Table S1 Primers used for sequencing of *PROC* and *SERPINC1* gene

	Forward primer	Reverse primer	Product size (bp)
PROC			
Exon 1	5' GCTGGACGGCATCCTTGGT 3'	5' AAGGGACCTGAGACTGTGGCT 3'	396
Exon 2	5' GACAGCCCTTTCATTCCG 3'	5' TTCCTGCCATTCCCATCT 3'	316
Exon 3	5' CGCCAAGCCATGACCTAG 3'	5' CATCCTAATCGCTCCACTCA 3'	458
Exon 4-5	5' CCTAGCAGCCAACGACCATC 3'	5' GCCCACCTCCTCTAGGCAGTA 3'	574
Exon 6	5' GAGGGGGAGAGGTGGATG 3'	5' GCTCAACTCTGTTCCTCGCTCC 3'	360
Exon 7	5' AGTGGTCTAAGTATCATTGGTT 3'	5' CAGGTTGCGTCCATCTTT 3'	442
Exon 8	5' GCAAAGGCAGGAAGACACC 3'	5' CAGGGTGGGGGCACATAG 3'	473
Exon 9	5' CTCCGTGACTCCTGAAAACC 3'	5' GGCTCCACCATGTAAACCTT 3'	1332
SERPINC1			
Exon 1	5' GGTGTAACCATTGTGTTTTC 3'	5' GTCATTCCTGTGAGTCCTT 3'	639
Exon 2	5' GGATTTAGCCTTTCTCTTGG 3'	5' GGTTGAGGAATCATTGGACT 3'	579
Exon 3	5' CATCAGAACACAAGAGTTGAGCAT 3'	5' GCCCTCCAGCAGTCTTCA 3'	497
Exon 4	5' TTAGATATGTGAGGCTTCCC 3'	5' ATTGACCTGCCCTGCTGA 3'	448
Exon 5	5' CAATAACTATCCTCCTATGAATGT 3'	5' TGCGGGTGGAGAAGGGAG 3'	484
Exon 6	5' GTGAGAGTATGATTAGGTGAAGAT 3'	5' GGAGGGAAGGCAGAACAA 3'	383
Exon 7	5' GACCCAAATGTACTTTTTACTG 3'	5' TGTCTACCATCTTTTATCGC 3'	538

Table S2 Summary for mutations of *SERPINC1* gene reported in Chinese

Mutation type	Nucleotide change	Amino acid change	AT:A level	AT:Ag level	Reference
Nonsense	c.490C>T	p.Arg164*	Low	Low	[1]
Nonsense	c.211A>T	p.Lys71*	Low	Low	[1]
Nonsense	c.6T>A	p.Tyr2*	Low	Low	[1]
Nonsense	c.229_236delinsGGGA	p.Asn77Glyfs*35	Low	Low	[1]
Splicing	c.41+2T>C	-	Low	Low	[1]
Deletion	c.1066_1083del	p.Arg356_Phe361del	Low	Low	[1]
Missense	c.641C>A	p.Ser214Tyr	Low	Low	[1]
Deletion	c.1066_1083del	p.Arg356_Phe361del	Low	Low	[1]
Nonsense	c.116_123del	p.Ile39Serfs*25	Low	Low	[1]
Nonsense	c.484_485del	p.Tyr163Serfs*25	Low	Low	[1]
Deletion	c.1030_1032del	p.Glu344del	Low	Low	[1]
Nonsense	c.1016G>A	p.Trp339*	Low	Low	[1]
Missense	c.719A>G	p.Asn240Ser	Low	Low	[1]
Nonsense	c.849_853dupGATGT	p.Met284Metfs*1	Low	Low	[1]
Missense	c.458T>A	p.Phe153Tyr	Normal	Normal	[1]
Missense	c.491G>A	p.Arg164Gln	Normal	Normal	[1]
Missense	c.598G>C	p.Ala200Pro	Normal	Normal	[1]
Missense	c.883G>A	p.Val295Met	Normal	Normal	[1]
Missense	c.1277C>T	p.Ser426Leu	Normal	Normal	[1]
Deletion	c.86_87delinsCT	p.Cys29Ser	Normal	Normal	[1]
Missense	c.880C>T	p.Arg294Cys	Normal	Normal	[1]
Missense	c.883G>A	p.Val295Me	Normal	Normal	[1]
Missense	c.938T>C	p.Met313Thr	Normal	Normal	[1]
Missense	c.389C>T	p.Thr130 (98) Ile	Low	Low	[2]
Missense	c.464T>G	p.Phe155 (123) Cys	Low	Low	[2]
Missense	c.737T >A	p.Val246 (214) Glu	Low	Low	[2]
Missense	c.817A>G	p.Lys273 (241) Glu	Low	Normal	[2]
Missense	c.1114C>T	p.Leu372 (340) Phe	Low	Low	[2]
Missense	c.1202A>G	p.His401 (369) Arg	Low	Low	[2]
Missense	c.1274G>A	p.Arg425 (393) His	Low	Normal	[2]
Nonsense	c.6T>G	p.Tyr2 (-31) *	Low	Low	[2]
Nonsense	c.203C>G	p.Ser68 (36) *	Low	Low	[2]
Nonsense	c.304A>T	p.Lys102 (70) *	Low	Low	[2]
Nonsense	c.1016G>A	p.Try339 (307) *	Low	Low	[2]
Nonsense	c.1171C>T	p.Arg391 (359) *	Low	Low	[2]
Nonsense	c.1185T>A	p.Tyr395 (363) *	Low	Low	[2]
Nonsense	c.337_338delCT	p.Pro112 (80) fs*14	Low	Low	[2]
Deletion	c.460_462delTTC	p.Phe154 (122) del	Low	Low	[2]
Missense	g.7920C>T	p.Trp225Cys	Low	Low	[3]
Missense	g.13863C>A	p.Ala404Asp	Low	Low	[3; 4]
Compound	c.134G>A & c.342T>G	p.Arg45Gln & p.Ser114Arg	Low	Low	[4; 5; 6]

Deletion	c.337-338del	p.Leu113fs	Low	Unknown	[7]
Nonsense	c.770G>A	p.Trp257*	Low	Low	[4; 7]
Deletion	c.800-803del	p.Arg267fs	Low	Normal	[4; 7]
Missense	g.1267G >A (p.A391T)	p.Ala391Thr	Normal	Normal	[8]
Missense	g. 8263 C>T	Leu340Phe	Low	Low	[9]
Deletion	g. 5894- 6 del TTC	Phe122del	Low	Low	[8]
Missense	g. 5898 T>G	Phe123Cys	Low	Low	[8]
Nonsense	g:3239-3240delCT	Pro80Profs14*	Low	Low	[10]
Nonsense	g:3206A>T	p.Lys70*	Low	Low	[9]
Missense	g:13328G>A	p.Ala404Thr	Low	Low	[11]
Missense	g:2757C>T	p.Thr98Ile	Low	Low	[7; 12]
Nonsense	g:13389delG	p.Arg425Glufs*1	Low	Low	[13]
Nonsense	g:10381delT	p.Phe400Serfs*5	Low	Low	[14]
Missense	g:13830G>A	p.Arg393His	Low	Normal	[15]
Nonsense	g:610G>T	p.Tyr31*	Low	Low	[16]
Nonsense	g:18390-1insCT	p.Thr401*	Low	Normal	[17]
Nonsense	g:10446C>T	p.Arg142*	Low	Low	[17]
Missense	g:7747T>C	p.Leu78Pro	Low	Normal	[17]
Missense	g:7386G>C	p.Trp255Cys	Low	Low	[18]
Nonsense	g:2591C>T	p.Ser36*	Low	Low	[18]
Nonsense	g:9819C>T	p.Arg359*	Low	Low	[18]
Nonsense	g:9833T>A	p.Tyr363*	Low	Low	[19]
Deletion	c.1061_1078del	p.Phe355_Gly360del	Low	Low	[20]
Nonsense	c.1033_1035 del	p.Glu345del	Low	Low	[21]
Missense	c.442T>C	p.Ser148Pro	Low	Low	[21]
Missense	c.235C>T	p.Arg79Cys	Low	Low	[21]

AT:A: antithrombin activity; AT:Ag: antithrombin antigen

Table S3 Summary for mutations of *PROC* gene reported in Chinese

Type	Nucleotide change	Amino acid change	PC:A level	PC:Ag level	Ref.
Missense	g:6219G>A	p.Arg169Gln	Low	Low	[22; 23]
Missense	g:6128T>G	p.Phe139Val	Low	Low	[24]
Missense	g:8478G>C	p.Asp255His	Low	Low	[24]
Compound	g.26T>C & g.8599C>T	p.Leu8(−34)Pro & p.Thr337 (295)Ile	Low	Low	[25]
Compound	g.1474G>A & g.6152C>T	p.Glu71(29)Lys & p.Arg189 (147)Trp	Low	Low	[25]
Compound	g.6245C>T & g.8478G>C	p.Arg220 (178)Trp & p.Asp297 (255)His	Low	Low	[25]
Compound	g.5498C>T & g.6152C>T	p.Arg57 (15) Trp & p.Arg189 (147)Trp	Low	Low	[25]
Compound	g.26T>C & g.7212 C>T & g.6161-6163delAAG	p.Leu8 (−34)Pro & p.Ala251 (209)Val & p.Lys192 (150)del	Low	Low	[25]
Compound	g.6152C>T c.1680T>Ac	p.Arg189 (147)Trp & p.Tyr560X	Low	Low	[25]
Compound	g.6152C>T g.6245C>T	p.Arg189 (147)Trp & p.Arg220(178)Trp	Low	Low	[25]
Missense	g.5498 C>T	p.Arg57(15)Trp	Low	Low	[25]
Missense	g.3426G>T	p.Asp170(128)Tyr	Low	Normal	[25]
Missense	g.3442G>A	p.Cys175(133)Tyr	Low	Low	[25]
Missense	g.6152C>T	p.Arg189(147)Trp	Low	Low	[25]
Deletion	g.6161-6163delAAG	p.Lys192(150)del	Low	Low	[25]
Missense	g.8478G>C	p.Asp297(255)His	Low	Unknown	[25]
Missense	g.8746T>C	p.Leu386(344)Pro	Low	Normal	[25]
Missense	g.8763G>A	p.Gly392(350)Arg	Low	Normal	[25]
Missense	g.8807G>A	p.Met406(364)Ile	Low	Normal	[25]
Nonsense	g.8831G>A	p.Trp414(372)X	Low	Low	[25; 26]
Missense	Unknown	p:Thr315Asn	Low	Low	[27]
Missense	g:5498C>T	p.Arg15Trp	Low	Low	[25; 28]
Missense	c.889G>C	p.Asp297His	Low	Normal	[29]
Missense	c.1258G>T	p.Val420Leu	Low	Normal	[29]
Compound	c.889G>C & c.1258G>T	p.Asp297His & p.Val420Leu	Low	Normal	[29]
Missense	g:6128T>G	p.Phe139Val	Low	Low	[30]
Missense	g:8478G>C	p.Asp255His	Low	Low	[30]
Compound	g:6128T>G & g:8478G>C	p.Phe139Val & Asp255His	Low	Low	[30]
Missense	c.842A>T	p.Asp281Val	Low	Unknown	[31]
Compound	c.541T>G & c.565C>T	p.Phe181Val & p.Arg189Trp	Low	Unknown	[31]
Splicing	c.400+1G>C	-	Low	Unknown	[31]
Deletion	c.574_576del	p.Lys192del or p.Lys193del	Low	Normal	[31]
Compound	g:5540G>A & g:10230C>T	p.Glu29Lys & p.Arg147Trp	Low	Low	[32]
Missense	g:5540G>A	p.Glu29Lys	Low	Low	[32]

Missense	g:10230C>T	p.Arg147Trp	Low	Low	[32; 33]
Missense	g:3135 c>G	p.Cys64Trp (PC Shanghai)	Low	Low	[34]
Missense	g:6128T>G	p.Phe139Val	Low	Low	[34; 35]
Compound	g:3135 c>G & g:6128T>G	p.Cys64Trp & p.Phe139Val	Low	Low	[34]
Deletion	g:1616-1613del	p.Lys150del	Normal	Normal	[34]
Deletion	g:6164-6166del	p.Lys151del	Normal	Normal	[34]
Missense	c.508G>T	p.Asp170Tyr	Low	Unknown	[4; 36]
Deletion	c.577-579del	p.Lys192del	Low	Unknown	[4; 36]
Missense	c.1174G>A	p.Gly392Arg	Low	Unknown	[4; 36]
Missense	c.1157T>C	p.Leu386Pro	Low	Unknown	[4; 36]
Missense	c.524G>A	p.Cys175Tyr	Low	Unknown	[4; 36]
Missense	c.856G>A	p.Gly266Arg	Low	Unknown	[4]
Compound	c.541T>G & c.595C>T	p.Phe181Val & p. Arg199*	Low	Unknown	[4]
Nonsense	c.740G>A	p.Trp247*	Low	Unknown	[4; 37]
Missense	c.1218G>A	p.Met406Ile	Low	Unknown	[4; 25]
Missense	c.752C>T	p.Ala251Val	Low	Unknown	[4]
Missense	c.565C>T	p.Arg189Trp	Low	Unknown	[4; 36; 38]
Missense	c.949C > T	p.Pro275Ser	Low	Low	[39]
Compound	6245C>T & 8478G>C	p.Arg178Trp & p. Asp255His	Low	Low	[40]
Compound	26T>C & 8599C>T	p.Leu34Pro & p.Thr295Ile	Low	Low	[40]
Compound	c.889G. & c.1258G>T	p.Asp297His & p.Val420Leu	Low	Low	[38]
Splicing	c.*73C>T	-	Low	Low	[38]
Missense	c.524G>A	p.Cys175Tyr	Low	Low	[38]
Nonsense	c.716dupG	p.Ala240GlyfsX17	Low	Low	[38]
Missense	c.632G>A	p.Arg211Gln	Low	Low	[38]
Compound	c.349_352del & c.541T.G	p.Phe118AlafsX16& p.Phe181Va	Low	Low	[38]
Splicing	c.400+5G>A	-	Low	Low	[38]
Missense	c.316T>G	p.Cys106Gly	Low	Low	[38]
Missense	c.889G>C & c.891C>T	p.Asp297His	Low	Low	[38]
Missense	c.935C>T	p.Ser312Leu	Low	Low	[38]
Missense	c.658C>T	p.Arg220Trp	Low	Low	[38]
Compound	c.541T>G & c.980A>T	p.Phe181Val p.Glu327Val	Low	Low	[38]
Missense	c.208A>G	p.Lys70Glu	Low	Low	[38]
Splicing	c.237+5G>A	-	Low	Low	[38]
Missense	c.669C>A	p.Ser223Arg	Low	Low	[38]
Missense	c.541T>G	p.Phe181Val	Low	Low	[38]
Missense	g:1265C>T	p:Pro275Ser	Low	Low	[41]
Compound	c.595C>T & c.541 T>G	p.Phe181Val & p.Arg199*	Low	Low	[37]
Compound	nt26T>C & nt7212C>T & nt6166-6163delAAG	p:Leu34Pro & p. Ala209Val & p.Lys150del	Low	Low	[42]
Missense	c.1069A>G	p.Thr357Ala	Low	Low	[21]
Missense	c.970G>A	p.Gly324Ser	Low	Low	[21]
Missense	c.541T>G	p.Phe181Val	Low	Low	[21]
Missense	c.658C>T	p.Arg220Trp	Low	Low	[21]

Deletion	c.577_579del	p.Lys193del	Low	Low	[21]
Missense	c.1019C>T	p.Thr340Met	Low	Low	[21]
Missense	c.247T>C	p.Trp83Arg	Low	Low	[21]
Missense	c.487G>A	p.Ala163Thr	Low	Low	[21]
Missense	c.865C>T	p.Pro289Ser	Low	Low	[21]
Missense	c.262G>A	p.Asp88Asn	Low	Low	[21]

PC:A: protein C activity; PC:Ag: protein C antigen

References

1. Zeng W, Tang L, Jian XR, Li YQ, Guo T, Wang QY, Liu H, Wu YY, Cheng ZP, Hu B, Lu X, Yu JM, Deng J, Wang HF, Sun CY, Yang Y, Hu Y. Genetic analysis should be included in clinical practice when screening for antithrombin deficiency. Thromb Haemost 2015; 113(2): 262-271
2. Ding Q, Wang M, Xu G, Ye X, Xi X, Yu T, Wang X, Wang H. Molecular basis and thrombotic manifestations of antithrombin deficiency in 15 unrelated Chinese patients. Thromb Res 2013; 132(3): 367-373
3. Xia Y, Lu QY, Lu YL, Dai J, Ding QL, Wang XF, Xi XD, Wang HL. Molecular basis of type I antithrombin deficiency in two women with recurrent venous thromboembolism in the first trimester of pregnancy. Blood Cells Mol Dis 2012; 48(4): 254-259
4. Gu Y, Shen W, Zhang L, Zhang J, Ying C. Deficiency of antithrombin and protein C gene in 202 Chinese venous thromboembolism patients. Int J Lab Hematol 2014; 36(2): 151-155
5. Deng H, Shen W, Gu Y, Ma X, Zhang J, Zhang L. Three case reports of inherited antithrombin deficiency in China: double novel missense mutations, a nonsense mutation and a frameshift mutation. J Thromb Thrombolysis 2012; 34(2): 244-250
6. Deng H, Chen J, Xie H, Gu Y, Yuan K, Wang P, Shen W, Liang W, Zhang H, Zhang J, Xie J, Zhang L. Rare double heterozygous mutations in antithrombin underlie hereditary thrombophilia in a Chinese family. J Thromb Thrombolysis 2013; 36(3): 300-306
7. Xia Y, Ding QL, Xu GQ, Zhang LW, Dai J, Lu YL, Wang XF, Xi XD, Wang HL. Molecular mechanisms of recurrent venous thrombosis in two pedigrees with type I antithrombin deficiency. Zhonghua Xue Ye Xue Za Zhi 2011; 32(12): 848-853
8. Zheng H, Ma HP, Xu WF, Zhang YQ, Wu JJ, Wang J. Identification of a new *SERPINC1* mutation in a Kazak family that alters the heparin binding capacity of antithrombin. Thromb Res 2014; 134(6): 1344-1349
9. OUYANG Q, Ding Q, Xu G, Zhang L, Dai j, Lu Y, Wang X, Xi X, Wang H. Study on the relationship between phenotypes and genotypes in three Chinese pedigrees with inherited antithrombin deficiency. Chin J Blood Transfusion 2011; 24(5): 362-366
10. Chen Q, Lu YL, Xu GQ, Ding QL, Wang XF, Xi XD, Wang HL. Two new mutations of AT gene in type I inherited antithrombin deficiency. Zhonghua Xue Ye Xue Za Zhi 2010; 31(3): 145-148
11. Zhou RF, Shi GC, Fu QH, Wang WB, Xie S, Dai J, Ding QL, Hu YQ, Wang XF, Deng WW, Wang HL. [A heterozygous point mutation G13328A in antithrombin gene causes thrombosis]. Zhonghua Xue Ye Xue Za Zhi 2005; 26(11): 661-664
12. Zhou RF, Dai Q, Fu QH, Wang WB, Xue S, Ding QL, Hu YQ, Wang XF, Wang HL. Type I hereditary antithrombin deficiency due to C2757T heterozygotic mutation in antithrombin gene. Zhonghua Yi Xue Za Zhi 2005; 85(23): 1640-1642
13. Fu Q, Xu X, Ding Q, Hu Y, Wang X, Wang H. Type I antithrombin deficiency due to 13389G

deletion in antithrombin gene. Zhonghua Xue Ye Xue Za Zhi 2002; 23(11): 588-590
14. Li Z, Gong C, Lv J, Fang P, Wang G, Lun Y, Bai J. Type I antithrombin deficiency due to 10381T deletion in antithrombin gene. Basic＆Clinical Medicine 2014; 34(3): 397-401
15. Ye X, Feng Y, Jin PP, Zhou XH, Ding QL, Wang XF. [Antithrombin deficiency due to heterozygous antithrombin gene mutation and a pedigree study]. Zhonghua Xue Ye Xue Za Zhi 2007; 28(9): 587-589
16. Cao YN, Xia Y, Wang XF. The correlation of thrombosis occurring and experimental phenotypic and genotypic in six inherited thrombophilia cases. Zhonghua Xue Ye Xue Za Zhi 2013; 34(3): 256-258
17. Sun L, Yu ZQ, Wang CR. Molecular mechanisms of antithrombin gene mutations in 3 pedigrees with hereditary antithrombin deficiency. Zhonghua Xue Ye Xue Za Zhi 2013; 34(3): 253-255
18. Wu Y, Xu G, Zhang L, Dai Q, Ding Q, Xi X, Wang X, Wang H. Molecular analysis of the genotypes and phenotypes in three pedigrees with inherited antithrombin defidency. zhong hua jian yan yi xue za za zhi 2009; 32(11): 1257-1261
19. Zhang FH, Ding QL, Wu JS, Zhou RF, Wang XF, Xu XC. A novel mutation in antithrombin gene results in hereditary antithrombin deficiency. Zhonghua Xue Ye Xue Za Zhi 2006; 27(9): 598-601
20. Jian X. Type I antithrombin deficiency caused by a large deletion of 18bp: functional and pathological relevance. Master' theme of Huazhong University of Science and Technology 2014;
21. Zhu T, Ding Q, Bai X, Wang X, Kaguelidou F, Alberti C, Wei X, Hua B, Yang R, Wang X, Wang Z, Ruan C, Schlegel N, Zhao Y. Normal ranges and genetic variants of antithrombin, protein C and protein S in the general Chinese population. Results of the Chinese Hemostasis Investigation on Natural Anticoagulants Study I Group. Haematologica 2011; 96(7): 1033-1040
22. Liu L, Guo WR, He LS, Mu H, Jiang Y, Huang FQ, Li JZ. A point mutation of protein C gene in a congenital protein C deficiency pedigree. Zhonghua Xue Ye Xue Za Zhi 2003; 24(3): 115-118
23. Liu L, Guo W, He L, Mu H, Jiang Y, Huang F, Li J. A point mutation of protein C gene in a congental protein C deficiency pedigree. Chin j Hematol 2003; 24(3): 115-118
24. Yang LH, Zheng FX, Chen Y, Jin YH, Zhang Z, Xie HX, Yang XL, Wang MS, Chen BC. The significance of F139V mutation on thrombotic events in compound heterozygous and homozygous protein C deficiency. Blood Coagul Fibrinolysis 2014; 25(8): 824-830
25. Ding Q, Shen W, Ye X, Wu Y, Wang X, Wang H. Clinical and genetic features of protein C deficiency in 23 unrelated Chinese patients. Blood Cells Mol Dis 2013; 50(1): 53-58
26. Jin P, Huang B, Dai j, Zhang H, Yu Y, Wang X, Ding Q, Wang H. Gene analysis of hereditary protein C and protein S deficiency in two Chinese pedigrees. J Diagm Concepts Pract 2006; 2006(5): 507-510
27. Ding Q, Yang L, Dinarvand P, Wang X, Rezaie AR. Protein C Thr315Ala variant results in gain of function but manifests as type II deficiency in diagnostic assays. Blood 2015; 125(15): 2428-2434
28. Zhou RF, Fu QH, Wang WB, Xie S, Hu YQ, Wang XF, Wang ZY, Wang HL. Biochemical activity and gene analysis of inherited protein C and antithrombin deficiency in two Chinese pedigrees. Chin Med J (Engl) 2004; 117(6): 813-817
29. Liu H, Wang HF, Tang L, Yang Y, Wang QY, Zeng W, Wu YY, Cheng ZP, Hu B, Guo T, Hu Y. Compound heterozygous protein C deficiency in a family with venous thrombosis: Identification and in vitro study of p.Asp297His and p.Val420Leu mutations. Gene 2015; 563(1): 35-40
30. Yang LH, Wang MS, Zheng FX, Li J, Chen Y, Jin YH, Xie HX, Yang XL, Chen BC. Different impact of two mutations of a novel compound heterozygous protein C deficiency with late onset thrombosis. Genet Mol Res 2014; 13(2): 2969-2977
31. Tang L, Lu X, Yu JM, Wang QY, Yang R, Guo T, Mei H, Hu Y. *PROC* c.574_576del polymorphism: a

common genetic risk factor for venous thrombosis in the Chinese population. J Thromb Haemost 2012; 10(10): 2019-2026

32. Ye X, Liu X, Feng Y, Ding Q, Zhou X, Wang X. [A pedigree analysis of pulmonary embolism caused by compound heterozygous mutations of protein C]. Nan Fang Yi Ke Da Xue Xue Bao 2012; 32(1): 109-112

33. Tsay W, Shen MC. R147W mutation of PROC gene is common in venous thrombotic patients in Taiwanese Chinese. Am J Hematol 2004; 76(1): 8-13

34. Zhou RF, Cai XH, Xie S, Wang XF, Wang HL. Molecular mechanism for hereditary protein C deficiency in two Chinese families with thrombosis. J Thromb Haemost 2006; 4(5): 1154-1156

35. Yang LH, Zhu LQ, Wang YY, Xie HX, Xie YS, Jin YH, Wang MS, Chen BC, Yang XL. Analysis of a hereditary protein C deficient consanguineous pedigree caused by Phe139Val homozygous mutation. Zhonghua Xue Ye Xue Za Zhi 2013; 34(9): 767-770

36. Shen W, Gu Y, Zhang L, Zhang JW, Ying CM, Fu QH. A survey of 20 inherited protein C deficiencies in the patients with venous thromboembolism. Zhonghua Yi Xue Za Zhi 2012; 92(23): 1603-1606

37. Luan CJ, Shen W, Yu Z, Chen L, Gu Y, Tang LY, Wang ZG, Dai L, Gu MM. Two nonsense mutations cause protein C deficiency by nonsense-mediated mRNA decay. Thromb Res 2015; 135(4): 733-738

38. Tang L, Guo T, Yang R, Mei H, Wang H, Lu X, Yu J, Wang Q, Hu Y. Genetic background analysis of protein C deficiency demonstrates a recurrent mutation associated with venous thrombosis in Chinese population. PLoS One 2012; 7(4): e35773

39. Yu T, Dai J, Liu H, Wang J, Ding Q, Wang H, Wang X, Fu Q. Homozygous protein C deficiency with late onset venous thrombosis: identification and in vitro expression study of a novel Pro275Ser mutation. Pathology 2012; 44(4): 348-353

40. Wu YT, Yue F, Wang M, Lu YL, Dai J, Ding QL, Wang HL, Chen HF, Wang XF. Hereditary protein C deficiency caused by compound heterozygous mutants in two independent Chinese families. Pathology 2014; 46(7): 630-635

41. Wang J, Dai J, Fu Q, Wang X, Wang CR, Wang h. Pro 275 Ser Homozygous Mutation of *PROC* Gene Causes Type II Inherited Protein C Deficiency. Chinese Journal of Thrombosis and Hemostasis 2009; 15(4): 149-153

42. Wu Y, Ding Q, Dai J, Lu Y, Xi X, Wang X, Wang H. Study of molecular mechanisms of hereditary protein C deficiency in four Chinese families. Chin J Lab Med 2010; 33(7): 599-605