

Supplemental table: Complete list of genes causal for, susceptible of or associated with risk of CAD/MI Identified in Linkage and/or Association Studies by either candidate-gene or genome-wide approaches

Chromosome	Gene/locus	polymorphism	Observed effects	Mechanisms	Reference
1p13	SORT1-PSRC1-CELSR2	rs599839 A>G rs646776 T>C	↓ risk of CAD with CG Haplotype, C and G allele associate with low LDL ↑ risk of CAD with AT Haplotype	Lipid metabolism – non-HDL levels, PSRC1 expression associated with CAD, over expression of SORT1 increases LDL-particle intake.	[1, 2]
1p32.2	PPAR2B	rs17114036 >A	↑ risk of CAD/MI	unknown	[3, 4]
1p32.3	PCSK9	rs11206510 >T	↑ CAD	Lipid metabolism	[5]
1p34	LRP 8	R952Q	↑ early onset CAD and MI	Increased p38 MAPK activity to oxidize LDL, increased platelet activation Increased triglyceride [Shen et al 2012]	[6]
		TCCGC allele	↓CAD, Protective against CAD,	Possible reduction of p38 MAPK activity, platelet activation and thrombosis, atherosclerosis	[7]
		TACGC allele	↑ risk of early onset CAD and MI	Increased LDL, increase p38MAPK	[8]
1p35.1	CX37	C1019T	↑ CAD in C allele carriers in Chinese	Vascular homeostasis	[9]
1p36.3	MTHFR	C677T	↑ CAD in UK Indian Asians, Koreans, Chinese	Homocysteine metabolism – Increase plasma level of homocysteine	[10-15]
1q21.3	IL-6R	rs4845625	↑ CAD	Inflammation	[16]
1q22-q25	SELE (E-selectin)	G2692A C1901T	↓ risk of MI in Polish population	Inflammation – leukocyte adhesion, leukocyte/endothelium interaction	[17]
		A561C G98T	↑ risk of CAD/MI in meta-analysis		[18]
1q23	Factor V	G1691A	↑ risk of MI	Thrombosis - Increase thrombotic tendency High clotting tendency	[19, 20] [21]
1q23.3	USF1	rs3737787>C	↑ risk of CAD in female	Lipid metabolism – familial combined hyperlipidemia	[22]
1q31	IL-10	G(-1082)A	GG ↓ risk of MI in Italians AA ↑ risk of MI in Italians	Inflammation	[23]
1q31	Factor XIII	Val34Liu	↓ risk of MI in Finnish	Thrombosis – decreased coagulation	[24, 25]
1q31.1	FAM5C (BRINP3)	rs1891586	↑ risk of early onset CAD	Unknown	[26]
1q31	GLUL (Glutamate-ammonia ligase)	rs10911021 T>C	C/C allele associated with CAD in diabetic pts, T/T allele protective	Risk allele C/C associated with decreased glutamate-ammonia ligase expression in endothelial cells.	[27]
1q41	MIA3 (melanoma inhibitor protein 3)	rs17465637 C>A	↑ CAD/MI risk in rheumatoid arthritis individuals	Inflammation – leukocyte adhesive interaction with endothelium	[28, 29]
1q42.2	AGT (Angiotensinogen)	Met235Thr	↑ CAD/MI in Canarian/Spanish	Independent of hypertension, mechanism unknown	[30, 31]
1q43	MTR	A2756G	G/G ↑ CAD/MI in Europeans	Homocysteine metabolism	[32]
2p11.2	VAMP5-VAMP8-GGCX	rs1561198	↑ CAD	unknown	[16]
2p13	ALMS1	Glu repeat variants	↑ early onset MI in East Asians	unknown	[33]
2p13.2	CCT7	C>T Subst. Exon 10 p.Ser525Leu	Early onset MI in affected member of extend MI families	De-stablizing α1 subunit of soluble guanylyl cyclase protein and reducing activity, ↓ NO-induced cGMP, ↑ thrombosis	[34]
2p21	ABCG5/8	rs41360247	↓ risk of CAD/MI	Lipid metabolism – decreased phytosterol	[35]
2p24.1	ApoB	Rs515135	↑ risk of CAD/MI	Lipid metabolism	[16]

2q14	IL-1	CCC haplotype of IL1 cluster	↑ risk of CAD/MI	Inflammation	[36]
2q14	IL-1 α	C549T	↑ risk of CAD/MI	Inflammation	[36]
2q22.3	ZEB2	rs2252641 >G	↑ CAD	unknown	[16]
2p24.1	TTC32-WDR35	rs2123536 >T	↑ CAD/MI in Chinese Han	unknown	[37]
2q24.3	DPP-IV	rs3788979	↑ MI with angiographic CAD	Inflammation and neovascularization, plaque vulnerability	[38]
2q33.1	Hsp60	GCTC haplotype	↑ CHD in Chinese Han	Chaperone for cell protection from oxidative injury	[39]
2q33.2	WDR12	rs6725887 >C	↑ CAD	unknown	[4]
3p21.1	BBAP1	rs11066001	↑ MI in Asian	Inflammation?	[40, 41]
3p21.1	ITIH3	Intron 11 24C>T	↑ MI	Inflammation - VSMC and Macrophage expressing	[42]
3p21.3	SEMA3F	rs12632110 C>T	↑ CAD/M in Japanese	unknown	[43]
3p24.3	PLCL2	rs62248161 A>G	GWAS association with MI	Inflammation- B cell proliferation/function	[44]
3p25	PPAR γ 2	Pro12Ala homo	↓MI risk in Italian, Tunisian, Chinese	Lipid metabolism – TG level reduction	[45, 46]
3p25	PPAR γ	C161T	↓ risk of CAD/MI in Chinese	Lipid metabolism – TG level reduction; inflammation – decreased expression of MMP9 and TNF α [Liu Y et al2007]	[47]
3q13.2-q21	LSAMP	rs4404477G>A	A allele associated with left main CAD	SMC and macrophage proliferation – tumor suppressor gene LoF variants	[48]
3q21.2	Kalirin	rs9289231	↑ risk of early onset CAD/MI in White	Endothelial dysfunction –iNOS activity, Rho GTPase-signaling pathway	[49]
3q21.3	GATA2	rs1573949 T>C	↑ CAD/MI	Inflammation and lipid metabolism – transcriptional control	[50]
3q22.3	MRAS	rs2306374 >C	↑ CAD/MI	unknown	[3, 51]
3q24	AT1R	A1166C	↑ CAD/MI	Blood pressure regulation and vascular homeostasis	[52, 53]
		AGTR1, 3 SNPs			
3q27	Adiponectin	T(+45)G	Associated with CAD in French and Swiss	Insulin resistance and DM2	[54]
		+276 T/T	↓CAD risk in high risk patients, Protective against CAD	Unknown	[55] [56, 57]
4p12	Atp10d	rs2351791 T>G	↑ risk of CAD in Japanese	Lipid metabolism – low HDL	[58]
4q31.1	GUCY1A3	rs7692387 G>A	↑ risk of CAD and hypertension	Unknown – Hypertension	[16, 37]
		T INS in Exon 6 p. Leu163Phefs*24	↑ Early onset MI in affected member of extend MI families	De-stablizing α 1 subunit of soluble guanylyl cyclase protein and reducing activity, ↓ NO-induced cGMP, ↑thrombosis	[34]
4q31.22	EDNRA	rs1878406 T>C	↑ risk of CAD	unknown	[16, 59]
4q32.3	Palladin/KIAA0992	rs12510359 G>A	↑ MI	Unknown – cytoskeletal protein	[60, 61]
5p13.3	IRX, ADAMTS16	rs11748327 >C	↑ CAD/MI in Japanese	unknown	[62]
5p15.31	MTRR	A66G	GG ↑ CAD/MI in	Homocysteine metabolism	[63]
5p15.33	SLC6A18 (solute Carrier Family 6, member 18)	rs7447815 G>C	CC + CG alleles associated with ↑ risk of MI in Japanese	unknown	[64]
5q31.1	IL-9	C4244T	↑ CAD/MI	inflammation	[36]
5q31.1	IL-5	rs2706399 >A	↑ CAD/MI	inflammation	[65]
5q31.1	CD14	C260T	↑ MI in Japanese women	CD14 is LPS receptor, regulates inflammation	[66]
5q31.1	SLC22A4-A5	rs273909 C>T	↑ CAD/MI	unknown	[3]
6p12	VEGFA	C(-2578)A T(-460)C	↑ CAD/MI, combination with smoking, exaggerate risk	Endothelial dysfunction - hoemostasis	[67]
6p12.3	PLA2G7	R92H	↓CAD/MI in Chinese Han	Oxidative stress - oxidation of phospholipids via Lp-PLA(2) activity; thrombosis - platelet activity	[68]

		G994->T missense	↑ CAD/MI in Japanese men	Oxidative stress and thrombosis - Decrease Lp-PLA(2) activity; regulating platelet activity	[69, 70]
		rs13210554 C>T	↑ MI in Chinese Han	Oxidative stress and thrombosis - Decrease Lp-PLA(2) activity; regulating platelet activity	[71]
6p21.2	KCNK5	rs10947789 >T	↑ CAD/MI	unknown	[16]
6p21.3	Lymphotoxin-α	p. Thr26Asn)	↑ CAD/MI	inflammation	[72, 73]
6p21.3	TNF-α	G(-308)A	↑ MI and obesity in Taiwan	Inflammation, EC dysfunction, insulin resistance, lipid metabolism	[74]
6p21.33	HLA-C, B, HCG-27	rs3969109 >G	↑ CAD/MI	unknown	[75]
6p22.1	BTN2A1	rS6929846 >T	↑ MI in Eastern Asians	Lipid metabolism	[76]
6p24.1	PHACTR1	rs12526453 >C	↑ CAD	Unknown	[5]
6p24.1	C6orf105	rs6903956 >A	↑ CAD in Chinese	Unknown	[77]
6q21.31	ANKS1A	rs17609940 >G	↑ CAD	unknown	[3]
6q22.1	ROS1	rs529038 A>G p. Asn2213Asp	↑ MI	Unknown - Tyrosine kinase function related	[60]
		rs619203 G>C p. Cys2229Ser	↑ MI	Unknown- Tyrosine kinase function related	[60]
6q23	TCF21	rs12190287 G>C	↑ risk of MI	unknown	[78] [3]
6q25.3	LPA	rs3798220 >C	↑ CAD/MI	Lipid metabolism – Lp(a) level	[79]
6q26	Plasminogen	rs4252120 >T	↑ CAD/MI	Thrombosis – tPA activity and plasmin production	[16]
7p21	IL-6	G(-174)C	↑ CAD/MI in Greece	inflammation	[80] [81]
7p21	C5	p. Ala2416Gly	↑ CAD/MI	inflammation	[36]
7p21.1	HDAC9	rs2023938 >G	↑ CAD/MI	Unknown	[16]
7q21.3	PON1	T(-107)C p. Leu55Met	↑ CAD/MI	Homocysteine - elevated	[82]
7q21.3	PON1/2	p. Gln192Arg	↓CAD/MI risk	Antioxidant enzyme, degrade oxidized LDL	[83, 84]
7q22.1	PAI-1	4G/5G with 4G carrier G(-844)A	↑ MI in Parkistani population, ↑ MI	Hypercoagulation - Thrombosis Hypercoagulation, thrombosis – reduced tPA	[85] [86]
7q22.3	BCAP29	rs10953541 >C	↑ CAD	Unknown	[87]
7q32.3	KLF14	rs4731702 C>T rs111400 A>G p.Ser58pro	↓MI risk in Chinese ↑ MI risk in Chiense	Lipid metabolism – altered HDL, LDL levels	[88] [88]
7q32.21	ZC3HC	rs11556924	↑ CAD	Unknown	[3]
7q36	INSIG1 (insulin induced gene 1)	Hap3 (TGA) Hap4 (TTA)	↓CAD/MI in Chinese Han ↑ CAD/MI in Chinese Han	Regulating glucose and lipid metabolism Regulating glucose and lipid metabolism	[89] [90]
7q36	eNOS	A498G T(-786)C G894T (p. Glu298Arg) C1367R	↑ CAD/MI	Endothelial dysfunction, inflammation	[36, 91-93]
8p12	WRN	rs264 >G	↑ CAD	Unknown	[94,95]
8p21.3	LPL	p. Ser447Ter rs1080846 >A	↑ CAD ↑ CAD	Lipid metabolism – primary TG and HDL levels Lipid metabolism – primary TG and HDL levels	[16] [96]
8q24.13	TRIB1	G41T (p. C14F); T202C (p. C68R) double homo	↑ early CAD	Lipid metabolism – low HDL, high LDL	[97]

8q24.3	GPIHBP1	rs4977574 G>G	↑ CAD/MI and many other vascular diseases	Lipid metabolism – extremely high TG	[98]
9p21	CDKN2B-AS1	rs1333049 C>G	↑ CAD/MI and familial, hypercholesterolemia	unknown	[99, 100][1]
9p21.3	ANRIL	rs2230806 >A	↑ CAD	Non-coding ANRIL, possible lipid metabolism	[101]
9q31.1	ABCA1	Many mutations	Tangier disease	Lipid metabolism – LoF causes primary elevated TG and decreased HDL	[102]
		G1051A, p.R219K, KK allele	↓ CAD/MI	Lipid metabolism	[103]
		rs579459 T>C	↑ Worse ACS outcome in prospective study	Lipid metabolism	[104]
9q33	DAB2IP	Rs7025486>A	↑ CAD/MI	unknown	[105, 106]
9q34.2	ABO	rs3739998 C p. S1002T	↑ risk of CAD/MI	unknown	[107]
10p11.23	KIAA1462	rs1746048 T>C	↑ risk of MI in Chinese	unknown	[108]
10q11.1	CXCL12	rs12762303 T>C	Promoter variant associated CAD in Europeans, not ARIC cohorts	unknown	[78]
10q11.2	ALOX5 (lipoxigenase)	Tandem repeats variants	Sp1 repeat variants are risk factor for CAD in Indian population	Inflammation – mediated by leukotrienes	[109, 110]
		rs1412444 >T	↑ risk of MI in Chinese	Lipid metabolism - Higher repeats associated with higher HDL, low LDL; Lower repeats associated low HDL, high LDL, with ↑CAD	[111]
10q23.2	LIPA (lipase A)	rs12413409 A>G	↑ MI in Chinese	unknown	[78]
10q24.32	CYP17A1-CNNM2	rs12413409 A>G	↑ AMI in Chinese	unknown	[78]
11p11	Prothrombin	G20210A	↑ AMI/CAD	Defective coagulation cascade	[112]
11p15.5	KCNQ1	G(-137)C rs187238 C>G	↑ CAD with G allele in Chinese	Lipid metabolism – LDL and DM in CAD	[113]
11q22.2	IL-18	rs974819 >T	↑ CAD/MI	Inflammation	[114]
11q22.3	PDGFD	T(-1131)C rs662799	↑ risk of MI in Italians	unknown	[87]
11q23.3	ApoA5	rs964184 >G	↑ CAD/MI	Lipid metabolism – elevated TG (independent of TG)	[115, 116]
11q23.3	ZNF259-APOA5-APOA1	Promoter 5A/6A	↑ CAD/MI, may also ↑ restenosis	Lipid metabolism	[3]
11q22.3	MMP-3	C825T; 6A allele	↑ MI and obesity in Taiwan	Matrix regulation	[117]
12p13	GNB3	rs1376251 C>T (Cys203Tyr)	↑ MI	Increased G protein mediated signaling	[74]
12p13.2	TAS2R50	rs7136259 >T	↑ CAD/MI in Chinese	Unknown - G protein coupled receptors	[60]
12q21.33	ATP2B1	rs3782889 >C	↑ CADMI in Chinese	Hypertension	[37]
12q24.11	MYL2	rs11066015 >A	↑ CAD/MI	Unknown	[37]
12q24.12	ACAD10, ALDH2	rs3184504 >T	↑ CAD/MI	unknown	[118]
12q24.12	SH2B3	rs11066280 >A	↑ CAD/MI in Chinese	unknown	[119, 120]
12q24.13	C12orf51	rs4758685 >T	↑ CAD/MI in Chinese	Unknown	[37]
12q24.31	MLXIP	rs3812316 >C (G771C)	↑ CAD/MI in Chinese	Glucose metabolism	[121]
		rs9319428 >A	↑ CAD/MI	Glucose metabolism	[122]
13q12.3	FLT1	rs12762303 >C	↑ CAD/MI in White/Europeans	unknown	[118]
13q12	ALOX5AP	rs4773144 >G	↑ CAD/MI in	Inflammation – leukotriene production	[109, 110]

13q34	COL4A1, COL4A2	rs1048990 C>G C(-8)G	↑ CAD/MI in Chinese, Japanese	Unknown	[4]
14q13	PSMA6	rs2895811 -C	↑ CAD/MI	Inflammation – ubiquitin-proteasome system regulation	[123, 124] [125]
14q32.2	HHIPL1	A387P N700S	↑ MI	unknown	[3]
15q15	TSP-1	C(-514)T	↑ CAD	Thrombosis, vascular homeostasis	[126]
15q21.3	LIPC	rs3825807 >7	↑ CAD/MI	Lipid metabolism	[127]
15q24.2	ADAMTS7	rs17514846 >A	↑ CAD	unknown	[128]
15q26.1	FURIN-FES	T1682C	↑ CAD/MI	Unknown	[129]
16p12.1	IL-4R	rs9925481 A>G	↑ CAD/MI in Japanese	inflammation	[36]
16p13.13	CLEC16A	rs3087456 A>G A(-168)G	↑ MI, multiple sclerosis and rheumatoid arthritis	unknown	[43, 130]
16p13	CIITA	V249I	↑ ACS if 280M is not present	Inflammation – T lymphocytes	[131]
16q13	FKN (Fractalkine), CX3CR1	T280M allele	↓ CAD risk in heterozygotes	Lost of balance, increased inflammation	[132]
		rs4329913 rs7202364	↓ risk of MI American women with elevated HDL	anti-inflammation, athero-protective	[133]
16q21	CETP			Lipid metabolism – HDL pathway	[134, 135]
16q22.1	LCAT	>80 mutations,	↑ CAD/MI	Lipid metabolism	[136]
16q24	p22phox	A640G rs12936587 >G	↑ CAD/MI	Oxidative stress	[137, 138] [139]
17p11.2	RAI1-PEMT-RASD1	(HPA-2 Thr145Met, VNTR)	↑ MI in Finnish men	unknown	[16]
17p13.2	GP Iba	ThrThr/TT haplotype	↓ risk of fatal MI in Caucasiann Finnish	Thrombosis/coagulation/fibrinolysis	[140]
		PI ^A allele	↑ risk of MI	Thrombosis/coagulation/fibrinolysis	[141]
17p13.2	GPIIb-IIIa	rs1231206 >A	↑ CAD/MI	Thrombosis/coagulation/fibrinolysis	[140]
17p13.3	SMG6, SRR	(LGALS2)	↑ risk of MI	unknown	[16]
17q11.2	Galectin-2	G361A	↑ CAD/MI	Inflammation/immunity	[142]
17q12	CCL11 (SCYA11, Eotaxin)	PIA1 vs PIA2	↑ risk of MI	Inflammation/immunity	[142]
17q21.32	GP IIIa	rs46522 >T PIA2 allele	↑ risk of MI	Thrombosis/coagulation/fibrinolysis	[140, 143]
17q21.32	UBE2Z, GIP, ATP5G1, SNF8	Deletion in intron 16 (ACE D allele)	↑ CAD/MI	Unknown	[3]
17q23.3	ACE	ACE DD allele	2 x ↑ CAD/MI in men	Vascular homeostasis	[144, 145]
		rs12373237 C>G	↑ CAD/MI in Japanese	Vascular homeostasis	
18q11.2	LAMA3	rs35792872:A>G	GWAS association with MI	unknown	[43]
19p13.3	AP3D1-DOT1L-SF3A2	rs1122608 >G	↑ CAD	Thrombosis – platelet-dense body function	[44]
19p13.2	LDL receptor	>1000 mutations	↑ CAD	Lipid metabolism	[146]
		rs2075650 >G	↑ CAD	Lipid metabolism	[4]
19q13.32	ApoE	E4/e4 variants	↑ CAD	Lipid metabolism	[16, 147]
20p11.2	Thrombomodulin	G127A, pAla25Thr	↑ MI	Thrombosis/coagulation	[148]
		rs6080699 C>G	↑ CAD/MI in Japanese	Thrombomodulin regulates thrombin activity then coagulation. Increase smoking-induced risk of CAD/MI	[149, 150]
20p11.2	PCSK2	C1117A	↑ MI in Japanese	unknown	[43]

20q13.13	PTGIS	rs9982601 >T	↑ MI	Thrombosis/coagulation/fibrinolysis	[151]
21q22.1	MRPS6, SLC5A3, KCNE2	699 C>T 1080 T>C	Homo 699T/T or 1080 C/C ↓ CAD with folate treatment	Unknown	[5]
21q22.3	CBS	rs4633 C>T rs4680 G>A	↑ CAD in Japanese elderly	Metabolic factor- homocysteine	[152]
22q11.21	COMT	A1075G G16854C	↑ mortality in European ACS ↑ CAD/MI in Chinese women	Metabolic factor- homocysteine, DM2	[153]
Xp22	ACE 2	A1075G GGC haplotype of A1075G, A8790G and G16854C;	Endothelial dysfunction	Potential anti-RAS element, LoF ACE2 may lose atheroprotective effects	[154, 155]

Note: Red, variants associated with decreased risk of CAD and MI, suggestive for potential protective genetic factors against CAD and MI.

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