**Supplementary data1**. Primers of 25 hub genes

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| Genes | Aceesssion no. | Forward Primer | Reverse Primer |
| COL1A2 | NM\_000089 | 5'-GGCCCTCAAGGTTTCCAAGG-3' | 5'-CACCCTGTGGTCCAACAACTC-3' |
| COL1A1 | NM\_000088 | 5'-GAGGGCCAAGACGAAGACATC-3' | 5'-CAGATCACGTCATCGCACAAC-3' |
| COL6A3 | NM\_057166 | 5'-CATAACCGCTGTGCGGAAAAT-3' | 5'-TCATCTAGGGACTTACCACCTG-3' |
| COL3A1 | NM\_000090 | 5'-TTGAAGGAGGATGTTCCCATCT-3' | 5'-ACAGACACATATTTGGCATGGTT-3' |
| COL5A2 | NM\_000393 | 5'-GACTGTGCCGACCCTGTAAC-3' | 5'-CCTGGACGACCACGTATGC-3' |
| COL5A1 | NM\_000093 | 5'-GCCCGGATGTCGCTTACAG-3' | 5'-AAATGCAGACGCAGGGTACAG-3' |
| COL4A1 | NM\_001845 | 5'-GTGTTGACGGCTTACCTGGAGAC-3' | 5'-CGGGAAGACCTGGCAAACCTTT-3' |
| COL4A2 | NM\_001846 | 5'-TTATGCACTGCCTAAAGAGGAGC-3' | 5'-CCCTTAACTCCGTAGAAACCAAG-3' |
| COL4A3 | NM\_000091 | 5'-GCAGTGGTTCTAAGGGTGAGC-3' | 5'-GAAAGCCAAAGAATCCCGGAG-3' |
| COL4A4 | NM\_000092 | 5'-TCGGTGGCTTCCTCCTGGTT-3' | 5'-ATCTGTCGTTTCTCTGGGCATAGTG-3' |
| DCN | NM\_133506 | 5'-ATGAAGGCCACTATCATCCTCC-3' | 5'-GTCGCGGTCATCAGGAACTT-3' |
| COL14A1 | NM\_021110 | 5'-CACTTCCTACACGACCACCAACTT-3' | 5'-GGTTCCATCTGTGCCAATCTTGTTC-3' |
| LUM | NM\_002345 | 5'-TAACTGCCCTGAAAGCTACCC-3' | 5'-GGAGGCACCATTGGTACACTT-3' |
| COL15A1 | NM\_001855 | 5'-CTGCAGAAAGCGCATTTGGT-3' | 5'-GTGGAGGCAGAAGCTGATGT-3' |
| THBS2 | NM\_003247 | 5'-ATAGACAGCTTCGCTCTGGAC-3' | 5'-CAAACCCCTGAAGTGACTCTC-3' |
| FBN1 | NM\_000138 | 5'-TTTAGCGTCCTACACGAGCC-3' | 5'-CCATCCAGGGCAACAGTAAGC-3' |
| ITGB8 | NM\_002214 | 5'-ACCAGGAGAAGTGTCTATCCAG-3' | 5'-CCAAGACGAAAGTCACGGGA-3' |
| CDH11 | NM\_001797 | 5'-AGAGGTCCAATGTGGGAACG-3' | 5'-GGTTGTCCTTCGAGGATACTGT-3' |
| ADAMTS2 | NM\_021599 | 5'-GACACGGGCCACGATGAATA-3' | 5'-GGTGACAGGAGCATAGCCTT-3' |
| CTGF | NM\_001901 | 5'-AAAAGTGCATCCGTACTCCCA-3' | 5'-CCGTCGGTACATACTCCACAG-3' |
| VCAN | NM\_001126336 | 5'-GTAACCCATGCGCTACATAAAGT-3' | 5'-GGCAAAGTAGGCATCGTTGAAA-3' |
| PCOLCE2 | NM\_013363 | 5'-TGCCGCTATGACTTTGTGGAT-3' | 5'-GGCATCAGAAATCATCTGCACC-3' |
| SPP1 | NM\_001251830 | 5'-GAAGTTTCGCAGACCTGACAT-3' | 5'-GTATGCACCATTCAACTCCTCG-3' |
| VWF | NM\_000552 | 5'-CCGATGCAGCCTTTTCGGA-3' | 5'-TCCCCAAGATACACGGAGAGG-3' |
| CTSK | NM\_000396 | 5'-ACTCAAAGTACCCCTGTCTCAT-3' | 5'-CCACAGAGCTAAAAGCCCAAC-3' |

The primers were downloaded from Primerbank or designed with Primer6 and verified by Oligo7.