**Supplementary Table 5.** the list of known genes associated with vascular malformation

|  |  |  |  |
| --- | --- | --- | --- |
| Gene symbol | | | |
| *MAP3K3* | *ENG* | *NAGA* | *VEGFB* |
| *ET* | *EPHB4* | *NEMO* | *VEGFR3* |
| *BMP9* | *EPO* | *NOTCH1* | *VEGFR2* |
| *MADH4* | *F5* | *PCNA* | *VEGFC* |
| *ALK1* | *FAM111B* | *PDCD10* | *VG5Q* |
| *ACE* | *FLT1* | *PIEZO1* | *RNF213* |
| *AKT1* | *FLT4* | *PIK3CA* | *NOTCH3* |
| *ACTA2* | *FLVCR2* | *PIK3R2* | *HTRA1* |
| *ACVRL1* | *FOXF1* | *PON1* | *VEGF* |
| *ANGPT1* | *FOXC2* | *PTEN* | *TGFBR1* |
| *ANTXR1* | *GDF2* | *RASA1* | *TGFBR2* |
| *ARHGAP31* | *GLMN* | *SLC7A14* | *ACVLR1* |
| *ATM* | *GNAQ* | *SLC2A10* | *IL1b* |
| *ATR* | *GLOMULIN* | *SMAD4* | *ITGB8* |
| *BMPR2* | *GUCY1A1* | *SNORD118* | *ANGPTL4* |
| *CCM2* | *IKBKG* | *SNRK* |  |
| *CCM1* | *IGFBP7* | *SOX18* |  |
| *CCM3* | *IL1RN* | *STAMBP* |  |
| *CCND2* | *IL6* | *STN1* |  |
| *CLEC14A* | *IDH1* | *TALDO1* |  |
| *COL4A1* | *IDH2* | *TEK* |  |
| *CTC1* | *JAK2* | *TIE1* |  |
| *CTD* | *KDR* | *TIE2* |  |
| *DLL4* | *KRAS* | *TMEM173* |  |
| *DOCK6* | *KRIT1* | *TREX1* |  |
| *DUSP5* | *LBR* | *VHL* |  |
| *EIF2AK4* | *MGC4607* | *VASN* |  |
| *ELMO2* | *MRE11* | *VEGFA* |  |