cDNA sequence: uc001qmq.1
Genomic sequence: hg38_chr12:4367226-4380728_rev

EMBL formatted genomic sequence (may be used as reference sequence within the Staden package)
cDNA sequence formatted with Showseq (from the EMBOSS package)
Duplications masked
Table of primers (for re-PCR)

Exon1: 211 bp, Product size 369
Exon2: 104 bp, Product size 241
Exon3: 441 bp, Product size 576

```
Exon1: 211 bp
OLIGO            start  len       tm      gc%    any     3'   rep seq
LEFT PRIMER       1056   20    59.73    50.00   4.00   2.00 11.00 AAGGAAAAGGCCAGTAAGGC
RIGHT PRIMER      1424   19    59.81    63.16   3.00   3.00 11.00 CTCCCCAAGCCTCCTGTAG
PRODUCT SIZE: 369, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 1.00
TARGETS (start, len)*: 1111,281
```

```
  1020 AGTCTAGGATCCTCACACCAGCTACTTGCAAGGGAGAAGGAAAAGGCCAGTAAGGCCTGG
       .....................          >>>>>>>>>>>>>>>>>>>>

  1080 GCCAGGAGAGTCCCGACAGGAGTGTCAGGTTTCAATCTCAGCACCAGCCACTCAGAGCAG
                                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

  1140 GGCACGATGTTGGGGGCCCGCCTCAGGCTCTGGGTCTGTGCCTTGTGCAGCGTCTGCAGC
       XXXXXX******************************************************

  1200 ATGAGCGTCCTCAGAGCCTATCCCAATGCCTCCCCACTGCTCGGCTCCAGCTGGGGTGGC
       ************************************************************

  1260 CTGATCCACCTGTACACAGCCACAGCCAGGAACAGCTACCACCTGCAGATCCACAAGAAT
       ************************************************************

  1320 GGCCATGTGGATGGCGCACCCCATCAGACCATCTACAGTGAGTAGGGCTTCAGGCTGGGA
       *********************************XXXXXXXXXXXXXXXXXXXXXXXXXXX

  1380 AGAAGGGGAGCACCCTTGTTGTCCATCTACAGGAGGCTTGGGGAGGTTGGGGACTAGACT
       XXXXXXXXXXX              <<<<<<<<<<<<<<<<<<<

  1440 GGAGGGCTAATCCAACCCTCCTAGCTTTCTGCCCAGGAACCACTTATTGTCTTtgtgtgt
                  ....................................
```

ADDITIONAL OLIGOS
```
                    start   len       tm      gc%    any     3'   rep seq

 1 LEFT PRIMER       1056   20    59.73    50.00   4.00   2.00 11.00 AAGGAAAAGGCCAGTAAGGC
   RIGHT PRIMER      1461   19    60.28    57.89   3.00   2.00 11.00 AGGAGGGTTGGATTAGCCC
   PRODUCT SIZE: 406, PAIR ANY COMPL: 3.00, PAIR 3' COMPL: 2.00

 2 LEFT PRIMER       1056   20    59.73    50.00   4.00   2.00 11.00 AAGGAAAAGGCCAGTAAGGC
   RIGHT PRIMER      1458   19    60.28    57.89   4.00   3.00 11.00 AGGGTTGGATTAGCCCTCC
   PRODUCT SIZE: 403, PAIR ANY COMPL: 3.00, PAIR 3' COMPL: 3.00

 3 LEFT PRIMER       1056   20    59.73    50.00   4.00   2.00 11.00 AAGGAAAAGGCCAGTAAGGC
   RIGHT PRIMER      1449   21    59.72    57.14   4.00   0.00 12.00 TTAGCCCTCCAGTCTAGTCCC
   PRODUCT SIZE: 394, PAIR ANY COMPL: 3.00, PAIR 3' COMPL: 2.00

 4 LEFT PRIMER       1056   20    59.73    50.00   4.00   2.00 11.00 AAGGAAAAGGCCAGTAAGGC
   RIGHT PRIMER      1455   20    58.60    55.00   4.00   1.00 11.00 GTTGGATTAGCCCTCCAGTC
   PRODUCT SIZE: 400, PAIR ANY COMPL: 3.00, PAIR 3' COMPL: 3.00
```

Statistics

	con sid ered	too many Ns	in tar get	in excl reg	bad GC%	no GC clamp	tm too low	tm too high	high any compl	high 3' compl	high lib sim	poly X	high end stab	ok
Left	351	0	0	0	0	22	31	231	3	19	9	0	0	36
Right	332	0	0	0	0	22	64	167	0	0	6	0	0	73

Pair Stats:
considered 3399, unacceptable product size 3388, ok 11
primer3 release 1.1.1

Exon2: 104 bp

OLIGO	start	len	tm	gc%	any	3'	rep	seq
LEFT PRIMER	7962	20	60.37	50.00	5.00	3.00	12.00	TTTCAGGAGGTGCTTGAAGG
RIGHT PRIMER	8202	25	58.81	36.00	6.00	1.00	12.00	TCTATGTCGTGTCAAAGAAATTAGG

PRODUCT SIZE: 241, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 0.00
TARGETS (start, len)*: 7996,174

```
 7920 CCACCCTTNAAATCAATCCAGGGAGGTTTCATGAAGGTAGGTTTTCAGGAGGTGCTTGAA
      ......                              >>>>>>>>>>>>>>>>>>>

 7980 GGTGGGAATTGGATNGCAATGAGTCTTTGCCCTGCCTGTTTTTCTCCATAGGTGCCCTGA
      >>              XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX*********

 8040 TGATCAGATCAGAGGATGCTGGCTTTGTGGTGATTACAGGTGTGATGAGCAGAAGATACC
      ************************************************************

 8100 TCTGCATGGATTTCAGAGGCAACATTTTTGGATCAGTGAGTTTCTTTTTTGTGTTGGTCA
      *******************************XXXXXXXXXXXXXXXXXXXXXXXXXXXX

 8160 CCATTTGCAAACAATTAACCTAATTTCTTTGACACGACATAGACTTTTCTAGCTTAACAA
      XXXXXXXXXX           <<<<<<<<<<<<<<<<<<<<<<<<<

 8220 TTCCATTTGCAGTGTACCCTGGTGACCTGTTTCCACTGATACTTCATGCAGTCTAAGTAT
                        .................................
```

ADDITIONAL OLIGOS

		start	len	tm	gc%	any	3'	rep	seq
1	LEFT PRIMER	7971	20	60.50	50.00	5.00	2.00	12.00	GTGCTTGAAGGTGGGAATTG
	RIGHT PRIMER	8202	25	58.81	36.00	6.00	1.00	12.00	TCTATGTCGTGTCAAAGAAATTAGG

PRODUCT SIZE: 232, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 0.00

2	LEFT PRIMER	7962	20	60.37	50.00	5.00	3.00	12.00	TTTCAGGAGGTGCTTGAAGG
	RIGHT PRIMER	8203	26	59.54	38.46	6.00	1.00	12.00	GTCTATGTCGTGTCAAAGAAATTAGG

PRODUCT SIZE: 242, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 0.00

3	LEFT PRIMER	7971	20	60.50	50.00	5.00	2.00	12.00	GTGCTTGAAGGTGGGAATTG
	RIGHT PRIMER	8203	26	59.54	38.46	6.00	1.00	12.00	GTCTATGTCGTGTCAAAGAAATTAGG

PRODUCT SIZE: 233, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 0.00

4	LEFT PRIMER	7962	20	60.37	50.00	5.00	3.00	12.00	TTTCAGGAGGTGCTTGAAGG
	RIGHT PRIMER	8201	24	57.15	37.50	4.00	1.00	12.00	CTATGTCGTGTCAAAGAAATTAGG

PRODUCT SIZE: 240, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 0.00

Statistics

	con sid ered	too many Ns	in tar get	in excl reg	bad GC%	no GC clamp	tm too low	tm too high	high any compl	high 3' compl	high lib sim	poly X	high end stab	ok
Left	258	8	0	0	0	27	64	93	0	2	3	0	0	61
Right	204	0	0	0	3	37	120	2	0	2	0	0	0	40

Pair Stats:
considered 958, unacceptable product size 950, ok 8
primer3 release 1.1.1

```
   --------------------------------------------------------------------------------

 Exon3: 441 bp
 OLIGO           start   len       tm     gc%    any     3'    rep seq
 LEFT PRIMER      9877    18    60.35   66.67   4.00   0.00  12.00 AGGAGGAGCTGGGGAGTG
 RIGHT PRIMER    10452    20    61.02   60.00   7.00   3.00  11.00 GACCTGGTCCTTGGGAAGAG
 PRODUCT SIZE: 576, PAIR ANY COMPL: 5.00, PAIR 3' COMPL: 0.00
 TARGETS (start, len)*: 9910,511

  9840 CAGAGCTTCAGGCCGGCTGGCACAAGCATGTGGCCCCAGGAGGAGCTGGGGAGTGGGTGG
                                        >>>>>>>>>>>>>>>>>>

  9900 GGCCCCCACTGCCAGCCTTCACGTGGTTCGCTCTTGTCCTTCCAGCACTATTTCGACCCG
            XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX**************

  9960 GAGAACTGCAGGTTCCAACACCAGACGCTGGAAAACGGGTACGACGTCTACCACTCTCCT
            ***********************************************************

 10020 CAGTATCACTTCCTGGTCAGTCTGGGCCGGGCNAAGAGAGCCTTCCTGCCAGGCATGAAC
            ***********************************************************

 10080 CCACCCCCGTACTCCCAGTTCCTGTCCCGGAGGAACGAGATCCCCCTAATTCACTTCAAC
            ***********************************************************

 10140 ACCCCCATACCACGGCGGCACACCCGGAGCGCCGAGGACGACTCGGAGCGGGACCCCCTG
            ***********************************************************

 10200 AACGTGCTGAAGNCCCGGGCCCGGATGACCCCGGCCCCGGCCTCCTGTTCACAGGAGCTC
            ***********************************************************

 10260 CCGAGCGCCGAGGACAACAGCCCGATGGCCAGTGACCCATTAGGGGTGGTCAGGGGCGGT
            ***********************************************************

 10320 CGAGTGAACACGCACGCTGGGGGAANGGGCCCGGAAGGCTGCCGCCCCTTCGCCAAGTTC
            ***********************************************************

 10380 ATCTAGGGTCGCTGGAAGGGCACCCTCTNTAACCCATCCCTCAGCAAACGCAGCTCTTCC
            ******XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX        <<<<<<<

 10440 CAAGGACCAGGTCCCTTGACGTTCCGAGGATGGGAAAGGTGACAGGGGCATGTATGGAAT
            <<<<<<<<<<<<<                                    .........

 10500 TTGCTGCTTCTCTGGGGTCCCTTCCACAGGAGGTCCTGTGAGAACCAACCTTTGAGGCCC
            ...................................................

 ADDITIONAL OLIGOS
                         start   len       tm     gc%    any     3'    rep seq

  1 LEFT PRIMER      9882    17    60.19   70.59   4.00   0.00  12.00 GAGCTGGGGAGTGGGTG
    RIGHT PRIMER    10452    20    61.02   60.00   7.00   3.00  11.00 GACCTGGTCCTTGGGAAGAG
    PRODUCT SIZE: 571, PAIR ANY COMPL: 3.00, PAIR 3' COMPL: 0.00

  2 LEFT PRIMER      9877    18    60.35   66.67   4.00   0.00  12.00 AGGAGGAGCTGGGGAGTG
    RIGHT PRIMER    10451    19    59.09   57.89   5.00   3.00  11.00 ACCTGGTCCTTGGGAAGAG
    PRODUCT SIZE: 575, PAIR ANY COMPL: 5.00, PAIR 3' COMPL: 0.00

  3 LEFT PRIMER      9877    18    60.35   66.67   4.00   0.00  12.00 AGGAGGAGCTGGGGAGTG
    RIGHT PRIMER    10449    20    62.26   60.00   4.00   2.00  11.00 CTGGTCCTTGGGAAGAGCTG
    PRODUCT SIZE: 573, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 0.00

  4 LEFT PRIMER      9876    17    59.40   70.59   4.00   0.00  12.00 CAGGAGGAGCTGGGGAG
    RIGHT PRIMER    10452    20    61.02   60.00   7.00   3.00  11.00 GACCTGGTCCTTGGGAAGAG
    PRODUCT SIZE: 577, PAIR ANY COMPL: 5.00, PAIR 3' COMPL: 0.00
```

```
  Statistics
           con   too    in    in               no    tm    tm  high  high  high         high
           sid  many   tar  excl   bad    GC   too   too   any    3'   lib  poly   end
          ered    Ns   get   reg   GC% clamp   low  high compl compl   sim     X  stab    ok
  Left    386     0     0     0    17    16     0   334     0     0     0     2     0    17
  Right   342     0     0     0     0    22    16   225     1     1     0     0     0    77
  Pair Stats:
  considered 34, unacceptable product size 27, ok 7
  primer3 release 1.1.1
```