Gene: EGFR - Sequence: NG_007726.3
Date : January 11, 2015

Exon 1 | Start: 1 | End: 334 | Length: 333


```
        .         .         .         .         .         .         .
ggaccgggtccagaggggcagtgctgggaacgcccctctcggaaattaactcctcagggc

        .         .         .         .         .         .         .
acccgctcccctcccatgcgccgcccactcccgccggagactaggtcccgcgggggcca

        .         .         .         .         .         .         .
ccgctgtccaccgcctccggcggccgctggccttgggtccccgctgctggttctcctccc

        .         .         .         .         .         .         .
tcctcctcgcattctcctcctcctctgctcctcccgatccctcctccgccgcctggtccc

        .         .         .         .         .         .         .
tcctcctcccgccctgcctcccccgcgcctcggcccgcgcgagctagacgtccgggcagcc

        |-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

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

1

```
cgccgcccccggatcgcgccccggaccccgcagcccgcccaaccgcgcaccggcgcaccg


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


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


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


    .     .     .     .     .     .     .     .
tccggcgccccgaaccgctcccaactttcttccc



Exon 2 | Start: 335 | End: 486 | Length: 151



    .     .     .     .     .     .     .     .     .     .     .     .
ttcaatgcattatagggacaagctatctcttattatgaattgcaccttatataaacttaa


    .     .     .     .     .     .     .     .     .     .     .     .
agatcttttatcacaaatttctttgctgtgtcctttagtgagaatttgtattatcagtca


    .     .     .     .     .     .     .     .     .     .     .     .
ctaaagctcactaagttagtaagctttgcgcccagatgacctgggcaggaatgggtgagt


    .     .     .     .     .     .     .     .     .     .     .     .
ctctgtgtggagagagtgaagaaactgctacccttaatacctggaccttgagggattgtt


    .     .     .     .     .     .     .     .     .     .     .     .
ttattttagttttttctgcatttctcagtatttcatgtgatatctgtctttttcttccagt
    |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                .     .     .     .     .
```

2

```
TGCAGAGGAATTATGATCTTTCCTTCTTAAAGgttggtgactttgattttcctacacaaa
  Q   R   N   Y   D   L   S   F   L   K
  |71


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

taaaattggagaaaatctaagtggagaaaggcctgggcagaattccacttgaagtgtgtt


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

tattttttgctatggcaatgacaagtcttacagagctacaaacgagagtttttatgagaaag


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

ccattttaccagctaatgtcaagtaataactagaaaaggatatcaaatagaaacaggcta


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

atctggagttccatgtcatcatagacactgacgtttatccctgaccattacctcagtcat


      .       .       .       .       .       .       .

gatgtgctgccatactcgctcttaaaaacttt



Exon 3 | Start: 487 | End: 670 | Length: 183



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

atttccattttcactggagagtgttgaaccccgtgaggcatgagagcacagtgttccaga


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

acaatgcttactgctcattatcacaggggtcaaaggctaacgtgcagggattgttgcaga


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

tcgtggacatgctgcctcctgtgtccatgactgcaatcgtctacctattttacagttgtt


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

gagcactcgtgtgcattagggttcaactgggcgtcctagggctccctggacccattttag


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

accttgagttcttgagttcctcaaaagagaaatcacgcatttatgttttctcttcttaga

|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
```

3

```
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


        .        .        .        .        .        .        .        .        .        .
ggctcccagcgagcttgtcactcaattccacctcggagaaggctttttatttttacccagt

        .        .        .        .        .        .        .        .        .        .
acacgtgcactgagtgccggctgtgtgtaagatactgcaggggaagttactgagaagatg

        .        .        .        .        .        .        .        .        .        .
gcagatactggaatgggaagatttaagcggggtaccagtgtttacatggacatgaaaaaa

        .        .        .        .        .        .        .        .        .        .
tactgagagatagtaagaaatcgtaaagattctgagtaaaagagagtatgaccaaacaag

        .
ctga



Exon 4 | Start: 671 | End: 805 | Length: 134



        .        .        .        .        .        .        .        .        .        .
catgcatatcatttatgctgtgaccactgactaaaccattctcttccttcctccccatat

        .        .        .        .        .        .        .        .        .        .
ttctaaatttctaatcattgctcaaagcccaattcagagaaaaccctagctcctccatgg

        .        .        .        .        .        .        .        .        .        .
caccatcattaacaattttatctggccgcccccgggaagttcactgggctaattgcggg

        .        .        .        .        .        .        .        .        .        .
actcttgttcgcaccatggcatctctttagcagaacataaatgcgaagagcacatgcatc
```

4

```
         .        .        .        .        .        .        .        .        .        .
      cttcatgggaatttaaaggagctggaaagagtgctcaccgcagttccattctcccgcaga

           |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: 806 | End: 874 | Length: 68



           .        .        .        .        .        .        .        .        .        .
      gcagattgtaaacaaggaacctcaaattcatgaaaaattcttgcttatgtggcccatgtc

           .        .        .        .        .        .        .        .        .        .
      agtaattactctctgcctcagtttccgcagctgacatgtaaataaaagcagttcatggtt
```

```
          .         .         .         .         .         .
catcttcttttcttatcggggtctcaagtgattctacaaaccagccagccaaacaatcag

          .         .         .         .         .         .
agaataagttgaaaagattgtcttcatttattgaatgtgcttaactcaggcccgggaaag

          .         .         .         .         .         .
ggcgtcatcagtttctcatcatttcactgagatatgcatctattacttttacatttcagg

 |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

          .         .         .         .         .         .
ggctgggcgcggtggctcaccccctataatcccagcactttgggaggcggaggcggtcgga

     .    .
tcacgaggt


Exon 6 | Start: 875 | End: 993 | Length: 118


          .         .         .         .         .         .
agcaggtattttgttctttgtatgtgctttctgcattgcccaagatgcatctaattatt

          .         .         .         .         .         .
tagcaggtctcaaagtctagacttgatctcatgagttctcttaagtgattaaaaataaat
```

```
         .         .         .         .         .         .         .         .         .         .
         caggagaaaaaagaggcaatcagaaaagggcatggtttgacttagtttgaatgtggtttc

         .         .         .         .         .         .         .         .         .         .
         gttggaagcaaatgtgtcttcactttttcatgaaaaagtctgcaagtgctctgcgacatc

         .         .         .         .         .         .         .         .         .         .
         cctgggaaatgatcctaccctcactcttcagctcacagggaacctttgctctttttcagt

          |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: 994 | End: 1135 | Length: 141


          .         .         .         .         .         .         .         .         .         .
         accgctataatgtgtgaactccatcatctatacgttagtaaacagacgtatttttatcat

          .         .         .         .         .         .         .         .         .         .
         aatccataaattatgataggtgggacagtgcacctaagaaaaaaatggactttttagaga
```

7

```
     .         .         .         .         .         .         .
   agggtctttctgactctgcagagggcgccagctgggtttttcccacactagtggaacacta

     .         .         .         .         .         .         .
   ggctgcaaagacagtaacttgggctttctgacgggagtcaacaccgtgctgcgcttcctc

     .         .         .         .         .         .         .
   cgtgtgtggcgctgagtgtacttacctcacttgcccagcgtgtcctctctcctccatagg

      |751       |761       |771       |781       |791       |801
   GTCTGCCGCAAATTCCGAGACGAAGCCACGTGCAAGGACACCTGCCCCCCCACTCATGCTC
   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: 1136 | End: 1252 | Length: 116


     .         .         .         .         .         .         .
```

```
ggtggaggagagggctgaggtgcctgctgggacgcaaaacagctggcccctcaagggacc

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

cagtgtttcctgccatgatgaaacacctgtattgtccacattgcggcctagaatgttatt

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

aaactcttgaacgggattccttctctatttgcaacctttcattctttgtccttaaagtaa

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

ataaagccaaaggaggatggagcctttccatcacccctcaagaggacctggaccgcctgt

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

gtgaggcccgagcacctggtgccaccgtcatcaccttccttcatgctctctcttcccagg

 |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

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

gacggggtggggggctctgatgagaacagtcacagagccagccccgctcagcagctgcca

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

ggtgcccagccctggggagaatccagggaaggcagagctggaagcagtgcagctcca


Exon 9 | Start: 1253 | End: 1379 | Length: 126


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

```
cagtgcagctccaagcggcccatgggaaataatgaggagaacgcaaggtcagtgtgaggt

    .         .         .         .         .         .
gacagggatggcatctcctacaccgccgtagcccccaaagtgtactataggtcctggtgtc

    .         .         .         .         .         .
cccccttcccgcctgcactctccccagcccettcagtgtttgttgagtgaatgaaggatg

    .         .         .         .         .         .
atgtggcagtggcggttccggtgaccggaattccttcctgcttccctctgcctgtggatc

    .         .         .         .         .         .
cctagctattcttaatccaacaaatgtgaacggaatacacgtctctcttatctctgcagt

    |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
TTAAACACTTCAAAAAACTGCACCTCCATCAGTGGCGATCTCCACATCCTGCCGGTGGCAT
  K   H   F   K   N   C   T   S   I   S   G   D   L   H   I   L   P   V   A   F
              |361                              |371

    |1131     .         .         .         .         .         .
TTAGGGGgtgagtcacaggttcagttgcttgtataaagaaaaacaaaatctgcctttttta
  R   G


    .         .         .         .         .         .
actggtagagattggtgatcaataatcaccctgttgtttgtttcagtgactccttcacac

    .         .         .         .         .         .
atactcctcctctggatccacaggaactggatattctgaaaaccgtaaaggaaatcacag

    .         .         .         .         .         .
gtttgagctgaattatcacatgaatataaatgggaaatcagtgttttagagagagaactt

    .         .         .         .         .         .
ttcgacatatttcctgttcccttggaataaaaacatttcttctgaaattttaccgttaat

    .         .
ggctgat
```

Exon 10 | Start: 1380 | End: 1453 | Length: 73

```
     .     .     .     .     .     .     .     .     .     .     .     .
tctgcctgtggatccctagctattcttaatccaacaaatgtgaacggaatacacgtctct

     .     .     .     .     .     .     .     .     .     .     .     .
cttatctctgcagtgtgtaacggaataggtattggtgaatttaaagactcactctccata

     .     .     .     .     .     .     .     .     .     .     .     .
aatgctacgaatattaaacacttcaaaaactgcacctccatcagtggcgatctccacatc

     .     .     .     .     .     .     .     .     .     .     .     .
ctgccggtggcatttagggggtgagtcacaggttcagttgcttgtataaagaaaaacaaa

     .     .     .     .     .     .     .     .     .     .     .     .
atctgcctttttaactggtagagattggtgatcaataatcaccctgttgtttgtttcagt

        |1141        |1151        |1161        |1171        |1181        |1191
TGACTCCTTCACACATACTCCTCCTCTGGATCCACAGGAACTGGATATTCTGAAAACCGT
 D   S   F   T   H   T   P   P   L   D   P   Q   E   L   D   I   L   K   T   V
        |381                              |391

        |1201        .     .     .     .     .     .     .     .     .
AAAGGAAATCACAGgtttgagctgaattatcacatgaatataaatgggaaatcagtgttt
 K   E   I   T   G
        |401

     .     .     .     .     .     .     .     .     .     .     .     .
tagagagagaacttttcgacatatttcctgttcccttggaataaaaacatttcttctgaa

     .     .     .     .     .     .     .     .     .     .     .     .
attttaccgttaatggctgatgttttgatattttttcaaaagtgcagtttctcctgcaggc

     .     .     .     .     .     .     .     .     .     .     .     .
aaaaggggacacgttaagtccaggcttgggtcattcactgcggtgtaaacacgctttctc

     .     .     .     .     .     .     .     .     .     .     .     .
cctcccgcccggccccagccagctgccttggtggcccataacccctgagggtagagggag

     .     .     .
gggacaggggtagg
```

11

Exon 11 | Start: 1454 | End: 1544 | Length: 90


```
      .         .         .         .         .         .         .         .         .         .         .
agcctcttcgggttaatcagatacgcggcgcagcaggggtctcagggccacagccaggggg

      .         .         .         .         .         .         .         .         .         .         .
ggcggcgggagacatgcggaatcgcagcggaaggcgggaggcagctgtgaactgtggctc

      .         .         .         .         .         .         .         .         .         .         .
ggcctgcgtccgccctgcgcatgtacactcagagaagatgataatgaaaaagaaagcaaa

      .         .         .         .         .         .         .         .         .         .         .
tccaattttcccacttactgttcatataatacagagtccctgagagtctagagtaatgtc

      .         .         .         .         .         .         .         .         .         .         .
tcatacaaaaaagaaactcctacgtggtgtgtgtctgaagtctttcatctgccttacagg

    |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


      .         .         .         .         .         .         .         .         .         .         .
attacatttgccttttttagttggaaattaggcttaacaggagagttgctaagatagggca

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

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

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

      .         .         .         .         .         .
ttttcagtccatttctaacctatattagctc
```

Exon 12 | Start: 1545 | End: 1744 | Length: 199

```
         .       .       .       .       .       .       .       .       .       .       .       .
tcaatttccaggcaaaatgaaaatggagaaaatataatgacattaaggcattttattcat

         .       .       .       .       .       .       .       .       .       .       .       .
cctccccatctgccactgggttaaagatactaaataaacaaggaactatcttttgcctgg

         .       .       .       .       .       .       .       .       .       .       .       .
aggaactttaaaaacacctgcagttttcaaaaggtgcagtgtgtgcctcccacagcatga

         .       .       .       .       .       .       .       .       .       .       .       .
cctaccatcattggaaagcagtttgtagtcaatcaaaggtggtctggagaaacaaagttt

         .       .       .       .       .       .       .       .       .       .       .       .
tcagggatacattgttttttataattttttcaccacatgattttttcttctctccaatgtagt

   |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
TACAATAAACTGGAAAAAAACTGTTTGGGACCTCCGGTCAGAAAACCAAAATTATAAGCAA
 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

         .       .       .       .       .       .       .       .       .       .       .       .
aatgggtcctttatttgtatttagaatattgaagggctattcccatttaaattactttttt

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

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

```
attccattaaaactttttccagatcattaccattcaatgggatgaatttaccctgaggtt


    .       .       .       .       .       .       .       .       .       .
taggctaccaattatttgtaatgtaagtaactaaatttagtattagttatattacctttt


    .       .       .       .
agttgtaggtcactctctgc
```

Exon 13 | Start: 1745 | End: 1877 | Length: 132

```
    .       .       .       .       .       .       .       .       .       .       .
ggactcacggcacccctctcgggtgccagggtgcctggctcccaccaggaggaagacct

    .       .       .       .       .       .       .       .       .       .       .
gtcctccactgtcaggcacatttcagtcttcccagcagccagcacaactactttgtcctt

    .       .       .       .       .       .       .       .       .       .       .
ccagtcacggtcggcctctgggaagcccagtctgtgtcctcctccttcaggggtagccag

    .       .       .       .       .       .       .       .       .       .       .
catgtctgtgtcacccaaggtcatggagcacagggcccctcccgggaaggtgccgtctcc

    .       .       .       .       .       .       .       .       .       .       .
tccggcccctcgggtccctgctctgtcactgactgctgtgacccactctgtctccgcaga

   |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
```

14

```
        .        .        .        .        .        .        .        .        .        .        .        .
    tgcccttggcttttggaggttttgggttttctgtggggagacgggaagttgtttgattgc

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

        .        .        .        .        .        .        .        .        .        .        .        .
    ccaataatttatagaatctcttttcctggaagtatcttaaattttttctaagctacaaaaa

        .        .        .
    gttcctaagacaa


Exon 14 | Start: 1878 | End: 1968 | Length: 90


        .        .        .        .        .        .        .        .        .        .        .        .
    acacctcctcaggactatcttttcttttatcatttggcttgcttacccaatatgcaaaaa

        .        .        .        .        .        .        .        .        .        .        .        .
    ctatgctgtagaaaaagcagaaaagatatcttgattatgaatgaagctcctgtgtttact

        .        .        .        .        .        .        .        .        .        .        .        .
    cagagagaagatgacccaggattcagttaacaaaatcagctgattatattactatatagt

        .        .        .        .        .        .        .        .        .        .        .        .
    cctggagtcccaactccttgaccattacctcaagttatttggaattttgaagaggtgatt

        .        .        .        .        .        .        .        .        .        .        .        .
    tgtgttcctgcaataatgtctcaggggtgggctgacgggtttcctcttcctcctctcagt
              |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
```

15

```
        .         .         .         .         .         .         .         .         .         .         .         .
        tgggcaggacggccatcagagccacttcccagaggagacggcaggcgctgacagcgctgt

        .         .         .         .         .         .         .         .         .         .         .         .
        ccgggcagggtgtcggtgacattagcacacacattagcctgcgatgaacattcactctttt

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

        .         .         .         .         .         .         .
        ttcacctggtttcccccatccctgacctagt
```

Exon 15 | Start: 1969 | End: 2126 | Length: 157

```
        .         .         .         .         .         .         .         .         .         .         .         .
        ttttgccaaggaaagatgcccacaatggttaagcagaatgcaataatgtagagaatatca

        .         .         .         .         .         .         .         .         .         .         .         .
        tttctttcatgctggtgtatatcatatgcattcaaaaacagggagaacttctaagcaact

        .         .         .         .         .         .         .         .         .         .         .         .
        aacagtgaccatatcaagcaggtgcaatcacagaataactggttttctcctttaagaatt

        .         .         .         .         .         .         .         .         .         .         .         .
        tttctatcatttggctttcccccactcacacacactaaatattttaagtaaaaagttactt

        .         .         .         .         .         .         .         .         .         .         .         .
        ccattttgaaagagaaaagaaagagacatgcatgaacatttttctccaccttggtgcagg

             |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
```

16

```
H V C H L C H P N C T Y G
              |621


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


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


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


      .     .     .     .     .     .     .     .     .     .     .     .
cgtgtccccggccgggcctgtgttgtgcaatgctgcacatcacaacaggagggtaggggg


      .     .     .     .     .     .     .     .
acaaaagagcacaggtcctggcagctgccacagtctcc



Exon 16 | Start: 2127 | End: 2165 | Length: 38



      .     .     .     .     .     .     .     .     .     .     .     .
attatctgtgtcaaaagccagatgtgaaaacatctcaataacaaactggctgctttgttc


      .     .     .     .     .     .     .     .     .     .     .     .
aatgctagaacaacgcctgtcacagagtagaaactcaaaaatatttgctgagtgaatgaa


      .     .     .     .     .     .     .     .     .     .     .     .
caaatgaataaatgcataataaataattaaccaccaatccaacatccagacacatagtga


      .     .     .     .     .     .     .     .     .     .     .     .
ttttaattatttaagagtagtttagcatatattgctttatgatttaattaaaaatctcca


      .     .     .     .     .     .     .     .     .     .     .     .
aaatatatgccaaagaagtagaatgagaaaaatgtatatttctctttcacttcctacaga

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


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


                                   17
```

```
       .         .         .         .         .         .         .         .         .         .         .         .
ctgactgtcctctgtcctgatcaagtttctatggctctgggccagcctaccctcagccag

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

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

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

Exon 17 | Start: 2166 | End: 2307 | Length: 141

```
       .         .         .         .         .         .         .         .         .         .         .         .
catattttgttaatcaacaaattgaaaaatactcattatatggagaggtccagataaagc

       .         .         .         .         .         .         .         .         .         .         .         .
ctcaattttaaaaaatgaggaaaagtgtgcctggtaggggactggggagagcttgagaaa

       .         .         .         .         .         .         .         .         .         .         .         .
gttggaaacgttgccttagaagcctgttttttctccttttagaagctacatagtgtctca

       .         .         .         .         .         .         .         .         .         .         .         .
ctttccaagatcattctacaagatgtcagtgcactgaaacatgcaggggcgtgttgagtg

       .         .         .         .         .         .         .         .         .         .         .         .
ccaaggccatggaatctgtcagcaacctcacccttccttgttcctccacctcattccagg

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

18

```
 R  L  L  Q  E  R  E
 |681


 .    .    .    .    .    .    .    .    .    .    .    .
ccccgacaggaacaagggccagcccccgagaacgggccattagcagttgtgtatgttagat


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


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


 .    .    .    .    .    .    .    .    .    .    .    .
acaaagctgtgtggcatctgcttaggacccggtgcctgtgtgtgcataggagggaggcca


 .    .    .    .    .    .
ggaagcctggctgttgatccca




Exon 18 | Start: 2308 | End: 2430 | Length: 122



 .    .    .    .    .    .    .    .    .    .    .    .
cctaccggagttttcaatccagttaataggcgtggaaacagacatagaaattgtgtttgt


 .    .    .    .    .    .    .    .    .    .    .    .
tgaaaggtagctgttcagttaaagaacacctgtatcagagcctgtgtttctaccaacttc


 .    .    .    .    .    .    .    .    .    .    .    .
tgtcaagctctgtagagaaggcgtacatttgtccttccaaatgagctggcaagtgccgtg


 .    .    .    .    .    .    .    .    .    .    .    .
tcctggcacccaagcccatgccgtggctgctggtccccctgctgggccatgtctggcact


 .    .    .    .    .    .    .    .    .    .    .    .
gctttccagcatggtgagggctgaggtgacccttgtctctgtgttcttgtcccccccagc


        |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: 2431 | End: 2529 | Length: 98



        .       .       .       .       .       .       .       .       .       .
taggcctagacgcagcatcattaaattctggatgaaatgatccacacggactttataaca

        .       .       .       .       .       .       .       .       .       .
ggctttacaagcttgagattcttttatctaaataatcagtgtgattcgtggagcccaaca

        .       .       .       .       .       .       .       .       .       .
gctgcagggctgcggggggcgtcacagcccccagcaatatcagccttaggtgcggctccac

        .       .       .       .       .       .       .       .       .       .
agccccagtgtccctcaccttcggggtgcatcgctggtaacatccacccagatcactggg

        .       .       .       .       .       .       .       .       .       .
cagcatgtggcaccatctcacaattgccagttaacgtcttccttctctctctgtcatagg

        |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


           .        .        .        .        .        .        .        .        .        .        .        .
       tgggggtccatggctctgaacctcaggcccaccttttctcatgtctggcagctgctctgc

           .        .        .        .        .        .        .        .        .        .        .        .
       tctagaccctgctcatctccacatcctaaatgttcactttctatgtcttttccctttctag

           .        .        .        .        .        .        .        .        .        .        .        .
       ctctagtgggtataactccctccccttagagacagcactggcctctcccatgctggtatc

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

           .        .        .        .        .        .        .        .        .        .
       cgcatgatgagtgagtgctcttggtgagcctggagcatg



       Exon 20 | Start: 2530 | End: 2715 | Length: 185



           .        .        .        .        .        .        .        .        .        .        .        .
       ggtgactccgactcctcctttatccaatgtgctcctcatggccactgttgcctgggcctc

           .        .        .        .        .        .        .        .        .        .        .        .
       tctgtcatgggggaatccccagatgcacccaggaggggccctctcccactgcatctgtcac

           .        .        .        .        .        .        .        .        .        .        .        .
       ttcacagccctgcgtaaacgtccctgtgctaggtcttttgcaggcacagcttttcctcca

           .        .        .        .        .        .        .        .        .        .        .        .
       tgagtacgtattttgaaactcaagatcgcattcatgcgtcttcacctggaaggggtccat

           .        .        .        .        .        .        .        .        .        .        .        .
       gtgcccctccttctggccaccatgcgaagccacactgacgtgcctctccctccctccagg

           |2291      |2301      |2311      |2321      |2331      |2341
       GAAGCCTACGTGATGGCCAGCGTGGACAACCCCCACGTGTGCCGCCTGCTGGGCATCTGC
```

21

```
      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

              .         .         .         .         .         .         .         .
      cagcacacacacattcctttattttggattcaatcaagttgatcttcttgtgcacaaatc

              .         .         .         .         .         .         .         .
      agtgcctgtcccatctgcatgtggaaactctcatcaatcagctacctttgaagaattttc

              .         .         .         .         .         .         .         .
      tctttattgagtgctcagtgtggtctgatgtctctgttcttatttctctggaattctttg

              .         .
      tgaata
```

Exon 21 | Start: 2716 | End: 2871 | Length: 155

```
              .         .         .         .         .         .         .         .
      agttcaagcccaggtctcaactgggcagcagagctcctgctcttctttgtcctcatatac

              .         .         .         .         .         .         .         .
      gagcacctctggacttaaaacttgaggaactggatggagaaaagttaatggtcagcagcg

              .         .         .         .         .         .         .         .
```

```
ggttacatcttctttcatgcgcctttccattctttggatcagtagtcactaacgttcgcc


 .     .     .     .     .     .     .     .     .     .     .
agccataagtcctcgacgtggagaggctcagagcctggcatgaacatgaccctgaattcg


 .     .     .     .     .     .     .     .     .     .     .
gatgcagagcttcttcccatgatgatctgtccctcacagcagggtcttctctgtttcagg


 |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: 2872 | End: 2947 | Length: 75



 .     .     .     .     .     .     .     .     .     .     .
gggccctgaaaacacacgcagacctggatgagtgaggccactgggcacaaccagggctcc
```

```
       .        .        .        .        .        .        .        .        .        .        .        .
       cagctcaccagagcagcctgggacacagagggtgctcagaaacctaccagagcagccctg

       .        .        .        .        .        .        .        .        .        .        .        .
       aactccgtcagactgaaatcccctgttgccgggaggaggcgccgggcctgggggacgggt

       .        .        .        .        .        .        .        .        .        .        .        .
       cctggggtgatctggctcgtctgtgtgtgtcactcgtaattaggtccagagtgagttaac

       .        .        .        .        .        .        .        .        .        .        .        .
       tttttccaacagagggaaactaatagttgtctcactgcctcatctctcaccatcccaagg

           |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

       .        .        .        .        .        .        .        .        .        .        .        .
       ctggctttttattgttagttaatttacattatatcctctgacatgcaagtattttctttcg

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

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

       .        .        .        .        .        .        .        .        .        .        .        .
       ggcagggtggggggtatgggagggaaagagcttaggaaacggctctccctgcaaagtcca

       .        .        .        .        .
       accaaactttaacgtt


Exon 23 | Start: 2948 | End: 3094 | Length: 146


       .        .        .        .        .        .        .        .        .        .        .        .
       ttaattaccaaagtttaccacttatcagtcacttactacttgctgggcattgcactaagc
```

24

```
        .         .         .         .         .         .
atttcagttgtattatcttgttgggtccttacagcaatcctgtgaaacagatactgctat

        .         .         .         .         .         .
taccccactttatagagaggtagactgaggcttccagcattgaagcaaattgcccaagac

        .         .         .         .         .         .
tacagaaatgtaggtttctaaacatcaagaaacagtaaccagtaatgatgactaaagcaa

        .         .         .         .         .         .
gggattgtgattgttcattcatgatcccactgccttcttttcttgcttcatcctctcagg

         |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: 3095 | End: 3192 | Length: 97
```

```
       .        .        .        .        .        .        .        .        .        .        .        .
agacccacactgctccatcccctcaggcgtaacacaggatgctgaccccaggaagagtgg

       .        .        .        .        .        .        .        .        .        .        .        .
gcgtagaaaaactagagggcattattgttattctgattcaaatgtacagtgctggcatgg

       .        .        .        .        .        .        .        .        .        .        .        .
tctttaaacagtaaccagtactagctggccaagacagaaaagtctaccacaaagacttgg

       .        .        .        .        .        .        .        .        .        .        .        .
ttctttcatcacttatttgactggaagtgtcgcatcaccaatgccttctttaagcaatgc

       .        .        .        .        .        .        .        .        .        .        .        .
catctttatcatttcttccagtgttctaattgcactgtttttttctcattccttccccagg

   |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: 3193 | End: 3360 | Length: 167
```

```
         .         .         .         .         .         .         .         .         .         .         .         .
acagcaaggtgcacactcgatgaatgctgcagcttcttccctttctgtttcctcagaagc

         .         .         .         .         .         .         .         .         .         .         .         .
tatttgaatctcatgtaggggctttcaagcatcaaaggatggttcatgtttattttaag

         .         .         .         .         .         .         .         .         .         .         .         .
gcacccacatcatgtcatgaggggaggcagctataatttagagaaccaaggggggatttca

         .         .         .         .         .         .         .         .         .         .         .         .
ttataacaaaattggcaaacacacaggcacctgctggcaatagacccctgctcctatagc

         .         .         .         .         .         .         .         .         .         .         .         .
caagaagtggaatagcatctctacgggccattctaatagcctcaaaatctctgcaccagg

       |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

         .         .         .         .         .         .         .         .         .         .         .         .
cctttttaggtccactatggaatgtaattaaatcaaaactaaacctagttgctctaaaact

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

aacgattaagacaaaaattaaacaccttcacaatataccctccatgag

Exon 26 | Start: 3361 | End: 3408 | Length: 47


```
      .    .    .    .    .    .    .    .    .    .    .    .
ctagtgaaactcacatggatatgaagtcaattttaaccaaatggtaaaatcaaaatcaaa

      .    .    .    .    .    .    .    .    .    .    .    .
ataaattaagtgtattaattattttgttgcattgcaacaacttgattgtaagcctttttag

      .    .    .    .    .    .    .    .    .    .    .    .
gtccactatggaatgtaattaaatcaaaactaaacctagttgctctaaaactaacgatta

      .    .    .    .    .    .    .    .    .    .    .    .
agacaaaaattaaacaccttcacaatataccctccatgaggcacaccacctgcattcagg

      .    .    .    .    .    .    .    .    .    .    .    .
aaaagtggatgagatgtggtacaagcattccatgggcaacttctctgtttctttttcaga

        |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

      .    .    .    .    .    .    .    .    .    .    .    .
taacctaaataattttaacccagataatcttgagttttcttcctgtgtgggttttttccct

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

      .    .    .    .    .    .    .    .    .    .    .    .
cgcctggccttgttagaaacgccattttttcaggccactgccccagtttgaccaaatcagg

      .    .    .    .    .    .    .    .    .    .    .
acctctgggggtggcacccagtagtctatgtttgagccactttccagg
```


Exon 27 | Start: 3409 | End: 3517 | Length: 108

28

```
           .         .         .         .         .         .
tcacacatgtgaagtgtccagtagccacacgtggctagtggtgaccgtattgaagagcac

           .         .         .         .         .         .
cgctcatagcacacctccctcactgcggaaagttctgctgtacagcacccagcacagccc

           .         .         .         .         .         .
tgctgcccaccctgcagcctgtggcccagtagcaccagcacccaccagggtgcagactct

           .         .         .         .         .         .
caggcctgcccaacctactaatcagaaccagcatctcaaggagatctcgggtgatttttg

           .         .         .         .         .         .
caaacactgaagttggggcagccctgaccggagtaaccttccctcatttcctcctgcagc

        |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: 3518 | End: 5600 | Length: 2082
```

```
       .        .        .        .        .        .        .        .        .        .        .        .
       cacatcacacatatatgtatacatgcatacacatacacacacacatacacacactctcct

       .        .        .        .        .        .        .        .        .        .        .        .
       caaggcagtttatcctctgagaactttaaatttacaaaagacacatatgtccattacttt

       .        .        .        .        .        .        .        .        .        .        .        .
       gagaaggacaggaaagaacccactttcttttgcagcaacagcaagagggccctcccgagg

       .        .        .        .        .        .        .        .        .        .        .        .
       ctcctgctccctgtcataagtctccttgttgaggacattcacagggttcagaacccaggg

       .        .        .        .        .        .        .        .        .        .        .        .
       atcctgcatgggatggtgctttgctgattacttcacctctgatttctttccactttcaga

              |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  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  *
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30

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       |+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
TGTCCCTTTGAGCAGAAATTTATCTTTCAAAGAGGTATATTTGAAAAAAAAAAAAAGTAT

       |+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
```

31

```
   |+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
AATCTCCTTTAGCCATCACCCCAACCCCCCAAAATTAGTTTGTGTTACTTATGGAAGATA

   |+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         .       .       .
TTTTTGTCTCAATGAAAATAAAACTATATTCATTTCCACTCTAttatgctctcaaatacc


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

```
cctaagcatctatactagcctggtatgggtatgaaagatacaaagataaataaaacatag

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

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

    .         .         .         .         .         .         .         .         .         .         .         .
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    .         .         .         .         .         .         .         .         .
gtctcagtcagcggggaggtggaaagtgcaggtgcatcagggg
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