

Gene: ASL - Sequence: NG_009288.1
 Transcript: NM_000048.3 - Protein: NP_000039.2
 Date : Thursday 11th June, 2015

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

Exon 1 | Start: 5001 | End: 5068 | Length: 67
 BE AWARE: Flanking intron is shared with the following exon

```

. . . . .
ggcctgatgtcatagcctctacccttgcccgaggtctccagtcacctgcgtgtctgtgag
. . . . .
ccacagcacgaacgccagcgactaccctcctcaaccccagcccaggccccttccccgtc
. . . . .
gggggtcccccaaccctttccccgcccgttccccgccccggggccgcttagcctccagc
. . . . .
tcagcgggaggtatccccgccacggccaggattggaggatggaggcaacgccacccccg
. . . . .
ccggggcggcctcctattggcgcgccgtcgccaggggtggggacaggaccggcggctgct

|-109      |-99      |-89      |-79      |-69      |-59
GACGCCATCCCGCCAGAAAAGCCCTGGCCAGTGGCGGGCGCGACACTATCCGTGCGGCC

|-49
AGGCGGAGgtgagtgcgcggcgccggatgggcgggacgggcgtggaggacgccgagcac
. . . . .
cgtggcgcgcgctcacgtccgcgtccccaagggtgcg

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Exon 2 | Start: 5251 | End: 5305 | Length: 54
 BE AWARE: Flanking intron is shared with the previous exon

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. . . . .
tccctcaagcgagtgcccagaactcggagccagcccggccgggggaccctgctggcca

. . . . . | -39 | -29 | -19
aggaggtcgtcagtcgggtcttgtcttcagACCCGGAGGACCGAAGCTTCCGGACGACG

      | -9      | 1      | 11      . . . . .
AGGAACCGCCCAACATGGCCTCGGAGgtgagtgaggacctcggggactccggtcctcctag
      M A S E
      | 1

. . . . .
cctccaaaggagagagtgggggcgccagacctgcctcgggccaccctgctgggaatcgcc

. . . . .
ctccaggaagcaatTTTgaaaattacctaggaagcctgcacccccagccctcccgggcgcc

. . . . .
atcatctggagcccagcagtcacctttaccaggactcaccagtatccgcaggcagccctt

. . . . .
gtggcaaaccaccaaaccacactactaggggtagagtggctctgccctcacctcacagt

. . . . .
gatgcctgcctggccaggaaaagtgg

```

Exon 3 | Start: 11015 | End: 11209 | Length: 194
 BE AWARE: Flanking intron is shared with the following exon

.
 ctgggaggcagagtttgcagtgagctgagatggcaccactgtactccagcctggccgaca

 aagtgagactctgtctcaaaaaaaaaaaaaagaacccaaacttttgggtgttcagccatg

 ttcccatgctcactcccagggtggtgactctgggaaggctctcagcctccttgtctgccca

 gttagaatgatctgatgcccctgtaccatcagacttgataagtttcccaaagactcttt

 gcaagaagcactgttctggagggtggaggagagactaattgttcttgctctcctggccag

21	31	41	51	61	71
AGTGGGAAGCTTTGGGGTGGCCGTTTGTGGGTGCAGTGGACCCCATCATGGAGAAGTTC					
S G K L W G G R F V G A V D P I M E K F					
	11			21	

81	91	101	111	121	131
AACGCGTCCATTGCCTACGACCGGCACCTTTGGGAGGTGGATGTTCAAGGCAGCAAAGCC					
N A S I A Y D R H L W E V D V Q G S K A					
	31			41	

141	151	161	171	181	191
TACAGCAGGGGCTGGAGAAGGCAGGGCTCCTCACCAAGGCCGAGATGGACCAGATACTC					
Y S R G L E K A G L L T K A E M D Q I L					
	51			61	

201
CATGGCCTAGACAAGgtacttgccgtggcccaagccccaccaaggccccttcctgtgg	
H G L D K	

.
 cccaggtctccaccaaattccctgagcaaacagtgagtggttggccatctgtggtttcac

.
 attgaactaattatatactcaagtgctgtttaactgtgtgccttgatgactgcctctctc

. . .
 catcctttaatgaccctg

Exon 4 | Start: 11580 | End: 11663 | Length: 83
BE AWARE: Flanking intron is shared with both adjacent exons

```
. . . . .
ggcccatggtcatgggtaaaggtgtgctgggcctgagatgccccctcccagggtgcg

. . . . .
cttcaggactcagctcctgggcaggacagtcagtcaccagggatagggtgggaccaag

. . . . .
gcaggggctctcttggtgctgatgcctgctcacctgaccccgccattgctgctaccac

.      |211      |221      |231      |241      |251      |261
tacagGTGGCTGAGGAGTGGGCCAGGGCACCTTCAAAGTGAAGTCAATGATGAGGACA
      V A E E W A Q G T F K L N S N D E D I
      |71                      |81

      |271      |281      |291 . . . . .
TCCACACAGCCAATGAGCGCCGCTGAAGgtacgaccctggagccccaccgctttcctt
      H T A N E R R L K
      |91

. . . . .
gcctccccctctccaccttgcccagggccactttgagcattagcaccattctgtttacttc

. . . . .
gccattggcagacagcatgtgagacctcaggacatgagccaggcacccctggctcatgcct

. . . . .
ataatcctagcactttgggaggctgaggtgggaggattgcttgagaccaggagttcgaga

c
```

Exon 5 | Start: 12092 | End: 12148 | Length: 56
 BE AWARE: Flanking intron is shared with both adjacent exons

```

. . . . .
agcctgggcaacataatgaggtcccacagctacaaaaattaaaaaagaaaagaaaaaa

. . . . .
gaacaggcctcagcagaaatggcgagagatttggggaggacccggagccctggggtatgg

. . . . .
aggtaggttggcagggtgatgaggaaaactgccctgcctgggttgactcctctgggggt

. . . . . |301 |311
atagaccgtgaccctgggtctcccttcacctccagGAGCTCATTGGTGCAACGGCAGGGA
                E L I G A T A G K
                |101

|321 |331 |341 . . . . .
AGCTGCACACGGGACGGAGCCGGAATGACCAGgtgctttagcccctccaccccctgctcc
L H T G R S R N D Q
|111

. . . . .
gtgttggtcccaaccttgaggagcccagggggcagtttagag

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Exon 6 | Start: 12289 | End: 12386 | Length: 97
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . .
tctgcagcggctcctggctcctcagggaagcaacacatcggcctccctgagcaccatctcc

. . . |351 |361 |371 |381 |391
tccttgcacagGTGGTCACAGACCTCAGGCTGTGGATGCGGCAGACCTGCTCCACGCTCT
      V V T D L R L W M R Q T C S T L S
      |121 |131

|401 |411 |421 |431 |441 . .
CGGGCCTCCTCTGGGAGCTCATTAGGACCATGGTGGATCGGGCAGAGGCgtgagtcctac
  G L L W E L I R T M V D R A E A
      |141

. . . . .
agggacacccagggggcagacagaggtgtgatggaagcctgaacaggagacctagggggc

. . . . .
agggggtgaacagcgtgggggtgccaggccctgggggacaggggcatcccagaactccagg

. . . . .
atcgaggcagagcagccaggagtgggccatcttctgcaggccccaatactcccatgccag

. . . . .
tctagctcagcaggcagagaagactaacccttcgtggggctgggtgcggtggctcacgcc

. . . . .
tgtaatctcagcactttgggaggccgaggtgggtggatcacctgaggtc

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Exon 7 | Start: 15797 | End: 15874 | Length: 77
 BE AWARE: Flanking intron is shared with the following exon

```

. . . . .
tattctggcccctgctcggagatgctgagtgcacagaggctggacttggggtgtttctggc
. . . . .
aaagcctcactgcaggaagccccacagctcaggcccagtccttggttcacacgggtccac
. . . . .
ttccagcttcttttgccttaagactgatttgtccctgggagatcaccagatccctcatt
. . . . .
caggtgggagtgcagcgtgacactttttccaggggtgaccaggcctgcagggttcca
. . . . .
gtgtcacaggcaggccttgcatgagcctccacccgagcttctgctcctcctctcccacag

      |451      |461      |471      |481      |491      |501
GGAACGTGATGTTCTCTTCCCGGGGTACACCCATTTCAGAGGGGCCAGCCCATCCGCTG
E  R  D  V  L  F  P  G  Y  T  H  L  Q  R  A  Q  P  I  R  W
      |151                                |161

      |511      |521      . . . . .
GAGCCACTGGATTCTGAGgtgagccaggtgaggtgcaggggctgtgctagaggggagg
S  H  W  I  L  S
      |171

```

Exon 8 | Start: 15956 | End: 16033 | Length: 77
 BE AWARE: Flanking intron is shared with both adjacent exons

```

. . . . . |531 |541
ccccggctgccctgaccctcctgcccctggcttcccacagCCACGCCGTGGCACTGACCC
                                     H A V A L T R
                                     |181

      |551      |561      |571      |581      |591      |601
GAGACTCTGAGCGGCTGCTGGAGGTGCGGAAGCGGATCAATGTCCTGCCCTGGGGAGgt
  D S E R L L E V R K R I N V L P L G S
                        |191                        |201

. . . . .
gggtgaggctccagtgccccgagggcctgggtgggggtggctgctgcatagccttagggat

. . . . .
tgacagagctgggaagtgcagagtgggacagaaaaccgccttatctgctcagcgggggac

. . . . .
tctgcatggagccccagctctcgctaaggtgacgaccaagccattgaatgtgtctgagca

. . . . .
gggccagagccctccagcaaggctcctggcaagcccagcctgctgccctcagcctgacat

. .
gtgggaacatgt

```


tcaggagacaagtgtcctgcaccagggtgacttagtgcttggggacaagtgttttgtgg

 acacttggggacaagtattctgtacccaagggagactgggccagggaagaggctaagcgcc

 aggtggttgccctggcaaccaggacttggttctctgtgtgtgcgttcgtgtgtgtgtgtg

 tgtgtgtgtgtgtgtgtgtgtgtgtgtcagggctgcctgccaggagccctgggtcaccatg

 aatccctgtccctgcagTGGGGCCATTGCAGGCAATCCCCTGGGTGTGGACCGAGAGCTG
 G A I A G N P L G V D R E L
 |211
 |651
 CTCCGAGCAGgtgagacgtcctgcccctcctccccaggggagaatcacccctcagcaccggc
 L R A E

 caagacctgcagacacacctgaaaccagagggcaggggcctgtggctcctggtgaaacct

 tcattcattgcctatgggcactgaggtcatcaagttcaggggtcactcatggcaggggatg

Exon 10 | Start: 16941 | End: 17003 | Length: 62
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . .
ctggtactgagagactcagggctcctgcctccctcctgggactgtgcaaaagatccctcc

. . . . .
ccccagctgttgccccaccctgatcaggggagggggctgggcaacctagttgggggagag

. . . . . |661
ggggccactccctgtcctccagcttagccctgcttcctccacccccccagAACTCAACT
                                     L N F
                                     |221

      |671      |681      |691      |701      |711      .
TTGGGGCCATCACTCTCAACAGCATGGATGCCACTAGTGAGCGGGACTTTGTGGgtgagt
  G A I T L N S M D A T S E R D F V A
                        |231

. . . . .
cctggggagccagtcacctgcctgtgcctcacttttagtccttcagcccagcttctctcc

. . . . .
agtttcctcccacacctccacggacaggctggttggtgatattgtacactgaagtata

. . . . .
aaccttaaattgggtaaagtgggtggggcatggtggttcacccagcactggccaac

. . . . .
atggtgaaacccatctctactaagaatacaaaatttagctgggtgtgtggtggcaggtg

. . . . .
cctgtaatcccagctactcaggagttctgaggccagagaatcactgaaccag

```

Exon 11 | Start: 18019 | End: 18133 | Length: 114
BE AWARE: Flanking intron is shared with the following exon

```
. . . . .
ataaattgtatgtgagtgataactcagtaaagctggtttatttaaacaacaacaataac

. . . . .
aaaaaacacgctaggtgcaatggcttacgtttgtaatcctagcactttgggaggccaaag

. . . . .
cagaaggattgcttgagcccacaagtttcagaacagcttgggcgacatagcacgacccca

. . . . .
tctttgcgaaaaatgaaaatttagccgggtccccccaccgcctaacctcctcctgcccc

. . . . .
tgtatggtcaggctgggtgggatgggagaggcctggtgactgggaaccttttctcccag

|721      |731      |741      |751      |761      |771
CCGAGTTCCTGTTCTGGGCTTCGCTGTGCATGACCCATCTCAGCAGGATGGCCGAGGACC
E F L F W A S L C M T H L S R M A E D L
|241                                |251

|781      |791      |801      |811      |821      |831 .
TCATCCTCTACTGCACCAAGGAATTCAGCTTCGTGCAGCTCTCAGATGCCTACAGgtaag
I L Y C T K E F S F V Q L S D A Y S
|261                                |271

. . . . .
ccctgaactgccacctccatctgccgctgccggcctctgtatccccgcgcccgcggac

. . . . .
gtggctgccttcctccccg
```

Exon 12 | Start: 18303 | End: 18387 | Length: 84
BE AWARE: Flanking intron is shared with both adjacent exons

.
cccacccctccgccagacctggccattgcggcgctggaccagccaagggtccagcccctt

. |841 |851 |861
cagcgccagcacctctgtccccagCACGGGAAGCAGCCTGATGCCCCAGAAGAAAAACCC
T G S S L M P Q K K N P
|281

|871 |881 |891 |901 |911 . .
CGACAGTTTGGAGCTGATCCGGAGCAAGGCTGGGCGTGTTTGGGCGGgtgagcaaggc
D S L E L I R S K A G R V F G R
|291 |301

.
agggggaggggaggggcctctgggctgatggtgggtg

Exon 13 | Start: 18488 | End: 18547 | Length: 59
BE AWARE: Flanking intron is shared with both adjacent exons

```
. . . . . |921
ccaggggggcaggatcccgggtccagcccctgtgcctccctcttcccgcagTGTGCCGGG
                                     C A G
```

```
      |931      |941      |951      |961      |971      .
CTCCTGATGACCCTCAAGGGACTTCCCAGCACCTACAACAAAGACTTACAGgtgcgaggc
L L M T L K G L P S T Y N K D L Q
      |311                      |321
```

```
. . . . .
cgggggaggcctggctagtagtgccagttctcagggtcttggcacactcaggcagggcc
```

```
. . . . .
ccaccccgggattgccatacatcctcccatcctgtgcacacagctccatccgtggctgcc
```

```
. .
cttgaac
```

Exon 14 | Start: 18824 | End: 18907 | Length: 83
BE AWARE: Flanking intron is shared with the previous exon

```
. . . . .
ctctgcccttcctttgttgggtattgagtgttcttcccatggaaggcagtggggatgcc

. . . . .
tcagtgggggggtggggctgtggggaccctgggtgccagggggctgctaggccctcacct

. . . . . |981 |991 |1001 |1011
cctgccatgtgcctcccagGAGGACAAGGAAGCTGTGTTGAAGTGCAGACACTATGAG
                E D K E A V F E V S D T M S
                |331

|1021 |1031 |1041 |1051 |1061 . . .
TGCCGTGCTCCAGGTGGCCACTGGCGTCATCTCTACGCTGCAGgcaagacatcaccccc
A V L Q V A T G V I S T L Q
|341 |351

. . . . .
tgcttctcctcccctaggtcccaggcactgggggtgggcatgcggggagggtggccttggg

. . . . .
aggaggtgaggtggggctggaggacctggggcagggaaggagaggtgtgctcgctcctgc

. . . . .
tcctggggaacagggaaggacagaaactgctgcatgcagtggaagtagatgagactca

. . . . .
gggggcctggggcctgtcaaatggcctgaccagaactctttaaaaaaagaaaatctaaac

. . . . .
aaaaggccaggtgcagtggtcatgcctggaatctcacacttt
```

Exon 15 | Start: 21218 | End: 21298 | Length: 80
BE AWARE: Flanking intron is shared with the following exon

```
. . . . .
gaccctgtctcctaaaacagaaaacaaatcctccaggaacatctgatgcatgctgaagat

. . . . .
aaggactctttgaaaacataaaggccagtaaaacatacaggccagtaagtgttcatagca

. . . . .
catgtaaataattatcgataattatgagaagatgggttcaagttgagagtgagacagagccg

. . . . .
agtgggtaagagagtatctgccaaggcagggatgtcctggcagaggggcaggtcctggg

. . . . .
cctggcagcttcagatcccagggtccccagggtcaccactcgcccacctgtgccccag

      |1071      |1081      |1091      |1101      |1111      |1121
ATTACCAAGAGAACATGGGACAGGCTCTCAGCCCCGACATGCTGGCCACTGACCTTGCC
I H Q E N M G Q A L S P D M L A T D L A
      |361                      |371

      |1131      |1141      . . . . .
TATTACCTGGTCCGCAAAGGGtaagtgtgtagcagccagggggagggtgaggagatggg
Y Y L V R K G
      |381

. . . . .
gtgcccccccagagggtgggggagctcaggaatgggtgcaagcggcccagcctggtggc

. . . . .
tcaccctgtaatcccagcactttgggaagccgaggtgggcgggtcacttgaggccagga

. . . . .
gttcgagaccagcctggtcaacatggtgaaacccgtctcttttgatgtaaaaataaac

. . . . .
aattagctgggtgtg
```

Exon 16 | Start: 21769 | End: 21875 | Length: 106
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . .
tggcacactcctgtaatcccagttactcgggaggctgaggcaggagaattgattgaactg
. . . . .
ggaggtggagtttcggtgaggtgagatcgcgccactgcactccagcctgggcaacagag
. . . . .
cgagactttgtgtcaaaaagaaaaaaaaaaaaaaggaaggggtgcaggcaatggagg
. . . . .
cagatcagggcacatggagaaacctgcctcagcgccatcttcctccctggcaccagATGCC
                                     M P

|1151      |1161      |1171      |1181      |1191      |1201
ATTCCGCCAGGCCACGAGGCCTCCGGGAAAGCTGTGTTCATGGCCGAGACCAAGGGGT
F R Q A H E A S G K A V F M A E T K G V
                                     |391      |401

|1211      |1221      |1231      |1241      . . . .
CGCCCTCAACCAGCTGTCACTGCAGGAGCTGCAGACCATCAGgtacggcccatccccttc
A L N Q L S L Q E L Q T I S
                                     |411

. . . . .
cccatgtgcctcctaggaagtgagcctgggtgcctggagcccagggtggcctggcgccc
. . . . .
tggcccacctcttcctctctccccagccccctgttctcgggcgacgtgatctgcgtgtgg
. . . . .
gactacgggcacagtgtggagcagtatggtgccctgggcggcactgcgcgctccagcgtc
. . . . .
gactggcagatccgccaggtgcgggcgctactgcaggcacagcaggcctaggtcctcca
. . . . .
cacctgccccctaataaagtgggcgcgagaggaggctgctgt

```


Exon 17 | Start: 21980 | End: 22555 | Length: 575
 BE AWARE: Flanking intron is shared with the previous exon

```

. . . . . |1251
cctggagcccagggtggcctggcgccctggccacctcttctctctccccagCCCCCTG
                                     P L

      |1261      |1271      |1281      |1291      |1301      |1311
TTCTCGGGCGACGTGATCTGCGTGTGGGACTACGGGCACAGTGTGGAGCAGTATGGTGCC
F S G D V I C V W D Y G H S V E Q Y G A
      |421                      |431

      |1321      |1331      |1341      |1351      |1361      |1371
CTGGGCGGCACTGCGCGCTCCAGCGTCGACTGGCAGATCCGCCAGGTGCGGGCGCTACTG
L G G T A R S S V D W Q I R Q V R A L L
      |441                      |451

      |1381      |1391|*1      |*11      |*21      |*31      |*41
CAGGCACAGCAGGCCTAGGTCCTCCACACCTGCCCCCTAATAAAGTGGGCGGAGAGGA
Q A Q Q A *
      |461

      |*51      |*61      |*71      |*81      |*91      |*101
GGCTGCTGTGTGTTTCCTGCCCCAGCCTGGCTCCCTCGTTGCTGGGCTTTCGGGGCTGGC

      |*111      |*121      |*131      |*141      |*151      |*161
CAGTGGGGACAGTCAGGGACTGGAGAGGCAGGGCAGGGTGGCCTGTAATCCCAGCACTTT

      |*171      |*181      |*191      |*201      |*211      |*221
GGAAGGGCAAGGTGCGAGGATGCTTGAGGCCAGGAGTTTGACACAGCCTGGGCAACACAG

      |*231      |*241      |*251      |*261      |*271      |*281
GGAGACCCCCATCTCTACTCAATAATAAAACAAATAGCCTGGCGTGGTGGCCCATGCATA

      |*291      |*301      |*311      |*321      |*331      |*341
TAGTCCCAGCTACTTGTAAGGCTGAGGTGAGAGGACACTTG TGCC CAGGAGTGAGGCTG

      |*351      |*361      |*371      |*381      |*391      |*401
CAGTGAGCTATGATCACGCCACTGCATTCCAGCCTGGATAACAGAGTGAGAACCTATCTC

      |*411      |*421      |*431. . . . .
TAAAAATAAATAAATAAACGAAAAATAAAtggaagcggagaaaactgggcaagggaatg

. . . . .
agagtcgtagacgggaagggaagagggggctcccatcatagcctctgctctgtccaggcc

```

.
ccatccccttcagacagggtatcacagtgacctcctaggccaggagcgatggctcacgcc
.
tgtaatcctagcattttgggaggcctgggcaacaggaagactccaactaccatattaaaa
.
aaaacatgaatgaaagcaaaaacaaaacaactagccaaactgggcgcggtggctcacacc
.
tgtaatcccagcactgtaggaggctgagg

GBK Parser: Version: 1.3, Version Date: 11/02/2015
Reader: Version: 1.3, Version Date: 11/02/2015
Writer: Version: 1.3, Version Date: 11/02/2015
Control: Version: 1.3, Version Date: 11/02/2015