

Genomic sequence: hg38 chr12:4433142-4446614 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: 346 bp, Product size 511  
Exon2: 104 bp, Product size 243  
Exon3: 177 bp, Product size 303

Exon1: 346 bp	start	len	tm	gc%	any	3'	rep	seq
LEFT PRIMER	948	17	61.10	58.82	3.00	3.00	9.00	AAATAAGCCCTGCCGC
RIGHT PRIMER	1458	20	60.97	55.00	2.00	1.00	12.00	CCCTTCACCTTTTAGCCCTG
PRODUCT SIZE: 511, PAIR ANY COMPL: 3.00, PAIR 3' COMPL: 1.00								
TARGETS (start, len)*: 1009,416								

[illegible]

960 GCCGCCATGCCGGAGGGGAGAAAAACAAGAAGGGCGGTATTTTATGGGCCATTAATTCTGA  
 >>>>>XXXXXXXXXXXX

1020 CCACGTGCCTGAGAGGCAAGGTGGATGGCCCTGGGACAGAAACTGTTCATCACTATGTCC  
XXXXXXXXXXXXXXXXXXXXX\*\*\*\*\*

1080 CGGGGAGCAGGACGTCTGCAGGGCACGCTGTGGGCTCTNGTCTTCTAGGCATCCTAGTG  
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1140 GGCATGGTGGNGCCCTCGCCTGCAGGCACCCGTGCCAACAACAGCTGCTGGACTCGAGG  
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1200 GGCTGGGGCACCTGCTGTCCAGGTCTCGCGNNGGGCTAGCTGGAGAGATTGCCGGGGTG  
\*\*\*\*\*

1260 AACTGGGAAAGTGGCTATTTGGTGGGGATCAAGCGGCAGCGGAGGCTCTACTGCAACGTG  
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1320 GGCATCGGCTTTCACCTCCAGGTGCTCCCCGACGGCCGGATCAGCGGNACCCACGAGGAG  
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1380 AACCCCTACAGTGAGTGCCAGCTGCANCCAGTCNGGACGCTTGGGGGTTTGGGCTCATGC  
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[illegible]

1500 AATGCTGCTCACCACCTTAGATGATTCCACGTGACCCTGCCTGGGTGCAAGCTCAATATAC  
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## ADDITIONAL OLIGOS

		start	len	tm	gc%	any	3'	rep seq
1	LEFT PRIMER	948	17	61.10	58.82	3.00	3.00	9.00 AAATAAGCCCCTGCCGC
	RIGHT PRIMER	1457	20	61.11	55.00	2.00	2.00	12.00 CCTTCACCTTTTAGCCCTGC
	PRODUCT SIZE: 510, PAIR ANY COMPL: 3.00, PAIR 3' COMPL: 2.00							
2	LEFT PRIMER	947	18	62.33	55.56	3.00	3.00	9.00 AAAATAAGCCCCTGCCGC
	RIGHT PRIMER	1458	20	60.97	55.00	2.00	1.00	12.00 CCCTTCACCTTTTAGCCCTG
	PRODUCT SIZE: 512, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 1.00							

3	LEFT PRIMER	947	17	58.66	52.94	2.00	2.00	9.00	AAAATAAGCCCCTGCCG
	RIGHT PRIMER	1458	20	60.97	55.00	2.00	1.00	12.00	CCCTTCACCTTTTAGCCCTG
	PRODUCT SIZE: 512, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 1.00								
4	LEFT PRIMER	947	18	62.33	55.56	3.00	3.00	9.00	AAAATAAGCCCCTGCCGC
	RIGHT PRIMER	1457	20	61.11	55.00	2.00	2.00	12.00	CCTTCACCTTTTAGCCCTGC
	PRODUCT SIZE: 511, PAIR ANY COMPL: 4.00, PAIR 3' COMPL: 2.00								

## Statistics

	con sid ered	too many Ns	in tar get	in excl reg	no bad GC%	tm clamp	tm too low	tm too high	high any compl	high 3' compl	high lib sim	poly X	high end stab	ok
Left	140	0	0	0	13	22	0	74	0	0	0	28	0	3
Right	210	20	0	0	0	16	22	106	0	2	0	0	0	44

Pair Stats:  
considered 143, unacceptable product size 138, ok 5  
primer3 release 1.1.1

OLIGO	start	len	tm	gc%	any	3'	rep	seq
LEFT PRIMER	2297	19	59.36	57.89	3.00	2.00	12.00	GACTGAGATGCCCTTGTCG
RIGHT PRIMER	2539	21	58.45	47.62	3.00	1.00	12.00	CAACTGTGTAAGCATCAAGCC

PRODUCT SIZE: 243, PAIR ANY COMPL: 5.00, PAIR 3' COMPL: 1.00

TARGETS (start, len)\*: 2343,174

2280 CTAGGAGAAGGGGGGATGGACTGAGTGCCCTTGTCGGCTCAAGTTCCCACTCTGATTGC  
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2340 ACAAGCCTTAGGTAAATGTGGCCCCCTTTCTTGTCAGGCCTGCTGGAAATTTCCACNGT  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX\*\*\*\*\*

2400 GGAGCGAGGCGTGGTGAGTCTCTTTGGAGTGAGAAGTGCCCTCTTCGTNGCCATGAACAG  
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2460 TAAAGGAAGATTGTACGCAACGGTGAGTTCACCAGGCCGGGAAGTGCCAGGTTTACAAG  
\*\*\*\*\*XXXXXXXXXXXXXXXXXXXXXXXXXXXX <

2520 GCTTGATGCTTACACAGTTGAAGAAAATAATATGAANTCCTGAGTAGAGAAGTGACTATC  
<<<<<<<<<<<<<<<<<<<<<<

2580 TAAATGGGAAGGAaaNgctgtgagaggagcctgtgaaagggaggggccttgacgttgt  
. . . . .

## ADDITIONAL OLIGOS

	start	len	tm	gc%	any	3'	rep	seq
1 LEFT PRIMER	2309	19	60.79	57.89	4.00	0.00	11.00	CTTGTCGGCTCAAGTCCC
RIGHT PRIMER	2539	21	58.45	47.62	3.00	1.00	12.00	CAACTGTGTAAGCATCAAGCC
PRODUCT SIZE: 231, PAIR	ANY	COMPL: 4.00, PAIR	3'	COMPL: 1.00				
2 LEFT PRIMER	2308	19	60.79	57.89	4.00	0.00	11.00	CCTTGTCGGCTCAAGTTCC
RIGHT PRIMER	2539	21	58.45	47.62	3.00	1.00	12.00	CAACTGTGTAAGCATCAAGCC
PRODUCT SIZE: 232, PAIR	ANY	COMPL: 4.00, PAIR	3'	COMPL: 2.00				
3 LEFT PRIMER	2307	19	60.79	57.89	4.00	1.00	11.00	CCCTTGTCGGCTCAAGTTC
RIGHT PRIMER	2539	21	58.45	47.62	3.00	1.00	12.00	CAACTGTGTAAGCATCAAGCC
PRODUCT SIZE: 233, PAIR	ANY	COMPL: 4.00, PAIR	3'	COMPL: 2.00				
4 LEFT PRIMER	2312	20	62.16	60.00	3.00	0.00	12.00	GTCGGCTCAAGTTCCCACTC
RIGHT PRIMER	2539	21	58.45	47.62	3.00	1.00	12.00	CAACTGTGTAAGCATCAAGCC
PRODUCT SIZE: 228, PAIR	ANY	COMPL: 4.00, PAIR	3'	COMPL: 2.00				

	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
Left	226	0	0	0	0	24	32	112	0	0	3	13	0
Right	182	23	0	0	9	19	111	4	0	0	1	0	0

Pair Stats:

considered 15, unacceptable product size 10, ok 5

primer3 release 1.1.1

OLIGO	start	len	tm	gc%	any	3'	rep	seq
LEFT PRIMER	12160	18	59.19	61.11	6.00	2.00	11.00	CTGGCATCTGCAGCACTC
RIGHT PRIMER	12462	20	59.16	40.00	6.00	2.00	12.00	CTGGTGCAAAATTTCAATCG
PRODUCT SIZE: 303, PAIR ANY COMPL: 5.00, PAIR 3' COMPL: 1.00								
TARGETS (start, len)*: 12188,247								

12480 CCTCCATGGCTTCTGAATCAGGCTTATCCTGTGCTTGGGGAGACCTCAGTTGTTTTCTT

		start	len	tm	gc%	any	3'	rep	seq
1	LEFT PRIMER	12159	17	60.27	64.71	6.00	3.00	11.00	GCTGGCATCTGCAGCAC
	RIGHT PRIMER	12462	20	59.16	40.00	6.00	2.00	12.00	CTGGTGCAAAATTTCAATCG
	PRODUCT SIZE:	304,	PAIR	ANY	COMPL:	5.00,	PAIR	3'	COMPL: 1.00
2	LEFT PRIMER	12158	18	61.35	61.11	6.00	3.00	11.00	AGCTGGCATCTGCAGCAC
	RIGHT PRIMER	12462	20	59.16	40.00	6.00	2.00	12.00	CTGGTGCAAAATTTCAATCG
	PRODUCT SIZE:	305,	PAIR	ANY	COMPL:	5.00,	PAIR	3'	COMPL: 1.00
3	LEFT PRIMER	12160	18	59.19	61.11	6.00	2.00	11.00	CTGGCATCTGCAGCACTC
	RIGHT PRIMER	12463	20	58.21	40.00	6.00	3.00	12.00	GCTGGTGCAAAATTTCAATC
	PRODUCT SIZE:	304,	PAIR	ANY	COMPL:	5.00,	PAIR	3'	COMPL: 1.00
4	LEFT PRIMER	12163	18	58.07	61.11	6.00	1.00	12.00	GCATCTGCAGCACTCCTC
	RIGHT PRIMER	12462	20	59.16	40.00	6.00	2.00	12.00	CTGGTGCAAAATTTCAATCG
	PRODUCT SIZE:	300,	PAIR	ANY	COMPL:	5.00,	PAIR	3'	COMPL: 1.00

	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	338	0	0	0	0	22	7	270	0	5	4	0	0	30

1/26/2018

ExonPrimer

Right	278	0	0	0	0	28	36	162	0	3	0	0	0	49
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Pair Stats:

considered 300, unacceptable product size 293, high end compl 1, ok 6

primer3 release 1.1.1

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