

Supplementary Table 1. List of primers for RT-qPCR.

Gene Name	Direction	Primer
<i>Usp21</i>	Forward	5' -ACTGGGCCTAGACCTAATTAATCC-3'
	Reverse	5'- GGT CATGAGTAGTAAGCCCATCAC-3'
<i>Cyp4a10</i>	Forward	5'-CCAACTGAACTTTGAGATC-3'
	Reverse	5'-TGCAAATCGGGTTGGGCTTAG-3'
<i>Cyp4a31</i>	Forward	5'AAGTAGACACAGGTAGGCACTGG-3'
	Reverse	5'-TTTCTGCCTCCTGCCTAAATCC-3'
<i>Apcs</i>	Forward	5'-CAGGGGT TAGAGCTCTAGCA-3'
	Reverse	5'-GGGTGGAGAGAAGTAATACC-3'
<i>Fabp7</i>	Forward	5'-CAGCCTGCTGGAAAGAGACA-3'
	Reverse	5'-AGGAACTCGGGTCTTACCCA-3'
<i>Nlrc5</i>	Forward	5'-GGCACATAAACACACCCACC-3'
	Reverse	5'-CCAGGCCACAGGTTTCAT-3'
<i>Rbm33</i>	Forward	5'-CCAAATAAGCAGAACCTTCGAGT-3'
	Reverse	5'-TGAACTTTGCGATGGCTTTCC-3'
<i>Hmgbl</i>	Forward	5'-GGCGAGCATCCTGGCTTATC-3'
	Reverse	5'-GGCTGCTTGTCATCTGCTG-3'
<i>Dusp12</i>	Forward	5'-ACTGAAACTGTATGAGGCAATGG-3'
	Reverse	5'-CCTGTGAAATGGTAGTTGGGTC-3'
<i>Cyp7a1</i>	Forward	5'-AAACTCCCTGTCATACCACAAAG-3'
	Reverse	5'-TTTCCATCACTTGGGTCTATGC-3'
<i>Sqle</i>	Forward	5'-CCTGTAGCTCTCTTGCGTTTGA-3'
	Reverse	5'-GCTCGCTCTGGAGGAACTCTT-3'
<i>Hmgcr</i>	Forward	5'-TCGTGACGTAGGCCGTCAG-3'
	Reverse	5'-CCAATAAGGAAGGATCGTCCG-3'
<i>Srehf2</i>	Forward	5'-GACAACAAACTTGGGGGTGC-3'
	Reverse	5'-CAACCGCCGCCATGTTGAG-3'
<i>Ppara</i>	Forward	5'-GAGACCTGGAGATGGTTGA-3'
	Reverse	5'-GTGTGCTTGTGTGCATGTGA-3'

Supplementary Table 2. Mice characteristics and blood test data.

Number	Weeks	Genotype	TG (mg/dL)	FFA(μ EQ/L)	T-CHOL (mg/dL)	AST (IU/L)	ALT (IU/L)	BW (g)	Diet
1	11	HE	59	789	109	72	44	25.74	Normal diet
2	11	KO	32	823	112	62	35	22.75	Normal diet
3	11	KO	25	624	118	56	45	23.76	Normal diet
4	11	KO	22	832	87	62	29	22.64	Normal diet
5	11	WT	28	767	81	77	67	22.65	Normal diet
6	11	WT	48	758	83	56	40	26.11	Normal diet
7	11	HE	36	665	95	54	32	24.06	Normal diet
8	11	HE	41	627	101	58	40	23.67	Normal diet
9	10	HE	31	574	70	83	32	25.75	Normal diet
10	10	KO	53	762	107	46	25	24.18	Normal diet
11	10	HE	33	638	63	60	28	24.55	Normal diet
12	10	WT	50	614	82	48	26	25.36	Normal diet
13	10	KO	48	690	112	62	28	25.8	Normal diet
14	10	HE	97	728	114	40	22	24.32	Normal diet
15	10	KO	31	782	115	55	27	20.45	Normal diet
16	10	HE	21	581	88	49	12	19.46	Normal diet
17	10	WT	22	628	72	60	15	20.85	Normal diet
18	10	KO	23	795	128	40	12	21.39	Normal diet
19	10	WT	11	654	70	44	13	15.9	Normal diet
20	10	HE	29	678	83	53	14	18.32	Normal diet
21	10	HE	15	747	94	62	10	18.07	Normal diet
22	10	HE	14	943	114	53	28	19.43	Normal diet
23	10	KO	15	823	128	71	20	19.75	Normal diet
24	11	KO	32	884	125	44	28	20.64	Normal diet
25	11	KO	22	783	118	48	30	21.04	Normal diet
26	11	HE	21	637	103	47	26	20.93	Normal diet
27	11	HE	21	820	92	50	29	20.7	Normal diet
28	11	KO	33	768	122	51	28	20.19	Normal diet
29	11	HE	39	871	91	61	30	19.34	Normal diet
30	10	HE	94	851	109	47	35	26.87	Normal diet
31	10	KO	18	705	75	61	27	25.38	Normal diet
32	10	HE	27	677	116	48	36	25.98	Normal diet
33	10	HE	17	816	98	52	24	18.98	Normal diet
34	10	HE	19	867	107	50	25	19.91	Normal diet
35	10	KO	24	700	111	47	24	21.38	Normal diet
36	10	HE	17	808	61	75	31	20.42	Normal diet
37	10	WT	38	633	84	42	18	23.74	Normal diet
38	10	WT	51	536	76	41	19	23.61	Normal diet
39	10	HE	25	717	86	49	27	21.51	Normal diet
40	10	HE	27	584	91	42	21	22.75	Normal diet
41	10	HE	45	475	87	39	18	24.36	Normal diet
42	10	KO	44	606	100	54	18	22.98	Normal diet
43	10	WT	22	603	89	44	23	25.39	Normal diet
44	10	KO	48	779	116	47	24	23.42	Normal diet
45	10	HE	20	595	94	47	26	22.61	Normal diet
46	10	HE	23	610	89	38	19	21.77	Normal diet
47	10	WT	24	521	69	63	25	18.38	Normal diet
48	10	HE	18	648	81	48	20	20.72	Normal diet
49	10	KO	14	629	100	52	24	16.64	Normal diet
50	10	HE	14	582	84	45	21	18.09	Normal diet
51	10	KO	15	827	104	52	22	18.01	Normal diet
52	10	HE	54	794	79	46	19	17.14	Normal diet
53	10	WT	25	563	80	39	17	19.51	Normal diet
54	10	KO	35	773	93	55	28	20.41	Normal diet
55	10	WT	47	738	76	50	22	26.68	Normal diet
56	10	HE	20	577	65	59	20	25.66	Normal diet
57	10	KO	71	638	121	47	33	25.15	Normal diet
58	10	KO	13	722	84	74	25	22.1	Normal diet
59	10	WT	16	564	56	60	16	19.97	Normal diet
60	10	HE	11	658	69	57	22	22.35	Normal diet
61	10	WT	11	559	62	52	23	14.84	Normal diet
62	10	HE	19	817	88	48	21	17.6	Normal diet
63	10	KO	31	746	98	44	18	18.45	Normal diet
64	10	WT	35	585	84	57	29	24.65	Normal diet
65	10	WT	13	358	61	54	17	23.54	Normal diet
66	10	KO	24	631	90	49	26	18.16	Normal diet
67	10	WT	20	418	76	47	27	23.03	Normal diet
68	10	KO	20	431	122	58	32	24.29	Normal diet
69	10	HE	24	487	98	47	27	24.11	Normal diet

Supplementary Table 3. Patients' characteristics.

Sample number	Age	Gender	Height (cm)	Weight (kg)	Body fat percentage (%)	Waist circumference (cms)	BMI	LDL Cholesterol (mg/dL)
1	74	F	149	53	29.1	78	23.87279852	58
2	75	F	144.6	44.6	28	72	21.3303643	58
3	72	M	162.9	43.3	12.7	70	16.31720342	31
4	24	F	162.3	48.2	21.3	62	18.29826861	56
5	67	M	164	51	N/A	72	18.96192742	48
6	70	F	152	56	N/A	88	24.23822715	56
7	72	F	144	50	N/A	84	24.11265432	51
8	64	F	142	53	N/A	87.5	26.28446737	43
9	72	F	153	46	21.8	76	19.65056175	42
10	67	M	168	57	22.5	80	20.19557823	46
11	73	F	146	35	17.1	66	16.41959092	48
12	46	F	169	56	21.2	74.5	19.60715661	57
13	54	F	153	44	19.7	64	18.7961895	51
14	70	M	N/A	N/A	N/A	N/A	N/A	52
15	69	M	160	64	20.7	89	25	43
16	66	M	163	55	18.3	76	20.70081674	39
17	79	F	143	36	14.4	61.5	17.60477285	37
18	63	F	143	62	39.3	99	30.31933102	46
19	72	M	160	51	13.3	77.5	19.921875	47
20	60	M	159.2	52.8	N/A	75	20.83280725	53
21	56	M	168	78	N/A	102.5	27.63605442	57
22	83	F	133.4	40.6	31.1	71.9	22.81467962	52
23	64	F	151.2	54	31.7	87	23.62055933	45
24	73	F	150.6	40.6	18.8	77.5	17.90095043	54
25	77	M	162.8	70.6	22.2	93.7	26.63764949	49
26	65	F	153	49	24.8	76.8	20.93212012	49
27	49	M	165	67	18.2	84.2	24.6097337	38
28	73	M	159	69	20.5	96.5	27.29322416	47
29	68	M	165.7	53.7	14.7	75	19.55821738	49
30	74	M	162	54.2	15.6	78.6	20.65233958	49
31	79	F	146.9	51.3	25	92.3	23.77244074	53
32	78	F	144.2	48.7	20.6	93	23.42062284	40
33	55	M	163.2	49.7	11.6	73.4	18.66019079	37
34	75	M	162.9	65.5	14.4	88.4	24.68306753	55
35	59	M	163.9	67.5	25.1	86.8	25.12730236	47
36	49	F	152.3	45.1	21.3	67.3	19.44360256	56
37	63	M	167.3	60.5	12.3	74.3	21.61541075	55
38	65	M	164.1	60.3	16.1	76	22.39237456	53
39	63	F	153.5	45.7	20	73.5	19.39543125	54
40	73	F	149.3	60.3	N/A	97.6	27.05189523	57
41	76	M	162.5	65.3	29.1	91.2	24.72899408	55
42	82	F	142.7	43.4	N/A	78	21.31286251	221
43	66	F	153.8	60.5	N/A	83	25.57659365	223
44	66	F	153.9	57.4	30.5	75	24.23453286	231
45	63	F	153.6	61.7	32.3	81	26.15186903	255
46	58	F	152	56.5	29.6	73	24.45463989	217
47	64	F	152.8	60.2	33.4	84	25.78396974	229
48	74	F	152.8	58.7	36.2	86.5	25.14151202	225
49	75	F	149.8	50.8	27.1	81	22.63810581	217
50	59	M	168	59	N/A	74	20.90419501	241
51	57	F	159	71	N/A	96	28.08433211	248
52	72	F	142	49	N/A	87	24.30073398	249
53	57	F	151	59	N/A	89	25.87605807	219
54	57	M	163	67	N/A	84	25.21735858	223
55	61	F	155	61	32.3	85	25.39021852	222
56	65	F	147	51	27.4	74.2	23.60127725	217
57	52	F	156	54	N/A	86.5	22.18934911	258
58	60	F	152	64	N/A	91.6	27.70083102	251
59	52	F	148.5	44.1	29.4	79.5	19.99795939	218
60	79	F	135.3	59.6	N/A	100	32.55747131	237
61	59	F	149	51	29.8	83.2	22.9719382	233
62	74	F	148.4	56	31.6	88.5	25.42846971	227
63	68	F	151.9	59.2	33.8	89.2	25.65701683	219
64	65	F	146.1	42.9	26.3	68.9	20.09818596	222
65	83	F	143.1	47	26.3	77.7	22.95189722	247
66	44	F	157.9	44.9	18.8	75.3	18.00868829	236
67	74	M	162.1	71	20.6	N/A	27.02043392	236

Supplementary Table 4. SNP-specific primers for PCR.

Ref_SNPs	Direction	Primer
rs17384360	Forward	5'-TTCCTTACTGCAACCTCCGC-3'
	Reverse	5'TCCTTCACCTTATGTAGAGTGATAAG-3'
rs4617422	Forward	5'-TTCATCCTCCTGCACACCAC-3'
	Reverse	5'AGGTGACAGCAGACTATTTATGAGTC3'
rs3841330	Forward	5'-ACAGGCATCACGTCATCCAAC-3'
	Reverse	5'-AGCAGGCAGTCACATTTTCC-3'
rs3820097	Forward	5'TACTTGGAGAGAATTTCTGGATTGG3'
	Reverse	5'-AGGCGGATGAGGGCGACTAC-3'
rs72480265	Forward	5'-ATCTCCAGCATCTAGTATCC-3'
	Reverse	5'-TGACTCTGAAGTGAAGAGCC-3'
rs4656287	Forward	5'-ATACCAGTCGCTAGCCCTAG-3'
	Reverse	5'-AACTACAGTGATGCAAAAATGATAG3'
rs4523530	Forward	5'-TCCTCTGCTGCCATAATGAAG-3'
	Reverse	5'-ATTGGATAAAGTCTGGATAATG-3'
rs12041364	Forward	5'-TGAGATTGTGCCACCGCACTAC-3'
	Reverse	5'-TGCCTTCAAGTCAACTGTGTC-3'
rs11265560	Forward	5'-TGCCTGGAACATATTAGGAAC-3'
	Reverse	5'AGTGTGTAGTCCCTGCTACTCGGAGG3'
rs12031437	Forward	5'-AGTTCCCATCCTATGAGTCT-3'
	Reverse	5'-TAACAAAGACCAAACCTCAG-3'
rs2301286	Forward	5'AACGCTAACTCCAGCATTAAGCGC-3'
	Reverse	N/A
rs2301287	Forward	5'-TAGATGGATCCTGGCCCTCTG-3'
	Reverse	5'-ACTAGGACCACCTGGCGACAAG-3'
rs11265562	Forward	5'-TCCATCCACTGACTCTGATTC-3'
	Reverse	5'-AAATTATGACCCATAAACTG-3'
rs11265563	Forward	5'-TGGTCTCAAAGTCTAACCTC-3'
	Reverse	5'-TTAGATACAGAAGGAGACAG-3'
rs7512012	Forward	5'-TTGGTAAATCAAACGAGACC-3'
	Reverse	5'-TGCTGGCTAGATGTTATATG-3'
rs1136224	Forward	5'-TGGAGCCTGTTCTCACTGG-3'
	Reverse	5'-TTAGTACTTGACAGAAAGC-3'
rs11421	Forward	5'TCATATTCTTCTTGGCTTCTGGTTC3'
	Reverse	5'-AGTCCATGGCAGTTTTATTGG-3'
rs3813627	Forward	5'AAGGGTTAAATACAGAAAGCAGCTG-3'
	Reverse	5'-TGGAGGTCTACATCTCTCGAAG-3'
rs9725457	Forward	5'-TGCCTTGACCTCTCAAAGTG-3'
	Reverse	5'-AATAATAATAAGGTGCCCTTGTCGG-3'
rs4656293	Forward	5'-AGGATGGTCTCGATCTCCTG-3'
	Reverse	5'-TCAGTATGCTTTTCTGTATCAACC3'
rs6671288	Forward	5'-TGGCCACAGCATAGTAACTATTTAG3'
	Reverse	5'-AAGTCCTGTCTCCTAGAGTCTAGC-3'
rs2501866	Forward	5'-TCTATTTGTAGGCACAGTCTCATC-3'
	Reverse	5'-ATTGAGTGCCAGGTCCTGTTTC-3'

Supplementary Table 5. Characteristics of SNPs.

Annotation of	Ref SNP	Reference genome assembly	Chromosome	MAF	Ref_SNP alleles	Restriction enzyme
1	rs17384360	GRCh37.p5	1	G=0.218/477	G/T	MseI
2	rs4617422	GRCh37.p5	1	A=0.287/628	A/G	AvrII
3	rs3841330	GRCh37.p5	1	A=0.276/603	-/AT	NlaIII
4	rs3820097	GRCh37.p5	1	G=0.143/313	A/G	RsaI
5	rs72480265	GRCh37.p5	1	A=0.101/220	A/G	MspI
6	rs4656287	GRCh37.p5	1	C=0.101/221	C/T	MseI
7	rs4523530	GRCh37.p5	1	T=0.390/852	G/T	NlaIII
8	rs12041364	GRCh37.p5	1	A=0.301/658	A/G	TaqI
9	rs11265560	GRCh37.p5	1	C=0.263/574	C/T	AluI
10	rs12031437	GRCh37.p5	1	G=0.376/821	C/G	HaeIII
11	rs2301286	GRCh37.p5	1	A=0.383/837	A/C	NlaIII
12	rs2301287	GRCh37.p5	1	G=0.376/821	C/G	HpaII/MspI
13	rs11265562	GRCh37.p5	1	A=0.269/587	A/T	MseI
14	rs11265563	GRCh37.p5	1	A=0.266/580	A/G	BstUI/HinP1I
15	rs7512012	GRCh37.p5	1	G=0.308/673	A/G	NaeI
16	rs1136224	GRCh37.p5	1	G=0.169/370	A/G	NlaIII
17	rs11421	GRCh37.p5	1	C=0.212/463	C/T	BfaI
18	rs3813627	GRCh37.p5	1	T=0.338/737	G/T	BfaI
19	rs9725457	GRCh37.p5	1	A=0.344/751	A/G	NlaIII
20	rs4656293	GRCh37.p5	1	T=0.184/402	C/T	AluI
21	rs6671288	GRCh37.p5	1	G=0.136/296	C/G	ApaI
22	rs2501866	GRCh37.p5	1	C=0.274/599	A/G(C/T)	HaeIII

Supplementary Table 6. Frequency of which patients have SNP alleles.

Ref_SNPs	High LDL cholesterol patients			Low LDL cholesterol patients		
	Homozygous minor allele	Heterozygous allele	Homozygous major allele	Homozygous minor allele	Heterozygous allele	Homozygous major allele
rs17384360	2	13	11	1	14	26
rs4617422	2	12	12	7	20	14
rs3841330	1	11	14	1	18	22
rs3820097	1	10	15	1	17	23
rs72480265	1	7	18	1	9	31
rs4656287	1	7	18	1	9	31
rs4523530	11	13	2	14	20	7
rs12041364	9	14	3	12	20	9
rs11265560	8	14	4	12	21	8
rs12031437	11	14	1	14	20	7
rs2301286	11	14	1	14	20	7
rs2301287	11	14	1	14	20	7
rs11265562	9	11	6	12	17	12
rs11265563	8	14	4	13	19	9
rs7512012	0	1	25	0	3	38
rs1136224	1	9	16	4	19	18
rs11421	10	12	4	3	19	19
rs3813627	1	13	12	10	21	10
rs9725457	11	13	2	9	21	11
rs4656293	5	11	10	1	19	21
rs6671288	0	2	24	0	4	37
rs2501866	4	12	10	5	13	23