Gene: ABL1 - Sequence: NG_012034.1
Transcript: NM_005157.4 - Protein: NP_005148.2
Date : February 20, 2015

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

```
Exon 2 | Start: 126564 | End: 126645 | Length: 81

.    .    .    .    .    .    .    .    .    .    .    .
cgggaacgccaggggccccctgggtgcggacgggcgcggccaggaggggttaaggcgcag

.    .    .    .    .    .    .    .    .    .    .    .
gcggcggcggggcgggggcgggcctggcgggcgccctctccgggccctttgttaacaggc

.    .    .    .    .    .    .    .    .    .    .    .
gcgtcccggccaggcggagacgcggccgcggccatgggcgggcgcgggcgcgcggggcgg

.    .    .    .    .    .    .    .    .    .    .    .
cggtgagggcggctggcggggccgggggcgccgggggggcgcgcgggccgagccgggcct

.    .    .    .    .    .    .    .    .    .    .    .
gagccgggcccgcggaccgagctgggagaggggttccggcccccgacgtgctggcgcggg

   |1        |11       |21       |31       |41       |51
AAAATGTTGGAGATCTGCCTGAAGCTGGTGGGCTGCAAATCCAAGAAGGGGCTGTCCTCG
    M  L  E  I  C  L  K  L  V  G  C  K  S  K  K  G  L  S  S
    |1                          |11

   |61       |71          .    .    .    .    .    .    .
TCCTCCAGCTGTTATCTGGAAGgtaagcccgggccgcacgggttgggctgagtagccgcg
 S  S  S  C  Y  L  E
    |21

 .    .    .    .    .    .    .    .    .    .    .    .
cgccctcccgctgctgctgggcccttcctaggcctcgccgcccgcgcgctcccgcctgcg

 .    .    .    .    .    .    .    .    .    .    .    .
ccctccccgggtcttgtctttttttttctttcttccctcttctcttctcttctcttcagtt

 .    .    .    .    .    .    .    .    .    .    .    .
ctcttatattctgtctctctttctttctctctgtgtctgtctcttttctcttctcttgtc
```

```
 .    .    .    .    .    .    .    .    .    .    .    .
tctctctttttctctctctctgtctctttctctttctcgcgatggcccctaggcgccgcc

 .    .    .    .    .
ggcggagcgtggcccccagccc
```

Exon 3 | Start: 145184 | End: 145357 | Length: 173

```
.    .    .    .    .    .    .    .    .    .    .    .
tggatagactgttttaatttgactaaagtcatattgaatccatgaattttagaagctcaa

.    .    .    .    .    .    .    .    .    .    .    .
actattggggaacaataattaccaccttggagtgaaaatacttaatttccacaagattta

.    .    .    .    .    .    .    .    .    .    .    .
gtaaaggaagagtttttttaaaaaccaccttaatgataatagtatgtacagatgttaagaa

.    .    .    .    .    .    .    .    .    .    .    .
atgaaataggaatgtgtaatgttggaaacacaaatatttttgcttctgagaataaaacta

.    .    .    .    .    .    .    .    .    .    .    .
atttttttctcccaattttctcttccttttttctttttttctgttccccccttttctcttccag

 |81       |91       |101      |111      |121      |131
AAGCCCTTCAGCGGCCAGTAGCATCTGACTTTGAGCCTCAGGGTCTGAGTGAAGCCGCTC
E  A  L  Q  R  P  V  A  S  D  F  E  P  Q  G  L  S  E  A  A
            |31                          |41

 |141      |151      |161      |171      |181      |191
GTTGGAACTCCAAGGAAAACCTTCTCGCTGGACCCAGTGAAAATGACCCCAACCTTTTCG
R  W  N  S  K  E  N  L  L  A  G  P  S  E  N  D  P  N  L  F
            |51                          |61

 |201      |211      |221      |231      |241      |251    .
TTGCACTGTATGATTTTGTGGCCAGTGGAGATAACACTCTAAGCATAACTAAAGgtaaaa
V  A  L  Y  D  F  V  A  S  G  D  N  T  L  S  I  T  K
            |71                          |81

   .    .    .    .    .    .    .    .    .    .    .    .
gggttgtgggcagctagtggtggttgcaggagatagaaatctgggaattgcggtttgacc

   .    .    .    .    .    .    .    .    .    .    .    .
taccacccttgctcgttaaaggagcagctttgaaatctggactgcagggatatccaaaa
```

```
   .    .    .    .    .    .    .    .    .    .    .    .
caacaactgcatgtttctaagggagtcgactctccttagaggagttcttgtacaatagcc

   .    .    .    .    .    .    .    .    .    .    .    .
ctgggcaaaaacagaacttgccctatttttttatactgaaaaggacagctggacaaaatac

   .    .    .    .    .    .    .    .    .    .    .
tgaacgcaatttttcccctaagaaaaagcattatttccctaaaatgtcttatat
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Exon 4 | Start: 145921 | End: 146216 | Length: 295

```
.    .    .    .    .    .    .    .    .    .    .    .
ctaagaaaaagcattatttccctaaaatgtcttatattaggaacagagcacttgaataaa

.    .    .    .    .    .    .    .    .    .    .    .
cataattgatttataaaaactgaggctatacacttacctatctgttcagtacaaacagga

.    .    .    .    .    .    .    .    .    .    .    .
agcttcaaatgtaaacgtgaattctcatacacttataaatgcatatctttatgtggactt

.    .    .    .    .    .    .    .    .    .    .    .
gttaaaatgaaattggtatttaggaatttggagatttttagtagttacacaagaatcaat

.    .    .    .    .    .    .    .    .    .    .    .
gaaaaagaacgaagctggtttccaaagctgatatgtctgatttggttcctttcttctcag

       |261      |271      |281      |291      |301      |311
GTGAAAAGCTCCGGGTCTTAGGCTATAATCACAATGGGGAATGGTGTGAAGCCCAAACCA
G  E  K  L  R  V  L  G  Y  N  H  N  G  E  W  C  E  A  Q  T
                  |91                          |101

       |321      |331      |341      |351      |361      |371
AAAATGGCCAAGGCTGGGTCCCAAGCAACTACATCACGCCAGTCAACAGTCTGGAGAAAC
K  N  G  Q  G  W  V  P  S  N  Y  I  T  P  V  N  S  L  E  K
                  |111                         |121

       |381      |391      |401      |411      |421      |431
ACTCCTGGTACCATGGGCCTGTGTCCCGCAATGCCGCTGAGTATCTGCTGAGCAGCGGGA
H  S  W  Y  H  G  P  V  S  R  N  A  A  E  Y  L  L  S  S  G
                  |131                         |141

       |441      |451      |461      |471      |481      |491
TCAATGGCAGCTTCTTGGTGCGTGAGAGTGAGAGCAGTCCTGGCCAGAGGTCCATCTCGC
```

```
I  N  G  S  F  L  V  R  E  S  E  S  S  P  G  Q  R  S  I  S
                  |151                        |161

       |501      |511      |521      |531      |541
TGAGATACGAAGGGAGGGTGTACCATTACAGGATCAACACTGCTTCTGATGGCAAGgtag
L  R  Y  E  G  R  V  Y  H  Y  R  I  N  T  A  S  D  G  K
                  |171                        |181

.    .    .    .    .    .    .    .    .    .    .    .
gggacccttggcaggggcgctgatgggcccagggcaggggaaccagaggtcctgctgtc

.    .    .    .    .    .    .    .    .    .    .    .
ggattgataaattattgcaagaaagctcaaccaagaagatgtttaaagaatctttcaggt

.    .    .    .    .    .    .    .    .    .    .    .
gggagtcattccattagccttatgaagacccttattgaggatccgttctgtgatattac

.    .    .    .    .    .    .    .    .    .    .    .
aagttcctgggactggtatgattctcttattgtcttgctagagttttgttgttagcaagt

.    .    .    .    .    .    .    .    .    .    .    .
tacttaaaataggaggaatatctgttgggttttggacacatttttacaataagat
```

Exon 5 | Start: 153883 | End: 154155 | Length: 272

```
.    .    .    .    .    .    .    .    .    .    .    .
gaacgggaagcgagaactgggcacggaagatgagggagtgggagatttcaggcagaggga

.    .    .    .    .    .    .    .    .    .    .    .
gcagcagcaggtacagaggccctgaggccttttattgtgtctttttgcttgagcgagtaa

.    .    .    .    .    .    .    .    .    .    .    .
cttagagcacacgtagagaaagacagcagaagtgatcttctaaacactctgtcctgtgtg

.    .    .    .    .    .    .    .    .    .    .    .
gagagctccttatgtgagattttgctgtgtagtgaattaaggctcagccaaactggctca

.    .    .    .    .    .    .    .    .    .    .    .
cgtgagctctttgagcttgcctgtctctgtgggctgaaggctgttccctgtttccttcag

 |551      |561      |571      |581      |591      |601
CTCTACGTCTCCTCCGAGAGCCGCTTCAACACCCTGGCCGAGTTGGTTCATCATCATTCA
 L  Y  V  S  S  E  S  R  F  N  T  L  A  E  L  V  H  H  H  S
                     |191                       |201
```

```
 |611      |621      |631      |641      |651      |661
ACGGTGGCCGACGGGCTCATCACCACGCTCCATTATCCAGCCCCAAAGCGCAACAAGCCC
 T  V  A  D  G  L  I  T  T  L  H  Y  P  A  P  K  R  N  K  P
                    |211                      |221

 |671      |681      |691      |701      |711      |721
ACTGTCTATGGTGTGTCCCCCAACTACGACAAGTGGGAGATGGAACGCACGGACATCACC
 T  V  Y  G  V  S  P  N  Y  D  K  W  E  M  E  R  T  D  I  T
                    |231                      |241

 |731      |741      |751      |761      |771      |781
ATGAAGCACAAGCTGGGCGGGGGCCAGTACGGGGAGGTGTACGAGGGCGTGTGGAAGAAA
 M  K  H  K  L  G  G  G  Q  Y  G  E  V  Y  E  G  V  W  K  K
                    |251                      |261

 |791      |801      |811      |821  .    .    .    .    .
TACAGCCTGACGGTGGCCGTGAAGACCTTGAAGgtaggctgggactgccgggggtgccca
 Y  S  L  T  V  A  V  K  T  L  K
                    |271

  .    .    .    .    .    .    .    .    .    .    .    .
gggtacgtggggcaaggcgtctgctggcattaggcgatgcatctgcctggaagtctacct

  .    .    .    .    .    .    .    .    .    .    .    .
cctgcctgctgtccgagggcttcattggcgccacggaattgacttttccgtcttatatca

  .    .    .    .    .    .    .    .    .    .    .    .
ttcctgtgtctttgtaggagtggaatcattctcatagtccgagtgtgtttccacatatgg

  .    .    .    .    .    .    .    .    .    .    .    .
tgagagctgacaagcatggaggggttttggtgtaaaaagattagtcatttggagaggttt

  .    .    .    .    .    .    .
tctcattttatggcaaggttcttttaaagccgt


Exon 6 | Start: 163249 | End: 163333 | Length: 84

.    .    .    .    .    .    .    .    .    .    .    .
tggggaagcacatgtggcctgcctagcaggcaccagaagcaggttgtcggcacatgcaag

.    .    .    .    .    .    .    .    .    .    .    .
ccagctttgccctgttgcctgggggagaattgaaaagtttggccccaaaggggaaaattc
```

```
.    .    .    .    .    .    .    .    .    .    .    .
tttctgccatcaagttgctggtcagctgtcatggaacctgtctgcagcaatgtggctgtc

.    .    .    .    .    .    .    .    .    .    .    .
acaaaacgcagcccaggacgagtatgcgctgaagctccattttgcattaactagtcaagt

.    .    .    .    .    .    .    .    .    .    .    .
acttacccactgaaaagcacttcctgaaataatttcaccttcgtttttttccttctgcag

        |831      |841      |851      |861      |871      |881
GAGGACACCATGGAGGTGGAAGAGTTCTTGAAAGAAGCTGCAGTCATGAAAGAGATCAAA
 E  D  T  M  E  V  E  E  F  L  K  E  A  A  V  M  K  E  I  K
                  |281                          |291

        |891      |901      .    .    .    .    .    .    .
CACCCTAACCTGGTGCAGCTCCTTGgtgagtaagcccggggctctgaagagagggtctcg
 H  P  N  L  V  Q  L  L
                  |301

    .    .    .    .    .    .    .    .    .    .    .    .
cgccgcacccccagggtgacacaggcgctggggaagacgcacgggcggctcactgcacaa

    .    .    .    .    .    .    .    .    .    .    .    .
aacctcgttggaatatttgtgctctgccgacgttcagccgcgggtaaaatgaggcctgta

    .    .    .    .    .    .    .    .    .    .    .    .
tgggatgggtgtgtgcgtgtgtgcacatatgcacatgtatgtatgagagggagaatgtga

    .    .    .    .    .    .    .    .    .    .    .    .
ttattttaagtggatacctaaaagcagtcaaatgcaaatctgaaattagtttctgaaact

    .    .    .    .    .
tgggcattttccagagttttctcac
```

Exon 7 | Start: 163980 | End: 164157 | Length: 177

```
.    .    .    .    .    .    .    .    .    .    .    .
caggggtaaactgacggtggtgaaggtcatttgaggtggggccaggtctgcgtctgaatt

.    .    .    .    .    .    .    .    .    .    .    .
ctgtggcagcctctccctgcgtaaattcaagttcactggcttgagaagaagaaaagagcc

.    .    .    .    .    .    .    .    .    .    .    .
tggccatgtccctcccacacgagcacagtctcaggatgcaggtgcttgggaccatgttgg
```

```
.    .    .    .    .    .    .    .    .    .    .    .
aagttgggcccaggactgaggagcagagtcagaatccttcagaaggctttttctttagac

.    .    .    .    .    .    .    .    .    .    .    .
agttgtttgttcagttgggagcggagccacgtgttgaagtcctcgttgtcttgttggcag

   |911      |921      |931      |941      |951      |961
GGGTCTGCACCCGGGAGCCCCCGTTCTATATCATCACTGAGTTCATGACCTACGGGAACC
G  V  C  T  R  E  P  P  F  Y  I  I  T  E  F  M  T  Y  G  N
                        |311                        |321

   |971      |981      |991      |1001     |1011     |1021
TCCTGGACTACCTGAGGGAGTGCAACCGGCAGGAGGTGAACGCCGTGGTGCTGCTGTACA
L  L  D  Y  L  R  E  C  N  R  Q  E  V  N  A  V  V  L  L  Y
                        |331                        |341

   |1031     |1041     |1051     |1061     |1071     |1081
TGGCCACTCAGATCTCGTCAGCCATGGAGTACCTGGAGAAGAAAAACTTCATCCACAGgt
M  A  T  Q  I  S  S  A  M  E  Y  L  E  K  K  N  F  I  H  R
                        |351                        |361

  .    .    .    .    .    .    .    .    .    .    .    .
aggggcctggccaggcagcctgcgccatggagtcacagggcgtggagccgggcagccttt

  .    .    .    .    .    .    .    .    .    .    .    .
tacaaaaagccccagcctaggaggtctcagggcgcagcttctaacctcagtgctggcaac

  .    .    .    .    .    .    .    .    .    .    .    .
acattggaccttggaacaaaggcaaacactaggctcctggcaaagccagctttgggcatg

  .    .    .    .    .    .    .    .    .    .    .    .
catccagggctaaattcagccaggcctagactctggaccagtggagcagctaatccccgg

  .    .    .    .    .    .    .    .    .    .    .    .
agtaaggaatatttcatttttgaaccattttgggctaagtggaatattaaatgaagtt


Exon 8 | Start: 165988 | End: 166172 | Length: 184

.    .    .    .    .    .    .    .    .    .    .    .
gccattattatcgtcttcattttacggatgaggtaactgagtcccagggtaattaacttg

.    .    .    .    .    .    .    .    .    .    .    .
ctccaggtcatgaggccagggagcccgctcccagcaccagcctctccccatgttgggatc
```

```
.    .    .    .    .    .    .    .    .    .    .    .
tcagggtgtgtttgctgagaggctggcactgtgttaattgccgtgggcattaatacaaac

.    .    .    .    .    .    .    .    .    .    .    .
ttccagggcattggactcaatctttccattgtcagcattgcacctttgctcagcagtggt

.    .    .    .    .    .    .    .    .    .    .    .
ggatttgtgaagtggaaggttggccaggagctctcatgggtgaacattttcctttcttag

     |1091     |1101     |1111     |1121     |1131     |1141
AGATCTTGCTGCCCGAAACTGCCTGGTAGGGGAGAACCACTTGGTGAAGGTAGCTGATTT
  D  L  A  A  R  N  C  L  V  G  E  N  H  L  V  K  V  A  D  F
                         |371                          |381

     |1151     |1161     |1171     |1181     |1191     |1201
TGGCCTGAGCAGGTTGATGACAGGGGACACCTACACAGCCCATGCTGGAGCCAAGTTCCC
  G  L  S  R  L  M  T  G  D  T  Y  T  A  H  A  G  A  K  F  P
                         |391                          |401

     |1211     |1221     |1231     |1241     |1251     |1261
CATCAAATGGACTGCACCCGAGAGCCTGGCCTACAACAAGTTCTCCATCAAGTCCGACGT
  I  K  W  T  A  P  E  S  L  A  Y  N  K  F  S  I  K  S  D  V
                         |411                          |421

         .    .    .    .    .    .    .    .    .    .    .
CTGGGgtaagggctgctgctgcactgaagtggtccttcctgactacaggagggttttttt
  W


    .    .    .    .    .    .    .    .    .    .    .    .
ctgcctctttcttgctcttccctttctttttcttcctttctttttgtttttttgagacgga

    .    .    .    .    .    .    .    .    .    .    .    .
gtctcactctgtcacccaggctggagtgcagtggtgcaatcttggctcattgcagcctct

    .    .    .    .    .    .    .    .    .    .    .    .
ccctcccgggttcaagcgattctcctgtctcagcatcttgagtagctgggattataggca

    .    .    .    .    .    .    .    .    .    .    .    .
cccgccaccacacccagctaatttttggtatttttagtagagatggggtttcaccatgtt

    .
ggcca
```

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Exon 9 | Start: 169535 | End: 169687 | Length: 152

.    .    .    .    .    .    .    .    .    .    .    .
taatttttgtatttttagtagagatggggtttcgccatgttggccagggtggtcttgaat

.    .    .    .    .    .    .    .    .    .    .    .
tcctgacctcaaataatcctcccacttcagcctcccaaagtgctgggattacaggcgtga

.    .    .    .    .    .    .    .    .    .    .    .
gccaccgcacccagccttgtcctggtcttctgatgataaagagcctggtaaaatgtcaga

.    .    .    .    .    .    .    .    .    .    .    .
gcctgggctgctgctggggccatcccttctgaggtctgctgcaaaggtaactgattttaa

.    .    .    .    .    .    .    .    .    .    .    .
atgtagtgtagtgaaatgctacacatcttgaacagcctttctctttcggttttctttcag

|1271     |1281     |1291     |1301     |1311     |1321
CATTTGGAGTATTGCTTTGGGAAATTGCTACCTATGGCATGTCCCCTTACCCGGGAATTG
A  F  G  V  L  L  W  E  I  A  T  Y  G  M  S  P  Y  P  G  I
                    |431                          |441

|1331     |1341     |1351     |1361     |1371     |1381
ACCTGTCCCAGGTGTATGAGCTGCTAGAGAAGGACTACCGCATGGAGCGCCCAGAAGGCT
D  L  S  Q  V  Y  E  L  L  E  K  D  Y  R  M  E  R  P  E  G
                    |451                          |461

|1391     |1401     |1411     |1421  .    .    .    .    .
GCCCAGAGAAGGTCTATGAACTCATGCGAGCATgtaagccttcctcagcctgttctcacg
C  P  E  K  V  Y  E  L  M  R  A
                    |471

  .    .    .    .    .    .    .    .    .    .    .    .
agtatatgtgggcattccaggaaattcaactgtgcaggagtgtgtacacaaagttgaaag

  .    .    .    .    .    .    .    .    .    .    .    .
ttttccatgagctctctccattccagttcttcagatgcagctaatgtagccatttgcta

  .    .    .    .    .    .    .    .    .    .    .    .
cctattgacctttatttacagataaatagtatgtgcgtgacttgtcttttaaagcaaaaa

  .    .    .    .    .    .    .    .    .    .    .    .
tggtattgatagataccaaacctgggtgtattcctaaatacagattcctgggccctgctt

  .    .    .    .    .    .    .
```

```
tcacagacattctgctatagtagctaagctcat



Exon 10 | Start: 171188 | End: 171277 | Length: 89

.    .    .    .    .    .    .    .    .    .    .    .
tagtaattttctacacctactagagcgggactgggaaaaatatatttgtaaatgcagttc

.    .    .    .    .    .    .    .    .    .    .    .
ttgctgtcactgtctctctggggttttacaatccatattcctgccagcatctaacgtctt

.    .    .    .    .    .    .    .    .    .    .    .
ttcaaattcttaatgtctataacaggacatgatgacattcatcgttttgacttgttgcag

.    .    .    .    .    .    .    .    .    .    .    .
caaaagatggttagcaggattggaatgttgctttcattctagacttttccttgagaactg

.    .    .    .    .    .    .    .    .    .    .    .
ctagccccgtattgctagccagatctcatggatgatctgacttgggtttcatctgtccag

       |1431     |1441     |1451     |1461     |1471     |1481
GTTGGCAGTGGAATCCCTCTGACCGGCCCTCCTTTGCTGAAATCCACCAAGCCTTTGAAA
C  W  Q  W  N  P  S  D  R  P  S  F  A  E  I  H  Q  A  F  E
                  |481                          |491

       |1491     |1501     |1511  .    .    .    .    .    .
CAATGTTCCAGGAATCCAGTATCTCAGACGgtaaagtacccatcccggggtacctgcagt
T  M  F  Q  E  S  S  I  S  D
                  |501

    .    .    .    .    .    .    .    .    .    .    .    .
ggggtgaaagggcagccatgtgggactgcagcctgggtcattcggttcacttcctggtga

    .    .    .    .    .    .    .    .    .    .    .    .
aagttcacagaccagcctgtcctgagaccagaaagctgggcagaggtgtggagtattgtg

    .    .    .    .    .    .    .    .    .    .    .    .
ctttcttgtctgctgcagccctgcagagttctaagaaatgctaagggctgtttctccggt

    .    .    .    .    .    .    .    .    .    .    .    .
atccacgtgccttttctttagttgtatgcagatgagcactgttaccttacaaagaaagag

    .    .    .    .    .    .
aaccaccacaccaagccaacaccagtactg
```

Exon 11 | Start: 171620 | End: 171784 | Length: 164

```
.    .    .    .    .    .    .    .    .    .    .    .
cagccatgtgggactgcagcctgggtcattcggttcacttcctggtgaaagttcacagac

.    .    .    .    .    .    .    .    .    .    .    .
cagcctgtcctgagaccagaaagctgggcagaggtgtggagtattgtgctttcttgtctg

.    .    .    .    .    .    .    .    .    .    .    .
ctgcagccctgcagagttctaagaaatgctaagggctgtttctccggtatccacgtgcct

.    .    .    .    .    .    .    .    .    .    .    .
tttctttagttgtatgcagatgagcactgttaccttacaaagaaagagaaccaccacacc

.    .    .    .    .    .    .    .    .    .    .    .
aagccaacaccagtactgatggctgctggatttttgtttctgtccctgtatgattcttag

       |1521     |1531     |1541     |1551     |1561     |1571
AAGTGGAAAAGGAGCTGGGGAAACAAGGCGTCCGTGGGGCTGTGAGTACCTTGCTGCAGG
E  V  E  K  E  L  G  K  Q  G  V  R  G  A  V  S  T  L  L  Q
                  |511                          |521

       |1581     |1591     |1601     |1611     |1621     |1631
CCCCAGAGCTGCCCACCAAGACGAGGACCTCCAGGAGAGCTGCAGAGCACAGAGACACCA
A  P  E  L  P  T  K  T  R  T  S  R  R  A  A  E  H  R  D  T
                  |531                          |541

       |1641     |1651     |1661     |1671       .    .    .
CTGACGTGCCTGAGATGCCTCACTCCAAGGGCCAGGGAGAGAGCGgtaagtcccccgctt
T  D  V  P  E  M  P  H  S  K  G  Q  G  E  S
                  |551

    .    .    .    .    .    .    .    .    .    .    .    .
cccccaaccccactgctcttcccttccctgccagaggctacattcaggccatcataggcc

    .    .    .    .    .    .    .    .    .    .    .    .
aacgggaagctgtgaatggagcccgcacagaagggcagccatggcctttgtcaatggttc

    .    .    .    .    .    .    .    .    .    .    .    .
agcttcggaaggaggaaggttctcctctccccacctgcctcctatcccctccctctgaga

    .    .    .    .    .    .    .    .    .    .    .    .
gtccccgaggagcataggctccagcagtgagttcagtcctgtaggcagaggtgcttctga
```

```
    .    .    .    .    .    .    .    .    .
agcccgccaaggagctagcccatctcccacctattacccgcggca
```

Exon 12 | Start: 175089 | End: 178795 | Length: 3706

```
.    .    .    .    .    .    .    .    .    .    .    .
gggtcaaaacctgtggctctcctgccagccagctagccgagaggcctatgaggagctctg

.    .    .    .    .    .    .    .    .    .    .    .
ggaataaggggctgtgtcccacagtggggaagggacaatgggccattatgcacaggagat

.    .    .    .    .    .    .    .    .    .    .    .
aagaagggatgacctttgacaatttttttgtttgtttgtttgtttgttttgagatggagt

.    .    .    .    .    .    .    .    .    .    .    .
ctcactctgtctcctgggctggagtgcagcagtggcactctgcctcccgggttcaagcga

.    .    .    .    .    .    .    .    .    .    .    .
ttctcctctgtcagcctctagagttgtctggagttgtcagctcttccccttgcgtttcag

  |1681     |1691     |1701     |1711     |1721     |1731
ATCCTCTGGACCATGAGCCTGCCGTGTCTCCATTGCTCCCTCGAAAAGAGCGAGGTCCCC
D  P  L  D  H  E  P  A  V  S  P  L  L  P  R  K  E  R  G  P
   |561                        |571

  |1741     |1751     |1761     |1771     |1781     |1791
CGGAGGGCGGCCTGAATGAAGATGAGCGCCTTCTCCCCAAAGACAAAAAGACCAACTTGT
P  E  G  G  L  N  E  D  E  R  L  L  P  K  D  K  K  T  N  L
   |581                        |591

  |1801     |1811     |1821     |1831     |1841     |1851
TCAGCGCCTTGATCAAGAAGAAGAAGAAGACAGCCCCAACCCCTCCCAAACGCAGCAGCT
F  S  A  L  I  K  K  K  K  K  T  A  P  T  P  P  K  R  S  S
   |601                        |611

  |1861     |1871     |1881     |1891     |1901     |1911
CCTTCCGGGAGATGGACGGCCAGCCGGAGCGCAGAGGGGCCGGCGAGGAAGAGGGCCGAG
S  F  R  E  M  D  G  Q  P  E  R  R  G  A  G  E  E  E  G  R
   |621                        |631

  |1921     |1931     |1941     |1951     |1961     |1971
ACATCAGCAACGGGGCACTGGCTTTCACCCCCTTGGACACAGCTGACCCAGCCAAGTCCC
D  I  S  N  G  A  L  A  F  T  P  L  D  T  A  D  P  A  K  S
   |641                        |651
```

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  |1981     |1991     |2001     |2011     |2021     |2031
CAAAGCCCAGCAATGGGGCTGGGGTCCCCAATGGAGCCCTCCGGGGAGTCCGGGGGCTCAG
P  K  P  S  N  G  A  G  V  P  N  G  A  L  R  E  S  G  G  S
   |661                          |671

  |2041     |2051     |2061     |2071     |2081     |2091
GCTTCCGGTCTCCCCACCTGTGGAAGAAGTCCAGCACGCTGACCAGCAGCCGCCTAGCCA
G  F  R  S  P  H  L  W  K  K  S  S  T  L  T  S  S  R  L  A
   |681                          |691

  |2101     |2111     |2121     |2131     |2141     |2151
CCGGCGAGGAGGAGGGCGGTGGCAGCTCCAGCAAGCGCTTCCTGCGCTCTTGCTCCGCCT
T  G  E  E  E  G  G  G  S  S  S  K  R  F  L  R  S  C  S  A
   |701                          |711

  |2161     |2171     |2181     |2191     |2201     |2211
CCTGCGTTCCCCATGGGGCCAAGGACACGGAGTGGAGGTCAGTCACGCTGCCTCGGGACT
S  C  V  P  H  G  A  K  D  T  E  W  R  S  V  T  L  P  R  D
   |721                          |731

  |2221     |2231     |2241     |2251     |2261     |2271
TGCAGTCCACGGGAAGACAGTTTGACTCGTCCACATTTGGAGGGCACAAAAGTGAGAAGC
L  Q  S  T  G  R  Q  F  D  S  S  T  F  G  G  H  K  S  E  K
   |741                          |751

  |2281     |2291     |2301     |2311     |2321     |2331
CGGCTCTGCCTCGGAAGAGGGCAGGGGAGAACAGGTCTGACCAGGTGACCCGAGGCACAG
P  A  L  P  R  K  R  A  G  E  N  R  S  D  Q  V  T  R  G  T
   |761                          |771

  |2341     |2351     |2361     |2371     |2381     |2391
TAACGCCTCCCCCCAGGCTGGTGAAAAAGAATGAGGAAGCTGCTGATGAGGTCTTCAAAG
V  T  P  P  P  R  L  V  K  K  N  E  E  A  A  D  E  V  F  K
   |781                          |791

  |2401     |2411     |2421     |2431     |2441     |2451
ACATCATGGAGTCCAGCCCGGGCTCCAGCCCGCCCAACCTGACTCCAAAACCCCTCCGGC
D  I  M  E  S  S  P  G  S  S  P  P  N  L  T  P  K  P  L  R
   |801                          |811

  |2461     |2471     |2481     |2491     |2501     |2511
GGCAGGTCACCGTGGCCCCTGCCTCGGGCCTCCCCCACAAGGAAGAAGCTGGAAAGGGCA
R  Q  V  T  V  A  P  A  S  G  L  P  H  K  E  E  A  G  K  G
   |821                          |831
```

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  |2521     |2531     |2541     |2551     |2561     |2571
GTGCCTTAGGGACCCCTGCTGCAGCTGAGCCAGTGACCCCCACCAGCAAAGCAGGCTCAG
S  A  L  G  T  P  A  A  A  E  P  V  T  P  T  S  K  A  G  S
   |841                          |851

  |2581     |2591     |2601     |2611     |2621     |2631
GTGCACCAGGGGGCACCAGCAAGGGCCCCGCCGAGGAGTCCAGAGTGAGGAGGCACAAGC
G  A  P  G  G  T  S  K  G  P  A  E  E  S  R  V  R  R  H  K
   |861                          |871

  |2641     |2651     |2661     |2671     |2681     |2691
ACTCCTCTGAGTCGCCAGGGAGGGACAAGGGGAAATTGTCCAGGCTCAAACCTGCCCCGC
H  S  S  E  S  P  G  R  D  K  G  K  L  S  R  L  K  P  A  P
   |881                          |891

  |2701     |2711     |2721     |2731     |2741     |2751
CGCCCCCACCAGCAGCCTCTGCAGGGAAGGCTGGAGGAAAGCCCTCGCAGAGCCCGAGCC
P  P  P  P  A  A  S  A  G  K  A  G  G  K  P  S  Q  S  P  S
   |901                          |911

  |2761     |2771     |2781     |2791     |2801     |2811
AGGAGGCGGCCGGGGAGGCAGTCCTGGGCGCAAAGACAAAAGCCACGAGTCTGGTTGATG
Q  E  A  A  G  E  A  V  L  G  A  K  T  K  A  T  S  L  V  D
   |921                          |931

  |2821     |2831     |2841     |2851     |2861     |2871
CTGTGAACAGTGACGCTGCCAAGCCCAGCCAGCCGGGAGAGGGCCTCAAAAAGCCCGTGC
A  V  N  S  D  A  A  K  P  S  Q  P  G  E  G  L  K  K  P  V
   |941                          |951

  |2881     |2891     |2901     |2911     |2921     |2931
TCCCGGCCACTCCAAAGCCACAGTCCGCCAAGCCGTCGGGGACCCCCATCAGCCCAGCCC
L  P  A  T  P  K  P  Q  S  A  K  P  S  G  T  P  I  S  P  A
   |961                          |971

  |2941     |2951     |2961     |2971     |2981     |2991
CCGTTCCCTCCACGTTGCCATCAGCATCCTCGGCCCTGGCAGGGGACCAGCCGTCTTCCA
P  V  P  S  T  L  P  S  A  S  S  A  L  A  G  D  Q  P  S  S
   |981                          |991

  |3001     |3011     |3021     |3031     |3041     |3051
CCGCCTTCATCCCTCTCATATCAACCCGAGTGTCTCTTCGGAAAACCCGCCAGCCTCCAG
T  A  F  I  P  L  I  S  T  R  V  S  L  R  K  T  R  Q  P  P
   |1001                         |1011

  |3061     |3071     |3081     |3091     |3101     |3111
```

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AGCGGATCGCCAGCGGCGCCATCACCAAGGGCGTGGTCCTGGACAGCACCGAGGCGCTGT
E  R  I  A  S  G  A  I  T  K  G  V  V  L  D  S  T  E  A  L
   |1021                        |1031

  |3121     |3131     |3141     |3151     |3161     |3171
GCCTCGCCATCTCTAGGAACTCCGAGCAGATGGCCAGCCACAGCGCAGTGCTGGAGGCCG
C  L  A  I  S  R  N  S  E  Q  M  A  S  H  S  A  V  L  E  A
   |1041                        |1051

  |3181     |3191     |3201     |3211     |3221     |3231
GCAAAAACCTCTACACGTTCTGCGTGAGCTATGTGGATTCCATCCAGCAAATGAGGAACA
G  K  N  L  Y  T  F  C  V  S  Y  V  D  S  I  Q  Q  M  R  N
   |1061                        |1071

  |3241     |3251     |3261     |3271     |3281     |3291
AGTTTGCCTTCCGAGAGGCCATCAACAAACTGGAGAATAATCTCCGGGAGCTTCAGATCT
K  F  A  F  R  E  A  I  N  K  L  E  N  N  L  R  E  L  Q  I
   |1081                        |1091

  |3301     |3311     |3321     |3331     |3341     |3351
GCCCGGCGACAGCAGGCAGTGGTCCAGCGGCCACTCAGGACTTCAGCAAGCTCCTCAGTT
C  P  A  T  A  G  S  G  P  A  A  T  Q  D  F  S  K  L  L  S
   |1101                        |1111

  |3361     |3371     |3381     |3391          |+11       |+21
CGGTGAAGGAAATCAGTGACATAGTGCAGAGGTAGCAGCAGTCAGGGGTCAGGTGTCAGG
S  V  K  E  I  S  D  I  V  Q  R  *
   |1121                        |1131

      |+31      |+41      |+51      |+61      |+71      |+81
CCCGTCGGAGCTGCCTGCAGCACATGCGGGCTCGCCCATACCCGTGACAGTGGCTGACAA

      |+91      |+101     |+111     |+121     |+131     |+141
GGGACTAGTGAGTCAGCACCTTGGCCCAGGAGCTCTGCGCCAGGCAGAGCTGAGGGCCCT

      |+151     |+161     |+171     |+181     |+191     |+201
GTGGAGTCCAGCTCTACTACCTACGTTTGCACCGCCTGCCCTCCCGCACCTTCCTCCTCC

      |+211     |+221     |+231     |+241     |+251     |+261
CCGCTCCGTCTCTGTCCTCGAATTTTATCTGTGGAGTTCCTGCTCCGTGGACTGCAGTCG

      |+271     |+281     |+291     |+301     |+311     |+321
GCATGCCAGGACCCGCCAGCCCCGCTCCCACCTAGTGCCCCAGACTGAGCTCTCCAGGCC

      |+331     |+341     |+351     |+361     |+371     |+381
AGGTGGGAACGGCTGATGTGGACTGTCTTTTTCATTTTTTTCTCTCTGGAGCCCCTCCTC
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      |+391      |+401      |+411      |+421      |+431      |+441
CCCCGGCTGGGCCTCCTTCTTCCACTTCTCCAAGAATGGAAGCCTGAACTGAGGCCTTGT

      |+451      |+461      |+471      |+481      |+491      |+501
GTGTCAGGCCCTCTGCCTGCACTCCCTGGCCTTGCCCGTCGTGTGCTGAAGACATGTTTC

      |+511      |+521      |+531      |+541      |+551      |+561
AAGAACCGCATTTCGGGAAGGGCATGCACGGGCATGCACACGGCTGGTCACTCTGCCCTC

      |+571      |+581      |+591      |+601      |+611      |+621
TGCTGCTGCCCGGGGTGGGGTGCACTCGCCATTTCCTCACGTGCAGGACAGCTCTTGATT

      |+631      |+641      |+651      |+661      |+671      |+681
TGGGTGGAAAACAGGGTGCTAAAGCCAACCAGCCTTTGGGTCCTGGGCAGGTGGGAGCTG

      |+691      |+701      |+711      |+721      |+731      |+741
AAAAGGATCGAGGCATGGGGCATGTCCTTTCCATCTGTCCACATCCCCAGAGCCCAGCTC

      |+751      |+761      |+771      |+781      |+791      |+801
TTGCTCTCTTGTGACGTGCACTGTGAATCCTGGCAAGAAAGCTTGAGTCTCAAGGGTGGC

      |+811      |+821      |+831      |+841      |+851      |+861
AGGTCACTGTCACTGCCGACATCCCTCCCCCAGCAGAATGGAGGCAGGGGACAAGGGAGG

      |+871      |+881      |+891      |+901      |+911      |+921
CAGTGGCTAGTGGGGTGAACAGCTGGTGCCAAATAGCCCCAGACTGGGCCCAGGCAGGTC

      |+931      |+941      |+951      |+961      |+971      |+981
TGCAAGGGCCCAGAGTGAACCGTCCTTTCACACATCTGGGTGCCCTGAAAGGGCCCTTCC

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

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

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

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

      |+1231     |+1241     |+1251     |+1261     |+1271     |+1281
ACATAGCCTCATGTTCTGTGGGGGTCATCAGGGAGGGTTAGGAAAACCACAAACGGAGCC
```

```
      |+1291     |+1301     |+1311     |+1321     |+1331     |+1341
CCTGAAAGCCTCACGTATTTCACAGAGCACGCCTGCCATCTTCTCCCCGAGGCTGCCCCA

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

      |+1411     |+1421     |+1431     |+1441     |+1451     |+1461
TGACAGAGCAGCTAACTCCGAGAGCAGTGGGCAGGTGGCCGCCCCTGAGGCTTCACGCCG

      |+1471     |+1481     |+1491     |+1501     |+1511     |+1521
GGAGAAGCCACCTTCCCACCCCTTCATACCGCCTCGTGCCAGCAGCCTCGCACAGGCCCT

      |+1531     |+1541     |+1551     |+1561     |+1571     |+1581
AGCTTTACGCTCATCACCTAAACTTGTACTTTATTTTTCTGATAGAAATGGTTTCCTCTG

      |+1591     |+1601     |+1611     |+1621     |+1631     |+1641
GATCGTTTTATGCGGTTCTTACAGCACATCACCTCTTTGCCCCCGACGGCTGTGACGCAG

      |+1651     |+1661     |+1671     |+1681     |+1691     |+1701
CCGGAGGGAGGCACTAGTCACCGACAGCGGCCTTGAAGACAGAGCAAAGCGCCCACCCAG

      |+1711     |+1721     |+1731     |+1741     |+1751     |+1761
GTCCCCCGACTGCCTGTCTCCATGAGGTACTGGTCCCTTCCTTTTGTTAACGTGATGTGC

      |+1771     |+1781     |+1791     |+1801     |+1811     |+1821
CACTATATTTTACACGTATCTCTTGGTATGCATCTTTTATAGACGCTCTTTTCTAAGTGG

      |+1831     |+1841     |+1851     |+1861     |+1871     |+1881
CGTGTGCATAGCGTCCTGCCCTGCCCCCTCGGGGGCCTGTGGTGGCTCCCCCTCTGCTTC

      |+1891     |+1901     |+1911     |+1921     |+1931     |+1941
TCGGGGTCCAGTGCATTTTGTTTCTGTATATGATTCTCTGTGGTTTTTTTTGAATCCAAA

      |+1951     |+1961     |+1971     |+1981     |+1991     .
TCTGTCCTCTGTAGTATTTTTTAAATAAATCAGTGTTTACATTAGAAttcttggcagatt

 .    .    .    .    .    .    .    .    .    .    .    .
gcttcggcctgtgatcctgccctgttgttctgagcctgtgcggtggcggggccgggatgt

 .    .    .    .    .    .    .    .    .    .    .    .
agtgggttctggtttcccgacggggctggggcccggcatcaggtcttacagagcagaacg

 .    .    .    .    .    .    .    .    .    .    .    .
gtggcaggttgcccccagctgcccagggcctctgcggcctgggtgcccacagccatcttt

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

```
caggcacttgccctgctatgctcggacccttttctgtacccttggcgcttacctgctggca

 .    .    .    .    .    .    .    .    .    .
gcctggccccaccggcatcactgggagtgggctgtgccaccatacaa


LRG Parser: Version: 1.1, Version Date: 11/02/2015
Reader: Version: 1, Version Date: 11/02/2015
Writer: Version: 1, Version Date: 11/02/2015
Control: Version: 1, Version Date: 11/02/2015
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