Supplementary table 1: Genes associated with arterial aneurysm or dissection. Associated vascular phenotypes were found in the OMIM (online Mendelian Inheritance in Man) database.

Gene symbol	Description	Associated vascular phenotype	OMIM No.
ACTA2	Actin, Alpha 2, Smooth Muscle, Aorta	Aortic aneurysm, familial thoracic 6	611788
COL3A1	Collagen Type III Alpha 1 Chain	Ehlers-Danlos syndrome, vascular type	130050
COL4A1	Collagen Type IV Alpha 1 Chain	Hereditary Angiopathy with nephropathy, aneurysms, and muscle cramps	611773
COL4A3	Collagen Type IV Alpha 3 Chain	Alport syndrome, autosomal recessive	203780
COL4A4	Collagen Type IV Alpha 4 Chain	Alport syndrome, autosomal recessive	203780
COL4A5	Collagen Type IV Alpha 5 Chain	Alport syndrome, X-linked	301050
COL5A1	Collagen Type V Alpha 1 Chain	Ehlers-Danlos syndrome, classic type, 1	130000
COL5A2	Collagen Type V Alpha 2 Chain	Ehlers-Danlos syndrome, classic type, 2	130010
EFEMP2	EGF Containing Fibulin Extracellular Matrix Protein 2	Cutis laxa, autosomal recessive, type IB	614437
ELN	Elastin	Cutis laxa, autosomal dominant 1	123700
FBN1	Fibrillin 1	Marfan syndrome	154700
FBLN5	Fibulin 5	Cutis laxa, autosomal recessive, type IA	219100
FLNA	Filamin A	Periventricular nodular heterotopia 1	300049
FOXE3	Forkhead Box E3	Aortic aneurysm, familial thoracic 11, susceptibility to	617349
LOX	Lysyl Oxidase	Aortic aneurysm, familial thoracic 10	617168
MFAP5	Microfibril Associated Protein 5	Aortic aneurysm, familial thoracic 9	616166
MYH11	Myosin Heavy Chain 11	Aortic aneurysm, familial thoracic 4	132900
MYLK	Myosin Light Chain Kinase	Aortic aneurysm, familial thoracic 7	613780
NOTCH1	Notch 1	Aortic valve disease 1	109730
PLOD1	Procollagen-Lysine,2-Oxoglutarate 5-Dioxygenase 1	Ehlers-Danlos syndrome, kyphoscoliotic type, 1	225400

PLOD3	Procollagen-Lysine,2-Oxoglutarate 5-Dioxygenase 3	Bone fragility with contractures, arterial rupture, and deafness	612394
PRKG1	Protein Kinase CGMP-Dependent 1	Aortic aneurysm, familial thoracic 8	615436
SKI	SKI Proto-Oncogene	Shprintzen-Goldberg syndrome	182212
SLC2A10	Solute Carrier Family 2 Member 10	Arterial tortuosity syndrome	208050
SMAD3	SMAD Family Member 3	Loeys-Dietz syndrome 3	613795
SMAD4	SMAD Family Member 4	Hereditary hemorrhagic telangiectasia syndrome	175050
TGFB2	Transforming Growth Factor Beta 2	Loeys-Dietz syndrome 4	614816
TGFB3	Transforming Growth Factor Beta 3	Loeys-Dietz syndrome 5	615582
TGFBR1	Transforming Growth Factor Beta Receptor 1	Loeys-Dietz syndrome 1	609192
TGFBR2	Transforming Growth Factor Beta Receptor 2	Loeys-Dietz syndrome 2	610168