

APPENDIX 1. Primers Used for Amplification and Sequencing

Primers Used for Amplification and Sequencing of *FBN1*

Primer Name	Primer Sequence (5'-3')	Annealing temperature (°C)	Product Length (bp)
Exon-1-F	TCGGGGATTGTCTCTGTGT	Touchdown #	558
Exon-1-R	AAATCTCTGGGAGTAGGGGC		
Exon-2-F	TCCAAGCTACCAACCCAG	Touchdown	454
Exon-2-R	AGCAAAGTATCCCCGTGACT		
Exon-3-F	TTGTGAGGGACCTGAGAACC	Touchdown	372
Exon-3-R	GAGGCCAGATGAAGGAAAGC		
Exon-4-F	TTTAGTAGGGACGGGGTTCC	Touchdown	532
Exon-4-R	CACTGGACACTTGTAACATGC		
Exon-5-F	ACCGTCCAAAACAAACACCA	Touchdown	340
Exon-5-R	ATCCCCTCAAAGCTCAGCAA		
Exon-6-F	GGAGTCAAGCAAGATGGAGC	Touchdown	386
Exon-6-R	GCTGACACTACTTTTCCATTCTC		
Exon-7-F	TGTGATGGACAAATAACTCACCG	Touchdown	371
Exon-7-R	TCACAGGGATGACAAAGACAGA		
Exon-8-F	TCCAGGGACATGATTTGACTAGT	Touchdown	400
Exon-8-R	AGGTGCCTCTGTTCTTTAAGAG		
Exon-9-F	CGTAGCCCCAGTGTGAAGTA	Touchdown	399
Exon-9-R	TTCCCTGGACGTCATCTCTT		
Exon-10-F	AGTTGACCTGTGAATTTTGAGGA	Touchdown	578
Exon-10-R	ATCGCCCATAACTCTCCCAT		
Exon-11-F	CAGACGACCTTTGCCCAA	Touchdown	486
Exon-11-R	CACCAAAAGGAAGACAGCCC		
Exon-12-F	TGCTCAACCAGTCTTCAAATGG	Touchdown	424
Exon-12-R	AAAAGCCACGGGACTGTATT		
Exon-13-F	ACCAAAAGCCAAGATCATGAGT	Touchdown	480
Exon-13-R	TGCCACAGAAGTTTCATCACA		
Exon-14-F	TGTCCCATCTTCTCCTTCCT	Touchdown	398
Exon-14-R	GGTACTTTAAGTGGGGAGAATCA		
Exon-15-F	TGCCATTTGAGCTTTTGTTGC	Touchdown	397
Exon-15-R	CCCTGTTGGTTTGTTGCTCT		
Exon-16-F	CCGATATCAGAGGCATTCCC	Touchdown	389
Exon-16-R	ACCTGGAGAGCAAAATGTCA		
Exon-17-F	TGGTTCTACTCACTTTGGAGGA	Touchdown	300
Exon-17-R	AGCATCCCAGATACATGGCA		
Exon-18-F	TCCTCCTGTAGCTCCTAAGG	Touchdown	340
Exon-18-R	TTTGCCCAGTCCTCTAAGCT		
Exon-19-F	TGCTACAGGAGTTTTGCCTT	Touchdown	400
Exon-19-R	GTGCCATGTAGAACCACAGA		
Exon-20-F	GCTTTACTGTGTGGGATTAAGGA	Touchdown	483

Exon-20-R	CGCCCATCAATGACAGTCTG		
Exon-21-F	CCTTGCATTAATGGAGTCTGCA	Touchdown	583
Exon-21-R	TTCAGCAATATGTTTCGGGGC		
Exon-22-F	TCATGTTCCAGGTCATCTTTCA	Touchdown	270
Exon-22-R	TGCTGCATATTTCTCCCTGTG		
Exon-23-F	ACCAGGTTCAAAATGGGGAA	Touchdown	371
Exon-23-R	GAGTGGCCATGGACCTATC		
Exon-24-F	GGATACTTACCCCAGAGCCT	Touchdown	582
Exon-24-R	CAGGACTTCTTGGACCAAACA		
Exon-25-26-F	TGGATCATCACACATTCTTGGA	Touchdown	641
Exon-25-26-R	AACTTCACTGGTTGCACTGG		
Exon-27-28-F	TAGCACCAGAGAGTTGTCCC	Touchdown	632
Exon-27-28-R	GCGATGAAAACAAAACTCAGAGT		
Exon-29-F	ATAACAGCACCGATCCCACC	Touchdown	378
Exon-29-R	CTGCTTGACTCCAAAGCCTG		
Exon-30-F	GGCTAAGTTTATTTGACTGCGG	Touchdown	381
Exon-30-R	GCTCTCTTTGGAATGCTGGT		
Exon-31-F	GCCAGATGAAAGCCAGTCTG	Touchdown	666
Exon-31-R	TCGGTGAAGGGCCATGAATA		
Exon-32-F	CCATGGGAAGTTTGAAGGCA	Touchdown	395
Exon-32-R	TGGAACATTCGTCCAGATCTT		
Exon-33-F	GGGTGGATTGGAGATGGCAT	Touchdown	494
Exon-33-R	CGAGAAGCTTTTGAGGTCTCC		
Exon-34-F	TCAGTGTTAGCCTACCAAAGAGA	Touchdown	396
Exon-34-R	TGAAGCTAAAACACACCTCAGT		
Exon-35-F	ATAGGAGAAGTGCCCAGATTG	Touchdown	372
Exon-35-R	CCCCTTGCTTTTCTTGCTTCT		
Exon-36-F	GTGGAAGACTGCATTTCTAGATG	Touchdown	438
Exon-36-R	ACTACCGAGAATTTTCCCTATGG		
Exon-37-F	GGTAGTGATAATGTTTCATGGGC	Touchdown	434
Exon-37-R	TCTACAGGGCTGAGAGGACT		
Exon-38-39-F	TCAGACGGGCAGAGTAACAA	Touchdown	560
Exon-38-39-R	TCTACCTGGCTATGTTTCGTGT		
Exon-40-F	ACAGAGAGAGGACACGGATG	Touchdown	396
Exon-40-R	ATGCCAGCACTCAGTCTGAT		
Exon-41-F	TCTTGTAGCAGCATAGGTAGCT	Touchdown	520
Exon-41-R	TGTGACTCAGTGTTTCGGCT		
Exon-42-F	GGCACTCTTACCAGTCCCTG	Touchdown	690
Exon-42-R	CTCTCCCCATGTTGATGCCT		
Exon-43E-F	GCACGCACTTTCCATCTTGT	Touchdown	287
Exon-43E-R	TGTGAAATTCGCCAAGTGTGT		
Exon-44-F	TCATGTGAGAGGCTTTGTTGAC	Touchdown	485
Exon-44-R	GTGAGTGTTTGCAGGCAGG		
Exon-45-F	ACTCTGACTATGCCTGGTAAATG	Touchdown	450

Exon-45-R	TCACTGCTGCATATCTGTCTG		
Exon-46-F	CTATGGATGAGGCCTGGTGA	Touchdown	419
Exon-46-R	CCTCACGGATAAGGGGAGAC		
Exon-47-F	AGCCAGTTCTGTTGTTGCAA	Touchdown	398
Exon-47-R	CCAGGTTTCCAGAAAGAAGCA		
Exon-48-F	ACTCACTGACTTTTCACATGCT	Touchdown	551
Exon-48-R	GTGCTTCTTGTCTTGCCAGA		
Exon-49-F	AGAAGTCCAGTCCACAGTGT	Touchdown	394
Exon-49-R	ACTCTCCATCTTCCTGTTTACA		
Exon-50-F	AGGAGTATTGCTGTGGTCCT	Touchdown	480
Exon-50-R	ACTCCTTGGGCATCTGTGAT		
Exon-51-F	TTCCTCTGGTTTCTGGGCTT	Touchdown	475
Exon-51-R	TCGGGTTCTTTGCATTCGTC		
Exon-52-F	TTCAGCAGTTGGTCAGTTGC	Touchdown	584
Exon-52-R	TCTTTGTGGTTCAGTGCTGC		
Exon-53-F	TGCAGTCTGGATGTCAAAGTG	Touchdown	396
Exon-53-R	AGAATGATCAAATGGCCCATCA		
Exon-54-F	GGAGACCACTTGATCCATCCA	Touchdown	362
Exon-54-R	TCCAATTCCCAGCCTTCTCC		
Exon-55-F	GCAGAAGGAAATACAGCCAGT	Touchdown	382
Exon-55-R	AGAACAAAATGGGTCTCGCC		
Exon-56-F	GGAACAAAGGGAGGGAAGGA	Touchdown	392
Exon-56-R	CACAGTCATTACGGCATCTCC		
Exon-57-F	AGCTTTCCCCTCTTGCTTCT	Touchdown	459
Exon-57-R	CTGTGCAATTCAACCTAGGCA		
Exon-58-F	GGGGTGGCTGTTCTATGGAT	Touchdown	543
Exon-58-R	TGATTGTCCTGTGCTTTCCT		
Exon-59-F	AGCACAGGACAATCATCAAAGT	Touchdown	400
Exon-59-R	TGGAGGCATTAACCCCAGG		
Exon-60-61-F	CAAACGTGGAGCTGCTTCAT	Touchdown	683
Exon-60-61R	GAGGCTGATGATGAAGGTGC		
Exon-61E-F-2	GTGAAGCGTTGTTGGCCTTA	Touchdown	334
Exon-61E-R-2	GAGGCTGATGATGAAGGTGC		
Exon -62-F	GCAGCAGTTCCAGAAGAGAG	Touchdown	400
Exon-62-R	TCAACCAGGTTAGGGCAATT		
Exon-63-F	TACCTTCCTGAGAGCCTAGC	Touchdown	494
Exon-63-R	CTTTTGCCAAGCTAACTGGAAT		
Exon-64-F	TCCTCCAGTGGACAAGCAAG	Touchdown	478
Exon-64-R	AGAAACTCCAGAAAGCCCCA		
Exon-65a-F	ACCTGCCTTTCTTCCTGACA	Touchdown	577
Exon-65a-R	CAGATTATCACCCAGTTCACCAC		
Exon-65b-F	TCCCACGTCAGTAACAAGGT	Touchdown	476
Exon-65b-R	GTCACCTGTACCTTGCTTTGG		

Primers Used for Amplification and Sequencing of *ADAMTS10*

Primer Name	Primer Sequence (5'-3')	Annealing Temperature (°C)	Product Length (bp)
Exon-1F	AGAGTCAGGTGAAAAGCTTTGG	Touchdown	499
Exon-1R	CCCTGTGTCTCTGGCTGTTAG		
Exon-2F	ACAGAAAGAGGCATCAGGGG	Touchdown	694
Exon-2R	TTTAGCTGCATCCCCAAAGC		
Exon-3F	GAGCTACGATTGCACCACTG	Touchdown	500
Exon-3R	CCTCACATAACTGCCTGCTG		
Exon-4F	GAAGGCAGCAGAATGACCAG	Touchdown	480
Exon-4R	CTTTCTACCCCTGTCCCCAC		
Exon-5-6F	CCTAAGACCCGACACACAGT	Touchdown	551
Exon-5-6R	CCTCCTGACCCTAGCAGAAG		
Exon-7-8F	TTCAGGTGAGAGGCAGATGG	Touchdown	500
Exon-7-8R	TTCATGCCGAATCTGGGGA		
Exon-9-10F	TTCACCATTTGCCACGAGAT	Touchdown	689
Exon-9-10R	CTTCCCGGTTCTCCCACC		
Exon-11F	CAAGGGGATGCACGAAGAC	Touchdown	369
Exon-11R	GGGAGCAGATAATAGGCCGA		
Exon-12F	CTGTTTCGCATGTTTCAGACCC	Touchdown	388
Exon-12R	GGTTGGCCTGGAAAGGGT		
Exon-13F	TGTCCTCTTCTAGCCGTCAC	Touchdown	343
Exon-13R	CCAGGATGGTCTCGATCTCC		
Exon-14F	TCTAGCCTCCCTCCTCCAG	Touchdown	350
Exon-14R	CCATGGTACCGTATCCCAGG		
Exon-15-16F	CTCTTGGGTCTGGGGTCTG	Touchdown	555
Exon-15-16R	CCTGGGGTCTGAGGAGTTAG		
Exon-17-18F	AGGGGTGCAGTTAGATGTGT	Touchdown	644
Exon-17-18R	CATAGTGCCAGGAGTAGGGG		
Exon-19-20F	AAGCCCTGGGACCGATTAAT	Touchdown	585
Exon-19-20R	TCACTCCGACTCTGCACTAA		
Exon-21F	ATGAGGCTGGGTGATTGGAA	Touchdown	414
Exon-21R	AAGTGAGGAGGGGACAGCTA		
Exon-22-23F	CTTCCTTCGCGCCCACTG	Touchdown	675
Exon-22-23R	GCAGAGACACAGCAATGCAT		
Exon-24F	CCAAGGCACAGAAAGTCACT	Touchdown	324
Exon-24R	CACCCTTCCCTCCCAGTTC		

Primers Used for Amplification and Sequencing of *ADAMTSL4* as previously described[7], the alternative primer as follows

Primer Name	Primer Sequence (5'-3')	Annealing Temperature (°C)	Product Length (bp)
Exon-6b-F	GCAGAACCTCTAAGCCCTGA	Touchdown	572
Exon-6b-R	GAGGTGGTCAGATGCCAAG		
Exon-8-F	CCTTCATCCACAGTGACCTG	Touchdown	585
Exon-8-R	TGAGACTGTGCAAATACGTGTG		
Exon-14-F	AACGTGCCCACTCTCCTCT	Touchdown	485
Exon-14-R	GTCCCTGGTTCAGTCCCTTA		

Primers Used for Amplification and Sequencing of *TGFBR2*

Primer Name	Primer Sequence (5'-3')	Annealing Temperature (°C)	Product Length (bp)
Exon-1F	ATCTGGCCCGCACATCTG	Touchdown	400
Exon-1R	CACAATCCCTGCAGCTACG		
Exon-2F	TGAGACATATGGGTGAAAGATCA	Touchdown	445
Exon-2R	GATGAGTACACTGCCATCGC		
Exon-3F	AATGGCTACTCAACCACCCC	Touchdown	585
Exon-3R	ACATGCAGAGAACACCCCTA		
Exon-4F	CAGCTGCCGTTGTTAGGAAC	Touchdown	492
Exon-4R	AAACCCTGCTACTCCCCAAG		
Exon-5aF	ATGACGAACAGATGGCCAGA	Touchdown	700
Exon-5aR	TTTCCCCAACTCCGTCTTCC		
Exon-5bF	TGCCAACAACATCAACCACA	Touchdown	673
Exon-5bR	CCAGTGTCCAGAGTACAGGG		
Exon-6F	AGAGGGTTTTTCAGGGAGAGA	Touchdown	493
Exon-6R	CCAAATAGTTCTGGGATGGTTGT		
Exon-7F	CCCAACCACTCCTTCCTTCT	Touchdown	429
Exon-7R	ACAGGGCCATAGAACACAATG		
Exon-8F	ACCCTGCTTGCACTCACTAT	Touchdown	460
Exon-8R	TGCTCTATGTCACCCACTCC		

Primers Used for Amplification and Sequencing of *CBS*

Primer Name	Primer Sequence (5'-3')	Annealing Temperature (°C)	Product Length (bp)
Exon-1F	CTTCCTGGGCTTCTCTGAGG	Touchdown	499
Exon-1R	TCAGAGCCTCATCTACACGG		
Exon-2F	ACCACCCAGATAAAGCCAGT	62	388
Exon-2R	GCCACTCATTAACCAGCGAG		
Exon-3F	TTTCAGAACCCACAGACCCC	62	396
Exon-3R	AAGATGCCAGGGAGCAGG		
Exon-4-5F	ATCCCACAGAACCCTCTTCC	Touchdown	545
Exon-4-5R	TAGAAAGAGAGCAGAGCCCG		
Exon-6F	GGCTGAAGAACGAAATCCCC	Touchdown	345
Exon-6R	AGGGAACATTTGAGCTGGGT		
Exon-7F	CTTTCACAGACCAAGGGCAG	Touchdown	400
Exon-7R	TCTTCCCAAACACCTCCCAG		
Exon-8F	TTGGGTTTCTCATCCTGCCT	Touchdown	398
Exon-8R	TCAGTGGAGAAGCTGGTTGG		
Exon-9F	GGTCCTACCGCCTAGACAC	Touchdown	295
Exon-9R	TCTTACACATGCAGGTCGGT		
Exon-10F	TGTGTCTGACATGCTCCCAT	Touchdown	320
Exon-10R	CTCCTCCCCTCCCAGTTCT		
Exon-11-12F	CAGTGAGGTCCAGGAGAGG	Touchdown	721
Exon-11-12R	TGCCCTGAACGTCTGTATGA		
Exon-13F	GTTTCTTTCTCCCCACCAGG	Touchdown	825
Exon-13R	CGAAGTGCCTGAGTACCTGT		
Exon-14F	GGGTGGGCTTTGCAGGAC	Touchdown	298
Exon-14R	CACTCCCCTAACACCCCG		
Exon-15F	GGAGTCTGAGGCACGAGAAT	Touchdown	494
Exon-15R	GTGTGCAGGGATAACGGTG		

Touchdown PCR amplification consisted of a denaturizing step at 95°C for 5 minutes, followed by 35 cycles of amplification (at 95°C for 30 seconds, at 65~58°C for 30 seconds starting from 65°C with decreasing by 0.5°C every cycle for 14 cycles until remaining at 58°C for 21 cycles, and at 72°C for 40 seconds), and a final extension at 72°C for 10 minutes.