133 | End: 20323 | Length: 190

.
tgagggcctgccctagcctctccctccctcctactcctgccatgccagggtcccatgcc

.
catatgtgcccctaccatatggtgctggctgctccctttccctgactccatcttgccctg

. |3821 |3831 |3841 |3851 |3861
ccctaccacagGAGAGTACTGGATTGACCCCAACCAAGGCTGCAACCTGGATGCCATCAA
E Y W I D P N Q G C N L D A I K
|1281

|3871 |3881 |3891 |3901 |3911 |3921
AGTCTTCTGCAACATGGAGACTGGTGAGACCTGCGTGTACCCCACTCAGCCCAGTGTGGC
V F C N M E T G E T C V Y P T Q P S V A
|1291 |1301

|3931 |3941 |3951 |3961 |3971 |3981
CCAGAAGAACTGGTACATCAGCAAGAACCCCAAGGACAAGAGGCATGTCTGGTTCGGCGA
Q K N W Y I S K N P K D K R H V W F G E
|1311 |1321

|3991 |4001
GAGCATGACCGATGGATTCCAGgtgcgtgagctggacctcagagccagtgttaggagatg
S M T D G F Q
|1331

.
ggctagcccagtgctcagaaggacatgaagtcctggagtaggtctctgctaagggtgat

.
ggacagagctgggctgggaggcaggggtctcaggtccctgatagtgggttcagacacaggc

.
tgccgatgggcaggtggtgcctcctctcgatataacggtgcattgggcagctctctgagg

.

accctggacagggaggccaggcaggactagaggttcccgcatagcggctcactcttccct

. . . .
ctctcccctcccctgcag

Exon 50 | Start: 20620 | End: 20862 | Length: 242

.
tgcgtgagctggacctcagagccagtgtaggagatgggctagcccagtgctcagaaggg

.
acatgaagtcctggagtaggtctctgctaagggtgatggacagagctgggctgggaggca

.
ggggctcaggtccctgatagtgggtcagacacaggctgccgatgggcaggtgggtgcctc

.
ctctcgatataacggtgcattgggcagctctctgaggaccctggacagggaggccaggca

.
ggactagaggttcccgcatagcggctcactcttccctctctcccctcccctgcagTTCGA
F E

| | | | | | |
|--|------|------|------|------|------|
| 4011 | 4021 | 4031 | 4041 | 4051 | 4061 |
| GTATGGCGGCCAGGGCTCCGACCCTGCCGATGTGGCCATCCAGCTGACCTTCCTGCGCCT | | | | | |
| Y G G Q G S D P A D V A I Q L T F L R L | | | | | |
| 1341 | | | | 1351 | |

| | | | | | |
|--|------|------|------|------|------|
| 4071 | 4081 | 4091 | 4101 | 4111 | 4121 |
| GATGTCCACCGAGGCCTCCCAGAACATCACCTACCACTGCAAGAACAGCGTGGCCTACAT | | | | | |
| M S T E A S Q N I T Y H C K N S V A Y M | | | | | |
| 1361 | | | | 1371 | |

| | | | | | |
|--|------|------|------|------|------|
| 4131 | 4141 | 4151 | 4161 | 4171 | 4181 |
| GGACCAGCAGACTGGCAACCTCAAGAAGGCCCTGCTCCTCCAGGGCTCCAACGAGATCGA | | | | | |
| D Q Q T G N L K K A L L L Q G S N E I E | | | | | |
| 1381 | | | | 1391 | |

| | | | | | |
|---|------|------|------|------|------|
| 4191 | 4201 | 4211 | 4221 | 4231 | 4241 |
| GATCCGCGCCGAGGGCAACAGCCGCTTCACCTACAGCGTCACTGTGATGGCTGCACGgt | | | | | |
| I R A E G N S R F T Y S V T V D G C T | | | | | |

|1401
 |1411

 gagtgcccagaatccccaggcagggccccacctctccggccttgggctttttggccaggc

 catagtgccctctctccatcactcccacgtggtaatgccccctcccgttgtctccgcccc

 accccagagtcacaccggagcctggggcaagacagtgattgaatacaaaaccaccaagac

 ctcccgctgcccacatcatgatgtggcccccttggaagtgtggcagaccaggaatt

 cggcttcgacgttggccctgtctgcttctgtaaactccctccatcccaacctggctc

Exon 51 | Start: 20992 | End: 22544 | Length: 1552

.
 tgagtgcccagaatccccaggcagggccccacctctccggccttgggctttttggccagg

 ccatagtgccctctctccatcactcccacgtggtaatgccccctcccgttgtctccgccc
 . . . |4251 |4261 |4271 |4281 |4291
 caccagAGTCACACCGGAGCCTGGGGCAAGACAGTGATTGAATACAAAACCACCAAGA
 S H T G A W G K T V I E Y K T T K T
 |1421 |1431
 |4301 |4311 |4321 |4331 |4341 |4351
 CCTCCCGCTGCCCATCATCGATGTGGCCCCCTTGGACGTTGGTGCCCCAGACCAGGAAT
 S R L P I I D V A P L D V G A P D Q E F
 |1441 |1451
 |4361 |4371 |4381 |4391|+1 |+11 |+21
 TCGGCTTCGACGTTGGCCCTGTCTGCTTCCTGTAAACTCCCTCCATCCCAACCTGGCTCC
 G F D V G P V C F L *
 |1461
 |+31 |+41 |+51 |+61 |+71 |+81
 CTCCCACCAACCAACTTTCCCCCAACCCGAAACAGACAAGCAACCAAACTGAACCC

| | | | | | |
|---|------|------|------|------|------|
| +91 | +101 | +111 | +121 | +131 | +141 |
| CCTCAAAAGCCAAAAAATGGGAGACAATTTACATGGACTTTGGAAAAATTTTTTTTCCT | | | | | |
| +151 | +161 | +171 | +181 | +191 | +201 |
| TTGCATTCACTCTCTCAAACCTTAGTTTTATCTTTGACCAACCGAACATGACCAAAAACCA | | | | | |
| +211 | +221 | +231 | +241 | +251 | +261 |
| AAAGTGCATTCAACCTTACCAAAAAAAAAAAAAAAAAAGAATAAATAAACTTTTTTA | | | | | |
| +271 | +281 | +291 | +301 | +311 | +321 |
| AAAAAGGAAGCTTGGTCCACTTGCTTGAAGACCCATGCGGGGGTAAGTCCCTTTCTGCCC | | | | | |
| +331 | +341 | +351 | +361 | +371 | +381 |
| GTTGGGCTTATGAAACCCCAATGCTGCCCTTTCTGCTCCTTTCTCCACACCCCCCTTGGG | | | | | |
| +391 | +401 | +411 | +421 | +431 | +441 |
| GCCTCCCCTCCACTCCTTCCCAAATCTGTCTCCCCAGAAGACACAGGAAACAATGTATTG | | | | | |
| +451 | +461 | +471 | +481 | +491 | +501 |
| TCTGCCCAGCAATCAAAGGCAATGCTCAAACACCCAAGTGGCCCCCACCCTCAGCCCGCT | | | | | |
| +511 | +521 | +531 | +541 | +551 | +561 |
| CCTGCCCCGCCAGCACCCCCAGGCCCTGGGGACCTGGGGTTCTCAGACTGCCAAAGAAG | | | | | |
| +571 | +581 | +591 | +601 | +611 | +621 |
| CCTTGCCATCTGGCGTCCCATGGCTCTTGCAACATCTCCCCTTCGTTTTTGAGGGGGTC | | | | | |
| +631 | +641 | +651 | +661 | +671 | +681 |
| ATGCCGGGGGAGCCACCAGCCCCTCACTGGGTTCGGAGGAGAGTCAGGAAGGGCCACGAC | | | | | |
| +691 | +701 | +711 | +721 | +731 | +741 |
| AAAGCAGAAACATCGGATTTGGGGAACGCGTGCAATCCCTTGTGCCGCAGGGCTGGGCG | | | | | |
| +751 | +761 | +771 | +781 | +791 | +801 |
| GGAGAGACTGTTCTGTTCTTGTGTAAGTGTGTTGCTGAAAGACTACCTCGTTCTTGCTCT | | | | | |
| +811 | +821 | +831 | +841 | +851 | +861 |
| TGATGTGTACACGGGGCAACTGCCTGGGGCGGGGATGGGGCAGGGTGGAAGCGGCTCC | | | | | |
| +871 | +881 | +891 | +901 | +911 | +921 |
| CCATTTTATACCAAAGGTGCTACATCTATGTGATGGGTGGGTGGGAGGGAATCACTGG | | | | | |
| +931 | +941 | +951 | +961 | +971 | +981 |
| TGCTATAGAAATTGAGATGCCCCCAGGCCAGCAAATGTTCCCTTTTTGTTCAAAGTCTA | | | | | |

|+991 |+1001 |+1011 |+1021 |+1031 |+1041
TTTTTATTCCTTGATATTTTCTTTTTTTTTTTTTTTTTTTTGTGGATGGGGACTTGTGAA

 |+1051 |+1061 |+1071 |+1081 |+1091 |+1101
TTTTTCTAAAGGTGCTATTTAACATGGGAGGAGAGCGTGTGCGGCTCCAGCCCAGCCCGC

 |+1111 |+1121 |+1131 |+1141 |+1151 |+1161
TGCTCACTTTCACCTCTCTCCACCTGCCTCTGGCTTCTCAGGCCTCTGCTCTCCGACC

 |+1171 |+1181 |+1191 |+1201 |+1211 |+1221
TCTCTCCTCTGAAACCTCCTCCACAGCTGCAGCCCATCCTCCCGGCTCCCTCCTAGTCT

 |+1231 |+1241 |+1251 |+1261 |+1271 |+1281
TGCTGCGTCTCTGTCCCCGGGTTTCAGAGACAACTTCCCAAAGCACAAAGCAGTTTTT

 |+1291 |+1301 |+1311 |+1321 |+1331 |+1341
CCCCCTAGGGGTGGGAGGAAGCAAAAGACTCTGTACCTATTTGTATGTGTATAATAATT

 |+1351 |+1361 |+1371 |+1381 |+1391 |+1401
TGAGATGTTTTTAATTATTTTGATTGCTGGAATAAAGCATGTGGAATGACCCAAACATA

Atccgcagtggcctcctaatttccttctttggagttgggggaggggtagacatggggaag

gggctttggggatgatgggcttgccctccattcctgcccctttccctccccactattctctt

ctagatccctccataacccccactcccctttctctcacccttcttataaccgcaaactttc

tacttcctctttcattttctattcttgcaatttccttgcaccttttccaaatcctcttct

cccctgcaataccatacaggcaatccacgtgcacaacacacacacactcttcacatct

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Writer: Version: 0.3, Version Date: 11/02/2015
Control: Version: 0.3, Version Date: 11/02/2015