Dense Genotyping of Candidate Gene Loci Identifies Variants Associated With High-Density Lipoprotein Cholesterol

Andrew C. Edmondson, BS; Peter S. Braund, PhD; Ioannis M. Stylianou, PhD; Amit V. Khera, MD; Christopher P. Nelson, PhD; Megan L. Wolfe, BS; Stephanie L. DerOhannessian, MS; Brendan J. Keating, PhD; Liming Qu, MS; Jing He, MS; Martin D. Tobin, PhD; Maciej Tomaszewski, MD, FAHA; Jens Baumert, PhD; Norman Klopp, PhD; Angela Döring, MD; Barbara Thorand, PhD, MPH; Mingyao Li, PhD; Muredach P. Reilly, MBBCh; Wolfgang Koenig, MD, FRCP, FESC, FACC, FAHA; Nilesh J. Samani, MD, FRCP, FMedSci; Daniel J. Rader, MD

Background—Plasma levels of high-density lipoprotein cholesterol (HDL-C) are known to be heritable, but only a fraction of the heritability is explained. We used a high-density genotyping array containing single-nucleotide polymorphisms (SNPs) from HDL-C candidate genes selected on known biology of HDL-C metabolism, mouse genetic studies, and human genetic association studies. SNP selection was based on tagging SNPs and included low-frequency nonsynonymous SNPs.

Methods and Results—Association analysis in a cohort containing extremes of HDL-C (case-control, n=1733) provided a discovery phase, with replication in 3 additional populations for a total meta-analysis in 7857 individuals. We replicated the majority of loci identified through genome-wide association studies and present on the array (including *ABCA1, APOA1/C3/A4/A5, APOB, APOE/C1/C2, CETP, CTCF-PRMT8, FADS1/2/3, GALNT2, LCAT, LILRA3, LIPC, LIPG, LPL, LRP4, SCARB1, TRIB1, ZNF664*) and provide evidence that suggests an association in several previously unreported candidate gene loci (including *ABCG1, GPR109A/B/81, NFKB1, PON1/2/3/4*). There was evidence for multiple, independent association signals in 5 loci, including association with low-frequency nonsynonymous variants.

Conclusions—Genetic loci associated with HDL-C are likely to harbor multiple, independent causative variants, frequently with opposite effects on the HDL-C phenotype. Cohorts comprising subjects at the extremes of the HDL-C distribution may be efficiently used in a case-control discovery of quantitative traits. **(*Circ Cardiovasc Genet*. 2011;4:145-155.)**

Key Words: lipids ■ genetic association studies ■ cholesterol HDL ■ cardiovascular diseases

Elevated high-density lipoprotein cholesterol (HDL-C) concentration is associated with decreased risk of atherosclerotic cardiovascular disease independent of low-density lipoprotein cholesterol concentration.[1] The HDL particle comprises phospholipid, cholesterol, triglyceride, and a variety of proteins[2] and is believed to exert its antiatherosclerotic effects through a process called reverse cholesterol transport, where the HDL particle promotes the efflux of cholesterol from extrahepatic tissues and cells (particularly macrophages) and delivers it to the liver for excretion in the bile.[3] The HDL particle is generated, matured, and catabolized[4] through a complex series of processes presenting many discrete biological steps at which genetic perturbations could profoundly affect HDL concentration. Although the heritability of HDL-C concentration is estimated at ≈50%,[5] the precise genetic players and the extent to which each of these factors affects HDL-C concentration in the general population is largely unknown.

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Genome-wide association studies (GWAS) have identified several genetic loci contributing to variation in plasma lipids,

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From the Institute for Translational Medicine and Therapeutics (A.C.E., I.M.S., A.V.K., M.L.W., S.L.D., B.J.K., M.P.R., D.J.R.), Department of Biostatistics and Epidemiology (L.Q., J.H., M.L.), and Cardiovascular Institute (M.P.R., D.J.R.), University of Pennsylvania School of Medicine, Philadelphia, PA; Department of Cardiovascular Sciences (P.S.B., C.P.N., M.T., N.J.S.) and Department of Health Sciences (M.D.T.), University of Leicester, Leicester, UK; Leicester NIHR Biomedical Research Unit in Cardiovascular Disease (M.T., N.J.S.), Glenfield Hospital, Leicester, UK; Institute of Epidemiology (J.B., N.K., A.D., B.T.), Helmholtz Zentrum München, German Research Center for Environmental Health, Neuherberg, Germany; and Department of Internal Medicine II-Cardiology (W.K.), University of Ulm Medical Center, Ulm, Germany.

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Correspondence to Daniel J. Rader, MD, University of Pennsylvania School of Medicine, 654 BRBII/III Labs, 421 Curie Blvd, Philadelphia, PA 19104-6160. E-mail rader@mail.med.upenn.edu

Table 1. Baseline Characteristics

Cohort	Penn-CC Cohort Cases (n=695)	Penn-CC Cohort Controls (n=1038)	Penn-RC (n=2752)	MONICA/KORA (n=1544)	GRAPHIC (n=2020)
Ascertainment	Physician referral, HDL >90th percentile	Physician referral, HDL <30th percentile	Community-based, prospective cohort	Community-based, prospective cohort	Family-based, population cohort
Mean age, y	57.82±14.75	60.00±12.66	54.72±10.10	52.49±10.49	39.32±14.50
Women, %	48.9	38.8	33.8	44.4	49.5
Mean HDL, mg/dL	90.12±20.57	35.06±6.24	49.00±13.51	55.65±16.73	55.80±14.18
Range HDL, mg/dL	60–186	20–50	9–164	2–142	19.5–124.8

Data are presented as mean±SD, unless otherwise indicated. GRAPHIC, indicates Genetic Regulation of Arterial Pressure of Humans in the Community; HDL, high-density lipoprotein; MONICA/KORA, Monitoring of Trends and Determinants in Cardiovascular Disease/Cooperative Health Research in the Region of Augsburg; Penn-CC, University of Pennsylvania case-control; Penn-RC, University of Pennsylvania replication cohort.

including HDL-C.[6] Many of the identified loci contain genes previously implicated in lipid metabolism either through identified Mendelian disorders of lipid metabolism or by biochemical and cell biology investigations of lipid metabolism. GWAS also have identified novel loci that may elucidate previously unsuspected pathways that regulate lipid metabolism. However, the commercially available GWAS platforms suffer from uneven genomic SNP coverage, and SNP coverage in some of the HDL-C candidate genes is particularly poor. In addition, they are designed to assay a sample of common single-nucleotide polymorphisms (SNPs) (minor allele frequency [MAF] >0.05) across the entire genome rather than to provide comprehensive, dense genotyping, including low-frequency variants. Furthermore, all GWAS to date have been performed in subjects unselected on the basis of lipid traits. Population-based resequencing studies of HDL-C candidate genes have suggested that both common and rare associated variants are concentrated in subjects at the extremes of the HDL-C distribution,[7,8] suggesting that studies in subjects from the extremes of the HDL-C distribution may be more powerful than similarly sized population cohorts, particularly for identifying low-frequency variants associated with the HDL-C phenotype.

HDL-C candidate gene studies have been performed previously, looking at a variable number of HDL-C candidate genes.[9] For many of these studies, subsequent studies to replicate their results have failed. Lack of replication likely is due to multiple causes, including studying a limited number of variants in the candidate genes and small sample sizes, with many of the studies analyzing different variants for the same candidate genes.[9,10]

To address these concerns, we participated in a collaboration among the University of Pennsylvania (UPenn) Institute of Translational Medicine and Therapeutics (ITMAT); the Broad Institute; and the National Heart, Lung, and Blood Institute-supported Candidate-Gene Association Resource (CARe) Consortium to develop the ITMAT-Broad-CARe (IBC) cardiovascular gene array[11] using Illumina Infinium technology.[12,13] This array was designed to include 66 HDL-C candidate gene loci (online-only Data Supplement Table 1). Candidate genes were chosen on the basis of known biology of HDL metabolism, data from mouse genetic studies, published human genetic association studies, and the first reports of lipid-related GWAS data. The IBC cardiovascular gene array also included low-frequency and rare nonsynonymous variants with potential phenotypic consequences.

We used an extreme HDL-C case-control study design as a discovery cohort to assess association of 2415 SNPs in 66 HDL-C candidate genes and replicated our findings in 3 cohorts comprising subjects unselected on the basis of lipid traits. The dense SNP coverage of candidate genes on the IBC array and the inclusion of low-frequency nonsynonymous variants enabled us to identify multiple nonsynonymous SNPs in candidate genes with suggestive evidence of association with HDL-C and that may help to explain the association signal. Additionally, we were able to identify several genes with multiple, independent SNPs significantly associated with HDL-C.

Methods

Subjects

Discovery Cohort

The UPenn HDL Case-Control study comprises subjects with extreme levels of HDL-C who were recruited through the hospital of the UPenn clinical laboratory. The UPenn Institutional Review Board approved the study protocol. The UPenn Catheterization cohort comprises consecutive subjects undergoing coronary angiography at UPenn Health System hospitals and has been previously described.[14] In the present study, unrelated subjects of European ancestry with HDL >90th percentile for age and sex were analyzed as cases (n=695), and subjects with HDL <30th percentile for age and sex were analyzed as controls (n=1038).

Three Replication Cohorts

The UPenn Replication Cohort (Penn-RC), the Monitoring of Trends and Determinants in Cardiovascular Disease/Cooperative Health Research in the Region of Augsburg (MONICA/KORA) Augsburg study, and the Genetic Regulation of Arterial Pressure of Humans in the Community (GRAPHIC) study were used for replication analysis. Genotypes and HDL-C were available for up to 2752 Penn-RC subjects, 1544 MONICA/KORA Augsburg subjects, and 2020 GRAPHIC subjects. Each study's respective institutional review board approved the study protocols, and informed consent was obtained from all subjects.

Statistical Analyses

Genotypes were obtained using the HumanCVD BeadChip (Illumina). For quality control, we eliminated SNPs with a genotype call rate <95%, with MAF<0.01 in Penn-RC controls, or with a significant departure from Hardy-Weinberg equilibrium ($P<1\times10^{-6}$ in combined cases and controls). We also eliminated individuals with <97.5% of the array SNPs successfully genotyped.

Table 2. Most Significant SNP for Each Candidate Locus in Meta-Analysis

					Penn-CC			Penn-RC			MONICA/KORA			GRAPHIC			Meta-Analysis		
Locus	SNP	A1	A2	MAF	*T*	*P*	n	*T*	*P*	n	*T*	*P*	n	*z*	*P*	n	*z*	*P*	n
CETP	rs17231506	A	G	0.30	7.57	3.82E-14	1600	6.25	4.68E-10	2691	6.84	1.12E-11	1536	7.83	5.00E-15	2020	14.04	8.85E-45	7847
LPL	rs264	A	G	0.15	3.57	3.60E-04	1599	3.54	4.13E-04	2691	2.73	6.39E-03	1543	3.63	2.87E-04	2019	6.73	1.75E-11	7852
LIPG	rs2156552	A	T	0.14	−4.07	4.80E-05	1600	−2.30	2.16E-02	2693	−0.95	3.40E-01	1543	−3.37	7.48E-04	2020	−5.31	1.09E-07	7856
APOE/C1/C2	rs2075650	G	A	0.13	−2.34	1.93E-02	1600	−4.15	3.46E-05	2693	−2.31	2.12E-02	1544	−1.36	1.73E-01	2020	−5.19	2.07E-07	7857
FADS1/2/3	rs174570	A	G	0.11	−2.95	3.22E-03	1600	−2.92	3.52E-03	2693	−2.65	8.16E-03	1543	−1.41	1.58E-01	2020	−4.93	8.37E-07	7856
LIPC	rs588136	G	A	0.22	2.36	1.83E-02	1585	2.10	3.63E-02	2670	3.38	7.58E-04	1531	2.19	2.89E-02	2020	4.89	1.01E-06	7806
APOA1/A4/A5/C3	rs12287066*	A	C	0.08	−2.81	5.03E-03	1600	−2.05	4.03E-02	2691	−1.61	1.07E-01	1540	−1.65	9.89E-02	2019	−4.02	5.87E-05	7850
ABCG1	rs914189	C	G	0.21	2.34	1.93E-02	1600	2.78	5.50E-03	2693	1.20	2.29E-01	1544	1.51	1.32E-01	2020	3.98	6.97E-05	7857
APOB	rs1801695*	A	G	0.03	2.87	4.05E-03	1600	2.72	6.59E-03	2693	0.50	6.14E-01	1544	1.65	9.80E-02	2020	3.95	7.80E-05	7857
ABCA1	rs3905001	G	C	0.28	1.53	1.27E-01	1598	1.74	8.17E-02	2693	1.85	6.52E-02	1540	2.43	1.51E-02	2020	3.76	1.71E-04	7851
GPR109A/B/81	rs3922628	T	A	0.22	2.61	8.97E-03	1597	1.13	2.58E-01	2684	0.56	5.73E-01	1434	3.12	1.81E-03	2017	3.69	2.23E-04	7732
SCARB1	rs838878	A	G	0.34	1.82	6.93E-02	1600	1.70	8.85E-02	2693	1.94	5.23E-02	1543	1.59	1.12E-01	2020	3.48	4.94E-04	7856
PON1/2/3/4	rs7493*	G	C	0.24	2.03	4.22E-02	1600	0.66	5.10E-01	2693	2.36	1.86E-02	1543	2.20	2.81E-02	2019	3.46	5.42E-04	7855
NFKB1	rs3774964	G	A	0.36	2.62	8.90E-03	1600	2.03	4.30E-02	2693	−0.06	9.55E-01	1539	2.05	4.00E-02	2020	3.38	7.19E-04	7852
PCSK6	rs1471656	A	G	0.45	2.02	4.31E-02	1600	1.35	1.77E-01	2693	2.39	1.72E-02	1538	1.19	2.35E-01	2020	3.36	7.75E-04	7851
PCSK5	rs1340510	G	A	0.28	1.41	1.59E-01	1599	2.42	1.54E-02	2692	2.94	3.39E-03	1542	−0.49	6.24E-01	2019	3.10	1.91E-03	7852
GALNT2	rs2144300	G	A	0.44	−2.07	3.90E-02	1600	−2.32	2.02E-02	2692	–0.43	6.64E-01	1542	−1.18	2.37E-01	2020	−3.08	2.05E-03	7854
LCAT	rs2292318	A	G	0.14	0.00	9.96E-01	1600	1.22	2.24E-01	2693	2.48	1.33E-02	1509	2.37	1.76E-02	2020	3.01	2.62E-03	7822
PPARD	rs2016520	G	A	0.23	1.83	6.70E-02	1600	2.05	4.06E-02	2693	0.73	4.67E-01	1544	0.97	3.31E-01	2020	2.84	4.51E-03	7857
PLTP	rs378114	A	G	0.29	1.91	5.60E-02	1598	1.17	2.43E-01	2693	0.65	5.18E-01	1543	1.97	4.83E-02	2020	2.83	4.60E-03	7854
SOAT1	rs4421551	C	A	0.14	2.55	1.08E-02	1600	2.12	3.40E-02	2690	0.90	3.68E-01	1530	0.06	9.56E-01	2020	2.82	4.81E-03	7840
LRP2	rs34291900*	A	G	0.03	−0.66	5.11E-01	1600	−3.16	1.59E-03	2693	−1.49	1.38E-01	1544	0.10	9.17E-01	2020	−2.75	5.95E-03	7857

A, indicates allele; MAF, minor allele frequency from Penn-RC; and SNP, single-nucleotide polymorphism. Other abbreviations as in Table 1.
*Nonsynonymous SNP.

Table 3. Conditional Analyses

	First					Second					Third				
Gene	SNP	*P*	D	MAF	AA Change	SNP	*P*	D	MAF	AA Change	SNP	*P*	D	MAF	AA Change
CETP	rs289714	2.19×10^{-15}	−	0.21	−	rs5883	1.98×10^{-5}	+	0.06	F287F	rs5880	4.40×10^{-4}	−	0.04	P390A
LPL	rs3208305	1.19×10^{-4}	+	0.32	−	rs255	2.36×10^{-4}	+	0.16	−					
LIPG	rs77960347	7.46×10^{-4}	+	0.01	N396S										
APOA1/A4/A5/C3	rs12099358	4.11×10^{-6}	+	0.18	−										
ABCA1	rs2740487	6.36×10^{-4}	+	0.42	−										

Genotypes of the most significantly associated SNP from each of the top 14 loci were included as covariates in the association analysis: rs17231506 (*CETP*), rs264 (*LPL*), rs2156552 (*LIPG*), rs2075650 (*APOE/C1/C2*), rs174570 (*FADS1/2/3*), rs588136 (*LIPC*), rs12287066 (*APOA1/A4/A5/C3*), rs914189 (*ABCG1*), rs1801695 (*APOB*), rs3905001 (*ABCA1*), rs3922628 (*GPR109A/B/81*), rs838878 (*SCARB1*), rs7493 (*PON1/2/3/4*), and rs3774964 (*NFKB1*). D indicates direction. Other abbreviations as in Table 2.

The discovery cohort was analyzed using a case-control design and multiple logistic regression to test the association of each SNP. The replication cohorts were analyzed with multiple linear regression to test the association of each SNP with HDL-C after adjusting for age and sex under an additive model of inheritance. All analyses were conducted using PLINK software.[15]

All candidate gene SNPs were tested in the replication cohorts. Each study was analyzed separately, and to summarize the data, a meta-analysis was implemented using METAL software,[16] which uses the *P* value and the direction of the effect to calculate a *z* statistic. Individual *z* statistics were combined in an overall *z* statistic, which was calculated as a weighted sum of each of the individual study *z* statistics (where weights were proportional to the square root of the number of individuals examined in each sample and selected such that the squared weights sum to 1). The corresponding *P* value was then calculated. A *P* value significance threshold of $<2.03\times10^{-5}$ in the meta-analysis was determined based on the conservative Bonferroni correction (0.05/2459 tests), and a $P<0.05$ suggested an association with HDL-C.

Conditional analyses were performed by incorporating genotypes of the most significantly associated SNP from each associated locus as covariates simultaneously in the association analyses to identify any residual association signal from additional independent SNPs associated with HDL-C. The conditional analysis was performed as a forward step-wise regression, adding the genotypes of the highest remaining associated SNPs in each locus as covariates in an iterative process until there was no longer any evidence of association with HDL. This analysis was performed using a gene-based Bonferroni correction for the total number of candidate genes tested (0.05/66 genes, $P<7.6\times10^{-4}$). Each study was analyzed separately, and the data were summarized using the METAL software.[16] Additional information is available in the online-only Data Supplement Methods.

Results

Extreme Case-Control Discovery

A total of 2415 SNPs were analyzed for 66 candidate genes in a case-control cohort comprising individuals from the extremes of the HDL-C phenotypic distribution (Table 1). After removing very-low-frequency (MAF <0.01 in controls) and poorly performing SNPs, 31 SNPs from 3 candidate genes (*CETP, LIPG, LPL*) reached the threshold for significance in the discovery data set based on the conservative Bonferroni correction (0.05/2415 SNPs, $P<2.1\times10^{-5}$). An additional 293 SNPs from 39 further candidate genes suggested evidence of association (uncorrected $P<0.05$) (online-only Data Supplement Table 2).

Replication Study

Because the association of these SNPs was identified through a case-control cohort ascertained from the extremes of a quantitative trait, an attempt was made to replicate these results in the following 3 cohorts unselected on the basis of lipid traits to verify that these SNPs are associated with the quantitative trait of HDL-C: 1 US cohort of individuals of European descent (Penn-RC) and 2 European cohorts (MONICA/KORA and GRAPHIC). We analyzed the 324 SNPs with suggestive or significant evidence of association in the case-control discovery cohort (uncorrected $P<0.05$). Results from the replication cohorts were combined using the METAL software (individual cohort and the combined replication analysis results are available in online-only Data Supplement Table 2). All 31 of the SNPs reaching the threshold for significance in the discovery cohort were replicated at a significance threshold of $P<0.05$ in the combined replication analysis, and 40 SNPs from 4 genes (*CETP*, *LPL*, *APOE*, *LIPC*) were replicated with $P<2.1\times10^{-5}$ in the combined replication analysis.

Meta-Analysis

A meta-analysis was performed for the HDL candidate genes across all 4 cohorts (discovery and the 3 replication cohorts) in a total of 7857 subjects. Seventy-two SNPs from 6 candidate genes (*APOE, CETP, FADS1/2/3, LIPC, LIPG, LPL*) reached our Bonferroni-corrected level of significance (online-only Data Supplement Table 3). All of these candidate loci have been previously reported to be significantly associated with HDL-C. Of the 31 SNPs significantly associated in the discovery cohort, only 1 failed to reach the significance threshold in the meta-analysis (a *CETP* SNP, rs11076174; meta $P=1.0\times10^{-4}$). Similarly, of the 72 SNPs significantly associated with HDL-C in the meta-analysis, only 1 did not exhibit suggestive association in the discovery cohort (an *LIPC* SNP, rs261338; meta-analysis $P=1.27\times10^{-5}$; UPenn HDL Case-Control study, $P=0.16$). A total of 374 SNPs in 42 candidate genes had suggestive evidence of association after meta-analysis ($P<0.05$) (online-only Data Supplement Table 3). The most significant SNP for each candidate gene with at least 1 SNP exhibiting a $P<0.01$ is presented in Table 2. Notably, the most significantly

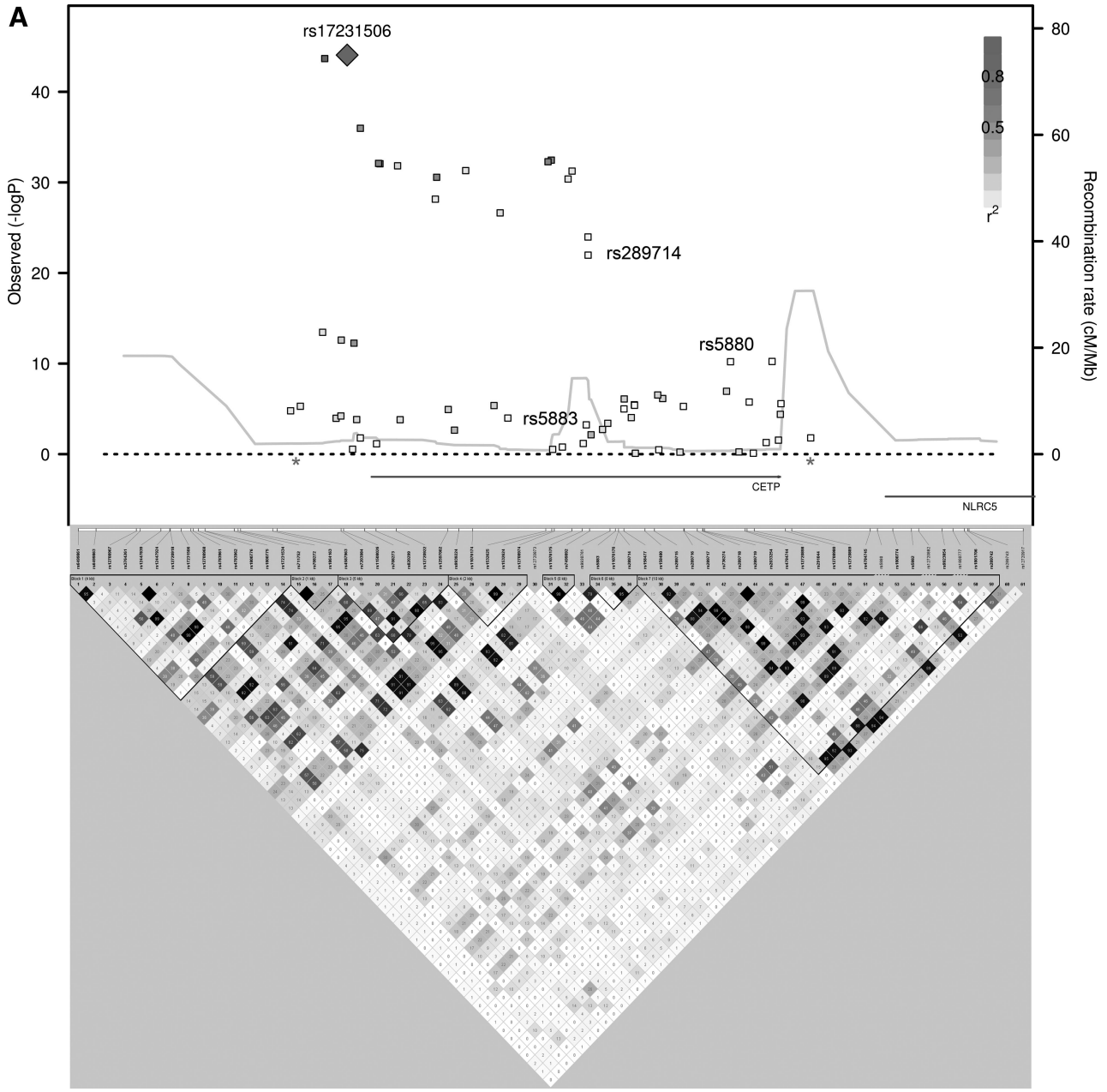


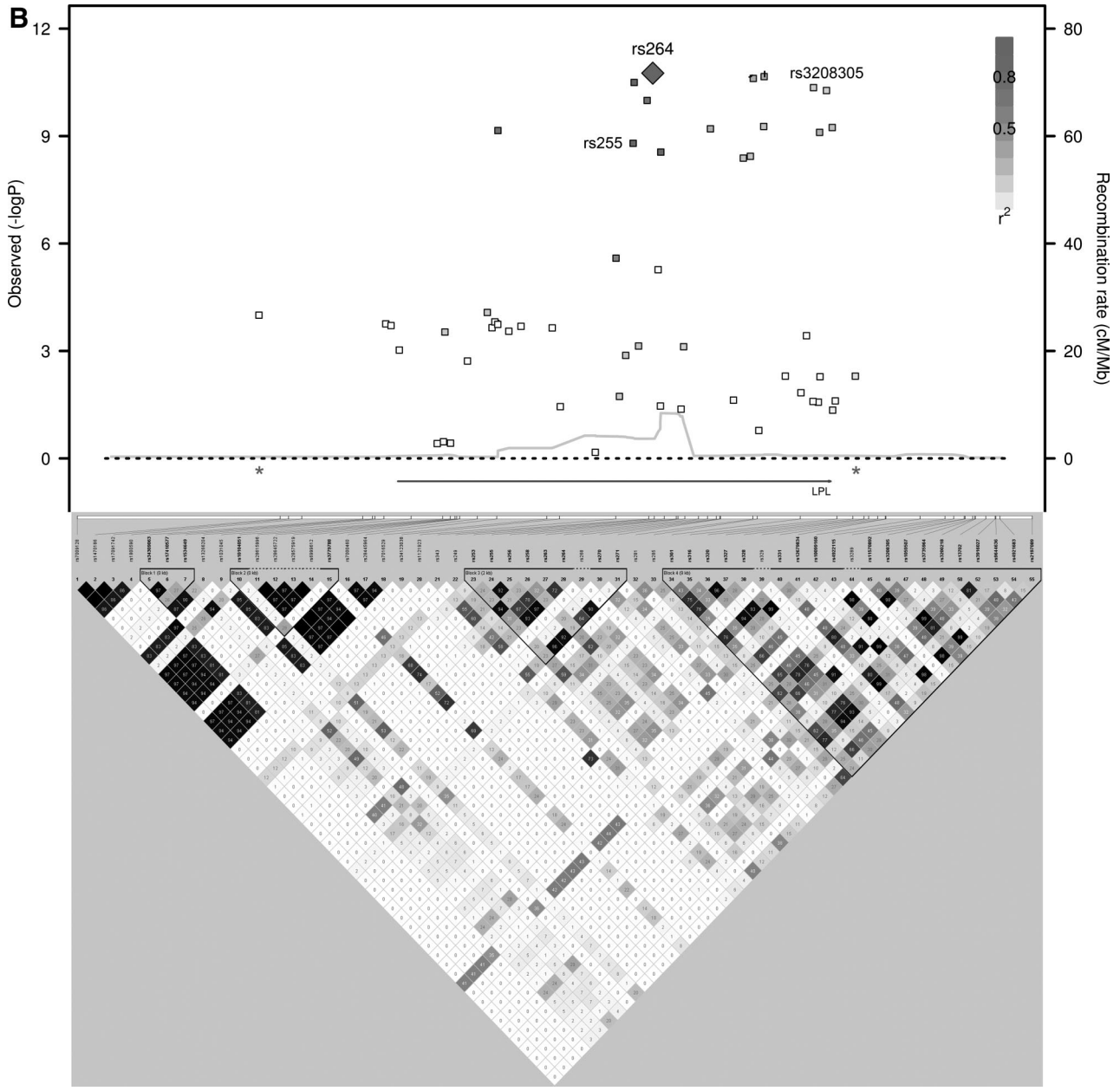
Figure. High-density lipoprotein cholesterol regional association plots. *P* values are from single-nucleotide polymorphisms in loci with multiple, independent association signals. CETP (**A**), LPL (**B**), LIPG (**C**), APOA1/A4/A5/C3 (**D**), and ABCA1 (**E**) are plotted with linkage disequilibrium plots, which have been enlarged to show the region between the asterisks.

associated SNP for several of the loci (*APOA5*, *APOB*, *PON2*, *LRP2*) were nonsynonymous variants I44M (rs12287066), A4481T (rs1801695), S311C (rs7493), and G669D (rs34291900), respectively. In addition, many of the candidate genes had nonsynonymous SNPs associated with HDL-C, although these SNPs may not have been the most significantly associated SNP. Online-only Data Supplement Table 4 lists all the nonsynonymous SNPs in the candidate genes suggestively associated with HDL-C ($P<0.05$).

Many of the most significant SNPs associated with HDL-C in first-generation GWAS were included on the IBC array. A few additional SNPs from late first-generation GWAS were included on the second version of the IBC array, which was genotyped in only 1 of the subcohorts of Penn-RC, the UPenn Coronary Artery Calcification cohort. Previous GWAS SNPs were examined in all cohorts and in the meta-analysis (online-only Data Supplement Table 5). We replicated 47 of 65 testable SNPs, and 17 of 28 testable loci at $P<0.05$, including the recently reported loci near the *LILRA3*, *LRP4*, *SCARB1*, *TRIB1*, and *ZNF648* genes.[6]

Conditional Analyses

We used a forward step-wise regression analysis to identify additional independent association signals at the most significantly associated loci. Using a gene-based Bonferroni correction for the total number of candidate genes tested (0.05/66 genes, $P<7.6\times10^{-4}$), 14 candidate loci contained SNPs associated with HDL-C. Genotypes of the



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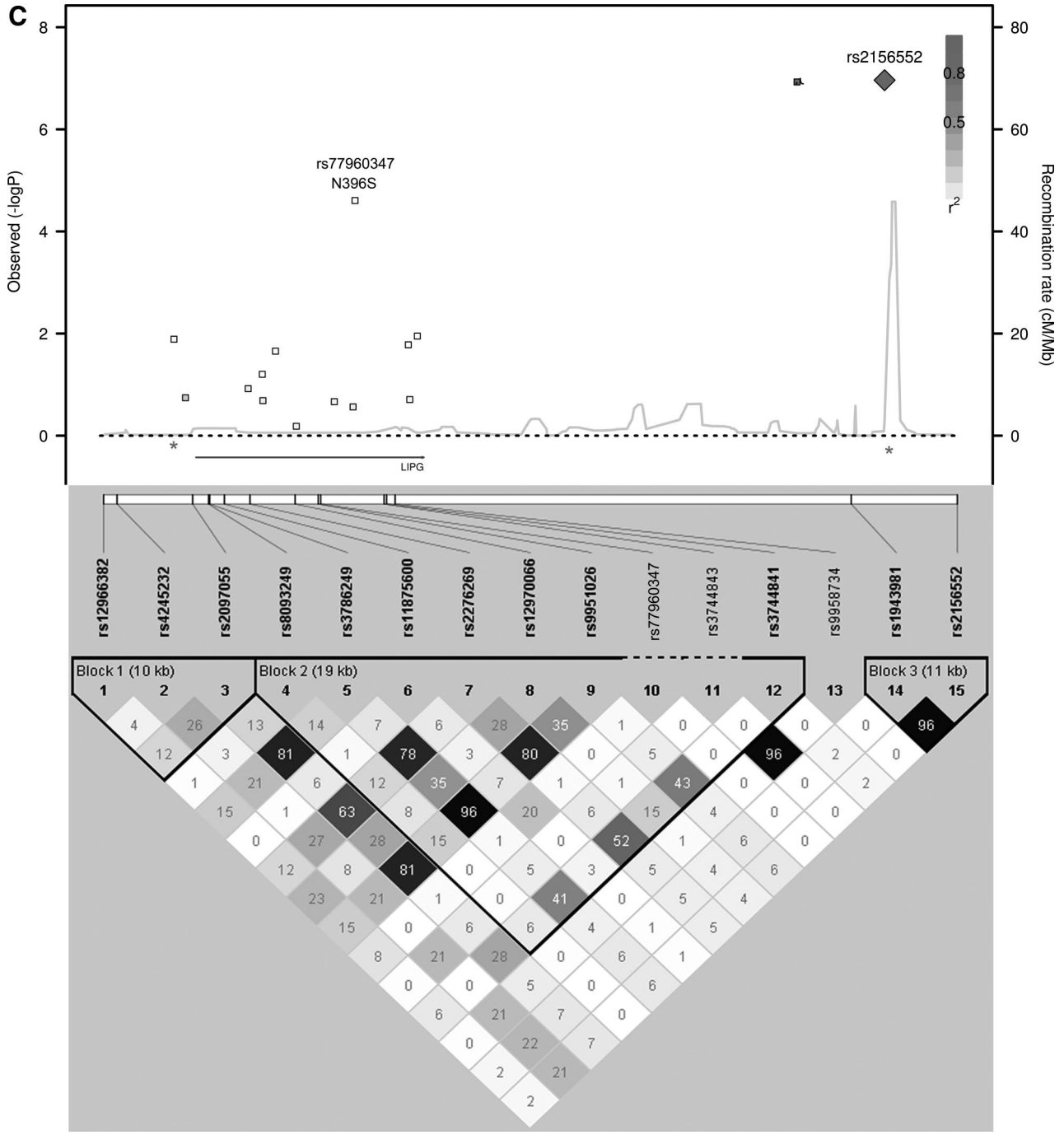
most significantly associated SNPs from each of these 14 loci were simultaneously included as covariates in the association analyses. Additional independently associated SNPs were identified, and their genotypes were included as covariates in the association analyses in an iterative process to identify all the independently associated SNPs in these 14 loci. Five of the candidate gene loci had evidence of multiple independent HDL-C association signals, sometimes with the minor alleles of the independently associated SNPs having opposite directions of effect (Table 3, Figure). Combining the 22 independent SNPs identified in this manner, the proportion of variance of HDL-C explained was 6.4% in Penn-RC, 8.2% in MONICA/KORA, and 8.0% in the GRAPHIC founders, or ≈13% to 16% of the heritability was explained.

Discussion

The present study represents a comprehensive candidate gene approach to identifying loci affecting HDL-C in humans, genotyping genes selected based on known biology of HDL metabolism, data from mouse studies, published genetic association studies, and available first-generation GWAS data (online-only Data Supplement Table 1). An extreme HDL phenotype case-control cohort was used for discovery purposes, with extensive replication in populations unselected for lipids. We also used these studies to perform a meta-analysis of >7800 individuals. The extreme case-control discovery cohort design for the quantitative trait HDL-C appeared to efficiently identify associated SNPs. All 31 SNPs reaching the significance threshold in the discovery cohort replicated at a significance threshold of $P<0.05$, and all but 1 were



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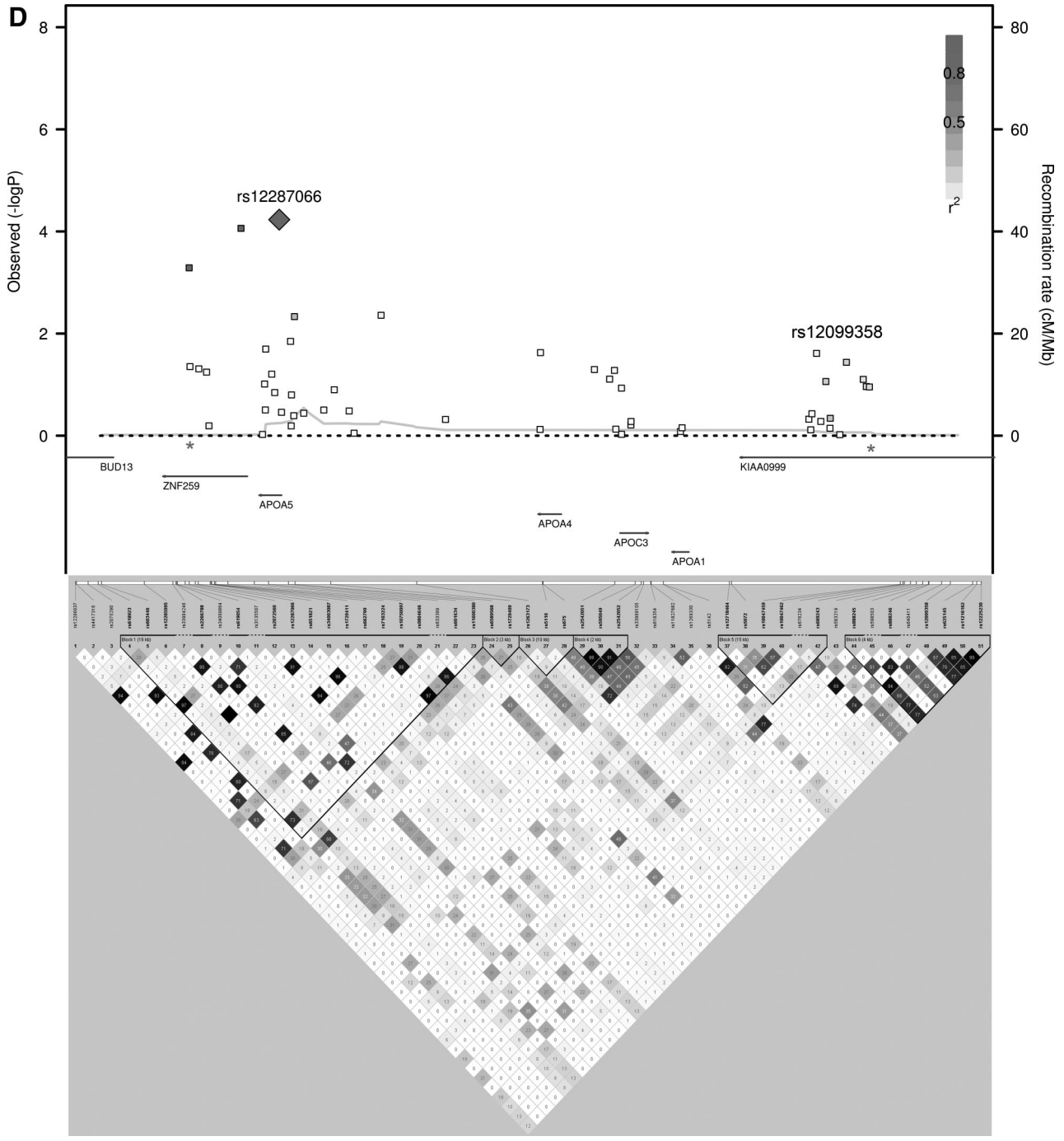
significantly associated in the meta-analysis. All of the 40 SNPs significantly associated with HDL-C in the combined quantitative trait locus analysis using studies unselected for lipids (used in this article to replicate the discovery cohort results) were at least suggestively associated in the discovery cohort. Similarly, only 1 of 72 total SNPs reaching the significance threshold after meta-analysis failed to be even nominally associated in the discovery cohort. Additionally, cohorts comprising extreme cases may be ideally suited for identifying low-frequency, causative alleles of large effect in candidate loci when such alleles are adequately represented. The IBC array allowed higher-density genotyping than commercially available genome-wide platforms with targeted coverage of candidate genes and an emphasis on potentially functional coding variants.

Several of the HDL-C GWAS loci reported to date are replicated here, and suggestive evidence for an association with HDL-C for several additional candidate genes is provided, many of which have not been reported in GWAS to date and may be poorly covered on commercially available platforms.[11] Prior candidate gene studies have explored many of these loci with variable results likely because of small sample sizes and limited genotyping.[9,10] Interest in these loci persists because of compelling biological and animal data,



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such as for *ABCG1*, *GPR109A*, and *PCSK5*. *ABCG1* knockout mice exhibit decreased HDL-C on a high-fat diet and *ABCG1* has been shown to mediate cholesterol efflux to HDL.[17,18] GPR109A has been shown to be the receptor for nicotinic acid,[19] which is used clinically to raise HDL-C levels. PCSK5 is a proprotein convertase that has been shown to modulate HDL-C levels through inactivation of endothelial lipase.[20,21] A genetic variant in *PCSK5* also was recently shown to segregate with low HDL-C in a human pedigree.[22]

Evidence also exists for multiple independent associations with HDL-C within 5 loci (*CETP*, *LPL*, *LIPG*, *APOA1/A4/A5/C3*, *ABCA1*), consistent with the findings published by Talmud et al[23] using the same IBC array. They identified multiple independent associations with HDL-C in *CETP*, *LPL*, *LIPC*, and *APOA5*. A recent meta-analysis of 46 lipid GWAS also identified 6 HDL-C loci with at least a second independent association with HDL-C, including *LPL*, *ABCA1*, *APOA1/A4/A5/C3*, *ZNF664*, *LIPC*, and *CETP*.[6] We note in the present study that the minor alleles of the SNPs that are independently associated may have effects in opposite directions and suggest that genes harbor multiple causative variants across the frequency spectrum from common to rare variants. As an example, we replicated the previously published finding in the endothelial lipase gene *LIPG*, show-

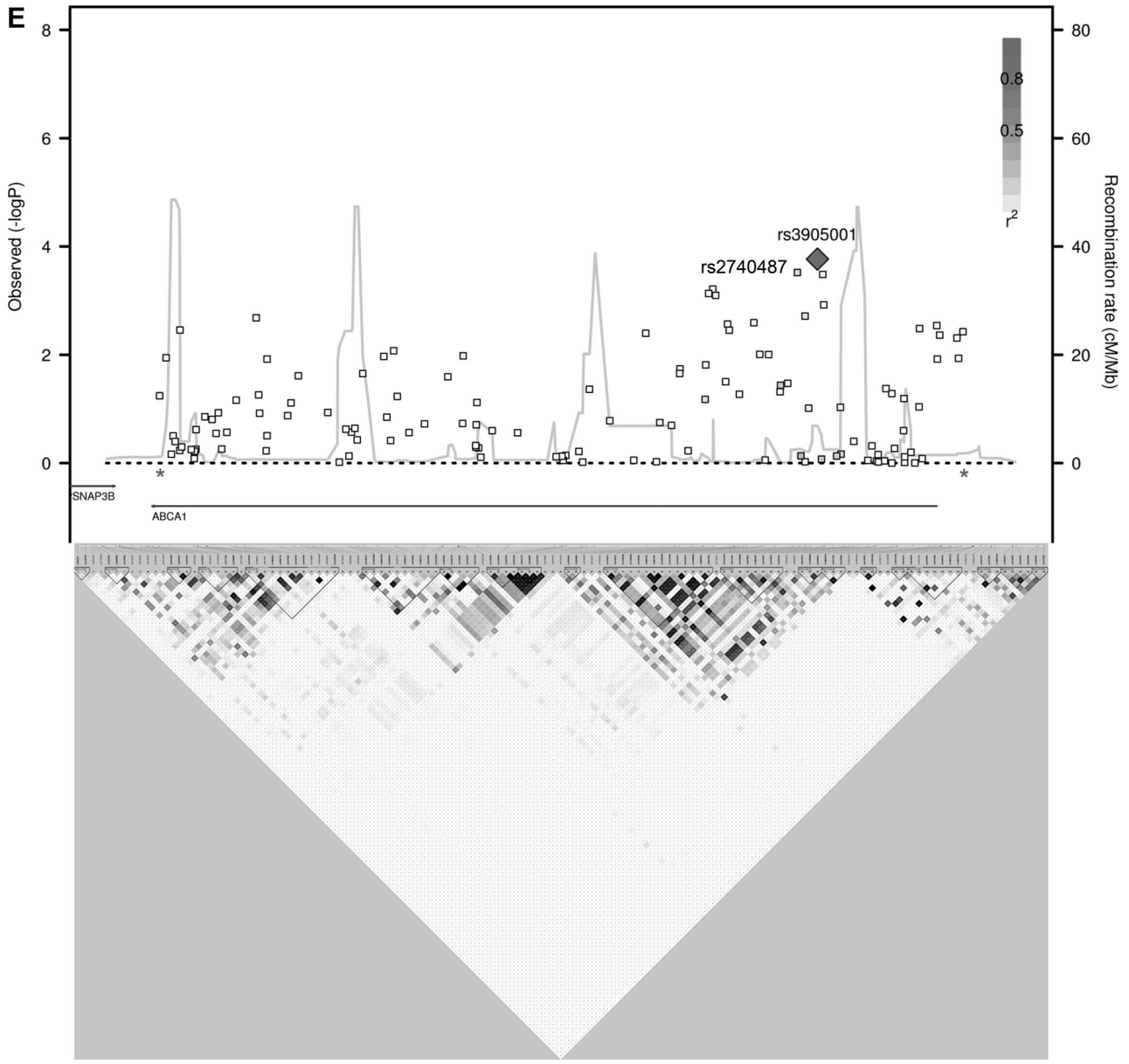

Figure (Continued).

ing that common SNPs 3′ to the gene and the low-frequency nonsynonymous variant N396S (rs77960347) independently associate with HDL-C.[8] The 3′ SNPs may affect transcript levels, whereas the N396S variant has been shown to have reduced phospholipase activity in vitro and in vivo.[8]

It is also possible that a single locus may harbor >1 causative gene, which may be the case at the *APOA1/A4/A5/C3* locus. We identified 2 independent signals in the region: 1 being the *APOA5* nonsynonymous variant I44M (rs12287066) and 1 being a noncoding SNP nearer *APOA1* (rs12099358) (Figure D). Interestingly, meta-analysis of 46 GWAS also identified 2 independent SNPs in the locus, with the first SNP near *APOA5* and the second SNP near *APOA1*. Furthermore, Chasman et al[24] showed that triglyceride phenotype associations accumulate near *APOA5*, but HDL-related phenotypic associations predominate near *APOA1*, suggesting 2 independent effects at the locus from possibly 2 different genes.

The present analysis identified nonsynonymous variants as the most highly associated variants with HDL-C for *APOA5*, *APOB*, *PON2*, and *LRP2* (Table 2). We identified several other nonsynonymous variants that although not the SNP with the strongest evidence for association with HDL-C for the gene, may nonetheless have real and important effects on HDL-C levels. Specifically, 2 of our candidate loci (*CETP* and *LIPG*) harbor nonsynonymous variants significantly associated with HDL-C independent of the most significantly associated SNPs in the gene. It is possible that some of the other nonsynonymous SNPs identified in our study also are independently associated with HDL-C, but our study continues to be underpowered to detect the independent association. GWAS platforms emphasizing common variants (MAF >0.05) are likely to miss low-frequency nonsynonymous variants, which are difficult to impute because of their low frequency. The higher power (and larger numbers) needed to

identify low-frequency causative variants suggest that even larger sample sizes analyzed on the IBC array may be able to identify rare nonsynonymous causative variants.

It is important to note that association, even of nonsynonymous variants, is not necessarily indicative of causality. The *APOB* SNP with the most significant HDL-C association in a meta-analysis of 46 GWASs was the nonsynonymous variant S4338N (rs1042034, MAF=0.22),[6] which is in strong linkage disequilibrium (r^2=0.98) with another nonsynonymous *APOB* variant, P2739R (rs676210, MAF=0.22), also significantly associated with HDL-C in the meta-analysis. Both variants are associated with HDL-C in the present study. The most significant *APOB* SNP in our study (A4481T, rs1801695, MAF=0.03) was unavailable in a majority of the 46 GWAS in the meta-analysis, even after imputation. Additional studies with these nonsynonymous variants will be necessary to determine which, if any, of these variants affect protein function and influence HDL-C.

In conclusion, this HDL-C candidate gene association study in >7800 individuals, using a dense genotyping array, provides evidence that a single locus associated with HDL-C may harbor multiple causative variants, sometimes with effects in opposite directions, and with various putative mechanisms of effect. The present study replicates many previously reported GWAS loci and provides suggestive evidence of association with HDL-C for several additional candidate genes. Furthermore, this study provides evidence that the extreme case-control discovery cohort design for studying quantitative traits can be efficiently used to identify associated SNPs.

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CLINICAL PERSPECTIVE

Plasma levels of high-density lipoprotein cholesterol (HDL-C) are known to be heritable, but only a fraction of the heritability is explained. This study used a high-density genotyping array containing single-nucleotide polymorphisms (SNPs) from HDL-C candidate genes selected on known biology of HDL-C metabolism, mouse genetic studies, and human genetic association studies to explore the genetic architecture of HDL-C. The custom array increased coverage of priority HDL-C candidate gene regions beyond that currently available on commercially available platforms and included numerous low-frequency nonsynonymous SNPs. Resequencing of individuals at the extremes of quantitative trait distributions and population-based resequencing suggest that both common and rare associated variants are concentrated in subjects at the extremes of quantitative trait distributions, including HDL-C. Our study used an extreme HDL-C case-control design and highlights the potential of performing discovery genotyping in a population selected from extremes of a quantitative trait. Our study replicated many previously reported human genetic associations with HDL-C and found evidence for multiple, independent association signals in 5 of these loci, including association with low-frequency nonsynonymous variants and independent SNPs with effects in the opposite direction of the most significantly associated SNP in the candidate gene region. These results suggest that some of the missing heritability is contained in additional alleles within the allelic spectrum of already-identified candidate genes. Increased understanding of the genetic architecture of HDL-C may improve knowledge of pharmaceutically targetable pathways to increase HDL-C and decrease heart disease.

Circulation
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Dense Genotyping of Candidate Gene Loci Identifies Variants Associated With High-Density Lipoprotein Cholesterol

Andrew C. Edmondson, Peter S. Braund, Ioannis M. Stylianou, Amit V. Khera, Christopher P. Nelson, Megan L. Wolfe, Stephanie L. DerOhannessian, Brendan J. Keating, Liming Qu, Jing He, Martin D. Tobin, Maciej Tomaszewski, Jens Baumert, Norman Klopp, Angela Döring, Barbara Thorand, Mingyao Li, Muredach P. Reilly, Wolfgang Koenig, Nilesh J. Samani and Daniel J. Rader

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SUPPLEMENTAL MATERIAL

Supplemental Methods

Subjects

Discovery cohort

The University of Pennsylvania (UPenn) HDL Case-Control study (Penn-CC), is composed of subjects with extreme levels of HDL-C selected from the UPenn High HDL Cholesterol Study (HHDL) and the UPenn Catheterization cohort (PennCATH). HHDL is a cross-sectional study of genetic factors contributing to elevated HDL-C levels. Probands with elevated HDL-C (greater than the 90th percentile for age and gender) were identified by physician referrals or through the Hospital of the UPenn clinical laboratory. Relatives of HHDL probands were also invited to participate in the study. Subjects completed a lifestyle questionnaire and provided a blood sample for the measurement of HDL and other lipid-related traits. The UPenn Institutional Review Board (IRB) approved the study protocol. Over 2000 subjects have been enrolled in the HHDL study to date. PennCATH is composed of consecutive subjects undergoing coronary angiography at UPenn Health System hospitals and has been previously described [1]. Analytical measurements were performed on the UPenn samples as previously described [2]. Plasma HDL-C and triglyceride levels were measured enzymatically on a Cobas Fara II (Roche Diagnostic Systems, Somerville, NJ), using Sigma reagents (Sigma Chemical, St. Louis, MO). In this study, unrelated subjects of European ancestry with HDL > 90th percentile for age and gender were analyzed as cases (n=695) and subjects with HDL < 30th percentile for age and gender were analyzed as controls (n=1038). Subjects with elevated triglycerides (>400 mg/dl), BMI > 40 kg/m^2, diagnosis of diabetes or fasting glucose > 126 mg/dl were excluded from analysis.

Three Replication Cohorts

The UPenn Replication Cohort (Penn-RC), the MONItoring of trends and determinants in CArdiovascular disease/Cooperative Health Research in the Region of Augsburg (MONICA/KORA) Augsburg study, and the Genetic Regulation of Arterial Pressure of Humans in the Community (GRAPHIC) study were used for replication analysis.

Penn-RC is composed of subjects from the UPenn Diabetes Heart Study (PDHS)[3], the Study of Inherited Risk of Coronary Atherosclerosis cohort (SIRCA)[4], the Philadelphia Area Metabolic Syndrome Network (PAMSyN), and a subset of subjects from PennCATH that is non-overlapping with the Penn-CC, which have previously been described. HDL-C measurements were performed as described above. Genotypes and HDL-C were available on up to 2,752 subjects. The UPenn IRB approved the study protocols and informed consent was obtained from all participants.

The MONICA/KORA Augsburg study consists of a series of independent population-based epidemiological surveys of participants living in the region of Augsburg, Southern Germany initially conducted to estimate the prevalence and distribution of cardiovascular risk factors among individuals aged 25 to 74 years as part of the World Health Organization MONICA project[5]. All survey participants were residents of German nationality identified through the registration office. Participants were examined in 1984/85 (S1), 1989/90 (S2) and 1994/95 (S3). Among a source population of 9,531 participants aged 35 to 74 years and with available blood samples a case-cohort design was performed including a stratified random sample of 2,225 participants[6]. All participants underwent standardized examinations including blood withdrawals for plasma and DNA. Genotypes and HDL-C were available on up to 1,544 MONICA/KORA participants of the random sample. HDL-C was measured by enzymatic methods (CHOD-PAP, Boehringer Mannheim, Germany). HDL-C was precipitated with phosphotungstic acid and magnesium ions.

GRAPHIC contains 2,037 white European subjects in 520 nuclear families from the general population. Families were recruited by writing to women aged 40 to 69 registered with participating family practitioners in Leicestershire, UK, inviting them and their family to take part[7]. Families were included if both parents were aged 40 to 60 years and two offspring > 18 years wished to participate. Study subjects had a detailed history taken and were examined by research nurses following standard operating procedures. Non-fasting blood samples were obtained for laboratory analysis. HDL-C was determined using standard enzymatic assays. Genotypes and HDL-C were available for 2020 GRAPHIC subjects. The study was approved by the Leicestershire Research Ethics Committee, and all subjects provided written informed consent.

Genotyping and Quality Control

Genomic DNA was extracted from leukocytes using the EZ1 DNA Blood kit (Qiagen, Valencia, CA) and the BioRobot EZ1 (Qiagen, Valencia, CA). Whole genomic DNA was checked for quality and quantity by UV spectrophotometry using a Spectramax 190 (Molecular Devices, Sunnyvale, CA).

DNA was diluted to 50 ng/ul and genotyping was performed at the Center for Applied Genomics (Children's Hospital of Pennsylvania) following manufacturer specifications for amplification and hybridization to the IBC array (HumanCVD beadchip, Illumina, CA). Penn-CC was genotyped on version 1 of the array, while the Penn-RC was genotyped on version 2. We also performed quality control measures to exclude unreliable SNPs. For the analysis reported here, we eliminated SNPs with genotype call rate < 95%, with minor allele frequency (MAF) < 1% in Penn-RC controls, or if there was a significant departure from Hardy-Weinberg equilibrium ($P < 1 \times 10^{-6}$ in combined cases and controls). Only the 2,415 SNPs within the

candidate gene loci were analyzed. Genotypes for the MONICA/KORA and GRAPHIC replication studies were also obtained using the HumanCVD beadchip (Illumina, CA).

Statistical analyses

For genotype calling a set of 5051 samples from multiple different studies were used to derive a customized cluster file using BeadStudio to ensure accurate genotype calling. The genotype concordance rate was > 99.99% in 22 duplicate sample pairs in Penn-CC. The overall genotype call rate across all samples was 99.6%. Quality control measures were implemented to exclude unreliable samples. First, samples were excluded if the genotype call rate was < 97.5% or if the sample showed excess or deficient heterozygosity (inbreeding coefficient $| F | > 0.1$). Next, identical by descent estimation was used to assess cryptic relatedness or erroneous duplicates among participants. Multi-dimensional scaling (MDS) analysis was also performed to determine subjects that shared similar genetic ancestry (Supplementary Figure 1) using PLINK software[8]. Analysis was limited to subjects of genetically inferred Caucasian ancestry only. The discovery cohort analysis compared genotype frequencies in cases with elevated HDL-C (>90th percentile for age and gender) with frequencies in controls with decreased HDL-C (<30th percentile for age and gender, excluding subjects with absolute HDL-C values <20 mg/dl due to likely monogenic conditions). This analysis was carried out for each SNP and was adjusted for age and gender, with the model assuming additive inheritance. Associations with HDL-C were analyzed using multiple linear regression of HDL-C after adjustment for age and gender. All analyses were conducted using PLINK software [8].

All candidate gene SNPs were tested in the replication cohorts. Each study was analyzed separately. Analysis of association in the GRAPHIC cohort was conducted using generalized estimating equations (GEE) with an exchangeable correlation structure to account

for the shared familial background. The analyses were adjusted for gender, age and age2 (to account for the two generation structure of GRAPHIC population). To summarize the data a meta-analysis was implemented using the METAL software[9]. A *P*-value significance threshold of $< 2.07 \times 10^{-5}$ in the meta-analysis was determined based on the conservative Bonferroni correction (0.05/2415 tests) and a *P*-value of < 0.05 was specified as a suggestive association with HDL-C.

When SNPs reported in published GWAS lipid analyses were not directly genotyped on the IBC array, the bioinformatic tool SNAP [10] was used to identify proxy SNPs on the IBC array with $r^2 > 0.8$.

Conditional analyses were performed incorporating allele dosage of the most significantly associated SNP in each associated locus as a covariate to identify any additional independent SNPs associated with HDL-C. The conditional analysis was performed as a step-wise regression incorporating the highest remaining associated SNP in each associated locus as a covariate until there was no longer any evidence of association with HDL. This was performed using a less stringent cut-off based on the Bonferonni correction for the total number of candidate genes tested ($P < 7.6 \times 10^{-4}$, 0.05/66 genes).

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Supplemental Table 1. HDL candidate genes

Locus	Chromosome	IBC Array Priority	Number of SNPs	Evidence
HDL-associated apolipoproteins				
APOA1/APOA4/APOA5/APOC3	11q23-q24	1	62	biology[11, 12], mouse[13-16], human[14, 17-20], GWAS[21-24]
APOA2	1q21-q23	1	18	biology[11, 25], mouse[26-28], human[20]
APOD	3q29	1	13	biology[11]
APOF	12q13.3	2	10	biology[11, 29], mouse[30]
APOE/APOC1/APOC2	19q13.32	1	57	biology[11], mouse[31], human[19, 20], GWAS[23, 24]
HDL-associated enzymes				
CETP	16q13	1	97	biology[11, 32], mouse[33], human[19, 20], GWAS[9, 21-24, 34-37]
LCAT	16q22.1	1	15	biology[11], mouse[38-41], human[14, 18-20, 42], GWAS[22, 24, 37]
PAFAH1B1	17p13.3	2	13	biology[11]
PAFAH1B2	11q23.3	1	8	biology[11]
PAFAH1B3	19q13.2	2	5	biology[11]
PLTP	20q13.12	1	31	biology[11], mouse[43-45], GWAS[22-24]
PON1/PON2/PON3/PON4	7q21.3	1	165	biology[11], human[19, 20]
Plasma and cell-associated enzymes				
ACSM1	16p12.3	2	13	human[46]
ACSM2	16p13.11	2	12	human[46]
DGAT1	8q24.3	1	7	human[19, 47]
FURIN	15q26.1	1	13	biology[48, 49]
HSP90B1	12q24.2	2	18	biology[50]
LIPC	15q21.3	1	177	biology[51], mouse[52, 53], human[19, 20, 54], GWAS[9, 21-24, 34, 36, 37]
LIPE	19q13.2	1	43	biology[55], mouse[56]
LIPG	18q21.1	1	42	biology[57], mouse[58-61], human[19, 20, 62, 63], GWAS[9, 21-24, 34, 35]
LPL	8p21.3	1	75	biology[64], mouse[65], human[14, 18-20], GWAS[9, 21-24, 34, 35]

PCSK5	9q21.3	2	178	biology[48, 49]
PCSK6	15q26.3	1	224	biology[48, 49]
PEMT	17p11.2	2	26	mouse[66]
SOAT1	1q25.2	1	30	biology
SOAT2	12q13.13	1	24	mouse[67]

Cell receptors and transporters

ABCA1	9q22-q31	1	141	biology[68], mouse[69], human[14, 18-20, 70], GWAS[9, 21-24, 34]
ABCA7	19p13.3	1	12	biology[71], mouse[72]
ABCB11	2q24	2	53	biology
ABCB4	7q21.1	2	20	biology
ABCD1	14q32.3	2	7	biology
ABCG1	21q22.3	1	69	biology[68, 73], mouse[74, 75]
ABCG4	11q23.3	1	12	biology[73]
ABCG5	2p21	1	35	mouse[76, 77], human[20, 76], GWAS
ABCG8	2p21	2	22	mouse[76, 77], human[20, 76], GWAS
ATP5B	12q13.13	2	7	biology[78]
CAV1/CAV2	7q31.1	1	29	biology[79], mouse[80]
CD36	7q11.2	1	118	biology, human[19]
CUBN	10p12.31	2	150	biology[81, 82]
FAS	10q24.1	1	89	mouse[83]
GPR109A/GPR109B/GPR81	12q24.31	1	30	biology[84]
HDLBP	2q37	1	43	biology[50, 85]
LRP1	12q13-q14	1	96	biology
LRP2	2q24-q31	2	102	biology[82]
P2RY13/PSRY14	3q24	1	11	biology[86]
PDZK1	1q21	1	9	biology[87], mouse[88]
PDZK1IP1	1p33	2	12	mouse[89]
NR5A2	1q32.1	2	65	biology
SCARB1	12q24.31	1	74	biology[90], mouse[91, 92], human[19, 20], GWAS[24]

Transcription Factors

NFKB1	4q24	1	122	mouse[93]
NR1H2 (LXRB)	19q13.3	1	12	biology, human[19]
NR1H3 (LXRA)	11p11.2	1	7	GWAS[37]
PPARA	22q12-q13.1; 22q13.31	1	104	mouse[94], human[19]
PPARD	6p21.2-p21.1	1	93	biology
PPARG	3p25	1	101	biology
RXRA	9q34.3	1	133	biology
RXRB	6p21.3	2	5	biology
TCF1	12q24.2	2	13	mouse[95], human[96]

GWAS validated locus

ANGPTL3	1p31.1-p22.3	1	9	biology[49]
ANGPTL4	19p13.3	1	7	GWAS[22, 24]
APOB	2p24	1	107	GWAS[20, 24, 34]
FADS1/FADS2/FADS3	11q12-q13.1	1	30	GWAS[22, 24]
GALNT2	1q41-q42	0	2	GWAS[9, 21, 22, 24]
HNF4A	20q12-q13.1	1	67	mouse[97], GWAS[22, 24]
MMAB/MVK	12q24	2	10	GWAS[9, 22, 24]
TRIB1	8q24.13	0	4	GWAS[24]

Supplemental Table 2. Penn-CC Discovery Cohort SNPs with Suggestive Evidence of Association

					Penn-CC			Penn-RC			MONICA/KORA			GRAPHIC			Combined Replication Cohort		
Locus	SNP	A1	A2	MAF	T	P	N	T	P	N	T	P	N	Z	P	N	Z	P	N
CETP	rs1800775	A	C	0.45	7.70	1.45E-16	1600	5.63	2.04E-08	2693	5.82	7.14E-09	1536	6.57	4.95E-11	2020	10.29	7.99E-25	6249
CETP	rs17231506	A	G	0.28	7.57	1.89E-16	1600	6.25	4.68E-10	2691	6.84	1.12E-11	1536	7.83	5.00E-15	2020	11.91	1.10E-32	6247
CETP	rs3764261	A	C	0.28	7.47	3.55E-16	1600	6.15	8.94E-10	2693	6.93	6.36E-12	1542	7.83	4.77E-15	2019	11.88	1.45E-32	6254
CETP	rs711752	A	G	0.38	7.75	5.35E-16	1600	4.23	2.44E-05	2693	5.84	6.25E-09	1539	6.69	2.30E-11	2019	9.45	3.30E-21	6251
CETP	rs708272	A	G	0.38	7.75	5.35E-16	1600	4.23	2.44E-05	2693	5.84	6.28E-09	1540	6.67	2.52E-11	2020	9.45	3.55E-21	6253
CETP	rs1864163	A	G	0.30	-7.68	1.19E-15	1598	-4.68	3.05E-06	2692	-6.37	2.48E-10	1541	-5.68	1.32E-08	2020	-9.43	3.93E-21	6253
CETP	rs11076175	G	A	0.22	-7.81	2.07E-15	1597	-5.62	2.10E-08	2692	-5.05	5.07E-07	1538	-5.06	4.26E-07	2018	-9.05	1.50E-19	6248
CETP	rs7499892	A	G	0.22	-7.77	3.50E-15	1600	-5.73	1.10E-08	2693	-5.21	2.18E-07	1542	-5.17	2.36E-07	2018	-9.26	2.04E-20	6253
CETP	rs11508026	A	G	0.39	7.46	3.95E-15	1600	4.07	4.93E-05	2690	5.76	1.00E-08	1534	6.61	3.80E-11	2020	9.27	1.95E-20	6244
CETP	rs1532624	A	C	0.39	7.35	5.12E-15	1600	4.13	3.68E-05	2693	6.17	8.81E-10	1543	7.01	2.43E-12	2020	9.73	2.17E-22	6256
CETP	rs1532625	A	G	0.39	7.36	6.89E-15	1549	4.14	3.65E-05	2605	5.90	4.38E-09	1506	7.14	9.45E-13	2017	9.70	3.11E-22	6128
CETP	rs12720922	A	G	0.22	-7.52	1.55E-14	1600	-5.76	9.57E-09	2693	-5.36	9.56E-08	1540	-5.25	1.50E-07	2019	-9.40	5.53E-21	6252
CETP	rs7203984	C	A	0.23	-7.52	3.64E-14	1600	-5.48	4.74E-08	2693	-4.90	1.08E-06	1539	-4.73	2.25E-06	2019	-8.69	3.56E-18	6251
CETP	rs9939224	A	C	0.25	-7.40	1.74E-13	1600	-5.66	1.65E-08	2693	-4.94	8.66E-07	1541	-3.97	7.27E-05	2020	-8.40	4.42E-17	6254
CETP	rs11076176	C	A	0.21	-6.33	4.90E-10	1599	-4.68	2.98E-06	2692	-4.74	2.34E-06	1537	-5.08	3.79E-07	2019	-8.30	1.08E-16	6248
CETP	rs289714	G	A	0.21	-6.28	9.94E-10	1600	-4.71	2.57E-06	2693	-4.12	3.92E-05	1540	-4.72	2.35E-06	2019	-7.81	5.74E-15	6252
CETP	rs4783961	A	G	0.48	4.52	5.07E-07	1600	3.76	1.72E-04	2691	2.78	5.44E-03	1537	3.43	6.03E-04	2020	5.80	6.85E-09	6248
LPL	rs3208305	T	A	0.27	4.87	6.33E-07	1593	3.19	1.42E-03	2675	2.27	2.31E-02	1530	2.99	2.77E-03	2019	4.92	8.55E-07	6224

LPL	rs13702	G	A	0.28	4.85	7.37E-07	1599	3.16	1.58E-03	2693	2.26	2.43E-02	1543	3.01	2.62E-03	2020	4.90	9.52E-07	6256
CETP	rs12720889	A	T	0.28	4.68	1.17E-06	1596	-0.12	9.01E-01	2683	2.42	1.58E-02	1486	2.85	4.40E-03	2017	2.73	6.39E-03	6186
CETP	rs289743	G	A	0.28	4.47	2.58E-06	1585	-0.46	6.43E-01	2593	3.12	1.84E-03	1519	3.05	2.33E-03	2016	3.00	2.73E-03	6128
CETP	rs289718	G	A	0.29	4.40	3.25E-06	1598	-0.19	8.50E-01	2689	2.88	4.01E-03	1536	2.93	3.38E-03	2017	2.97	2.98E-03	6242
CETP	rs289719	A	G	0.29	4.38	3.66E-06	1599	-0.26	7.95E-01	2693	2.95	3.22E-03	1539	2.93	3.42E-03	2018	2.95	3.13E-03	6250
CETP	rs289716	T	A	0.29	4.32	5.16E-06	1600	-0.27	7.86E-01	2693	2.67	7.70E-03	1537	2.85	4.40E-03	2020	2.76	5.73E-03	6250
LPL	rs263	A	G	0.17	4.25	7.68E-06	1600	3.15	1.67E-03	2693	2.67	7.62E-03	1541	3.01	2.62E-03	2020	5.10	3.45E-07	6254
CETP	rs6499863	A	G	0.18	-4.37	9.05E-06	1600	-0.81	4.16E-01	2693	-3.00	2.74E-03	1542	-1.55	1.21E-01	2020	-2.90	3.72E-03	6255
LIPG	rs2156552	A	T	0.18	-4.07	1.43E-05	1600	-2.30	2.16E-02	2693	-0.95	3.40E-01	1543	-3.37	7.48E-04	2020	-3.90	9.76E-05	6256
LPL	rs328	G	C	0.08	4.27	1.45E-05	1600	3.20	1.42E-03	2693	2.91	3.62E-03	1544	3.14	1.68E-03	2020	5.32	1.02E-07	6257
LIPG	rs1943981	T	A	0.18	-4.10	1.50E-05	1600	-2.32	2.04E-02	2693	-0.87	3.86E-01	1544	-3.37	7.63E-04	2020	-3.86	1.12E-04	6257
CETP	rs5882	G	A	0.30	4.11	1.59E-05	1600	0.09	9.24E-01	2693	2.94	3.36E-03	1543	3.10	1.95E-03	2019	3.28	1.04E-03	6255
CETP	rs11076174	G	A	0.11	-4.49	1.88E-05	1600	-2.37	1.80E-02	2693	-1.46	1.44E-01	1543	0.35	7.30E-01	2020	-2.08	3.74E-02	6256
LPL	rs301	G	A	0.21	4.27	2.54E-05	1597	3.67	2.43E-04	2693	1.26	2.07E-01	1541	3.06	2.21E-03	2019	4.77	1.81E-06	6253
CETP	rs4784745	G	A	0.35	-3.74	2.68E-05	1600	-0.16	8.76E-01	2693	-2.13	3.36E-02	1544	-5.09	3.53E-07	2019	-4.05	5.11E-05	6256
LPL	rs12679834	G	A	0.08	4.15	2.71E-05	1598	3.12	1.83E-03	2691	3.08	2.10E-03	1538	3.22	1.28E-03	2013	5.40	6.61E-08	6242
CETP	rs6499861	G	C	0.17	-4.11	3.39E-05	1600	-0.58	5.64E-01	2693	-2.81	4.99E-03	1543	-1.73	8.43E-02	2020	-2.75	5.89E-03	6256
LPL	rs268	G	A	0.02	-3.48	4.83E-05	1600	-1.69	9.17E-02	2693	-3.95	8.30E-05	1543	-0.49	6.23E-01	2019	-3.34	8.36E-04	6255
RXRA	rs35738419	A	G	0.02	-3.30	4.88E-05	1573	-0.19	8.52E-01	2564	-0.57	5.69E-01	1499	-19.41	0.00E+00	2020	-0.50	6.21E-01	4063
GPR109A/B/81	rs2256572	A	G	0.45	-4.19	5.44E-05	1597	-0.79	4.31E-01	2690	1.75	7.97E-02	1531	-0.16	8.72E-01	2020	0.26	7.96E-01	6241
CETP	rs5883	A	G	0.05	3.92	6.00E-05	1600	2.49	1.29E-02	2693	-0.70	4.87E-01	1531	1.02	3.07E-01	2019	1.87	6.14E-02	6243

GPR109A/B/81	rs1798192	A	C	0.45	-4.16	6.18E-05	1594	-0.79	4.29E-01	2685	1.83	6.79E-02	1527	-0.20	8.42E-01	2016	0.27	7.86E-01	6228
GPR109A/B/81	rs3858543	A	G	0.39	-4.06	6.97E-05	1594	-0.04	9.71E-01	2687	1.13	2.57E-01	1524	-0.23	8.19E-01	2018	-0.41	6.84E-01	6229
LPL	rs3735964	A	C	0.09	3.97	7.00E-05	1600	2.97	3.02E-03	2693	2.09	3.69E-02	1543	3.34	8.40E-04	2019	4.88	1.06E-06	6255
LPL	rs3779788	A	G	0.13	4.03	7.34E-05	1600	2.78	5.45E-03	2693	2.91	3.65E-03	1543	2.83	4.67E-03	2020	4.88	1.09E-06	6256
CETP	rs289717	A	G	0.35	-3.48	7.40E-05	1600	-0.02	9.88E-01	2693	-1.94	5.21E-02	1537	-4.92	8.69E-07	2020	-3.77	1.63E-04	6250
CETP	rs4784744	A	G	0.35	-3.44	8.48E-05	1600	-0.10	9.20E-01	2693	-2.10	3.60E-02	1544	-5.11	3.25E-07	2020	-4.01	6.08E-05	6257
CETP	rs291044	A	G	0.35	-3.37	1.15E-04	1600	-0.08	9.39E-01	2693	-1.91	5.64E-02	1542	-5.02	5.25E-07	2020	-3.85	1.19E-04	6255
SCARB1	rs10773105	G	A	0.47	3.92	1.24E-04	1599	0.67	5.02E-01	2693	-0.45	6.52E-01	1534	0.93	3.54E-01	2020	0.75	4.56E-01	6247
SCARB1	rs865716	A	T	0.48	3.90	1.59E-04	1600	0.90	3.67E-01	2688	0.79	4.32E-01	1531	0.36	7.20E-01	2020	1.19	2.36E-01	6239
LPL	rs3916027	A	G	0.24	3.79	1.94E-04	1596	3.26	1.13E-03	2692	2.03	4.30E-02	1533	3.32	9.11E-04	2012	5.03	4.99E-07	6237
LPL	rs264	A	G	0.13	3.57	2.28E-04	1599	3.54	4.13E-04	2691	2.73	6.39E-03	1543	3.63	2.87E-04	2019	5.73	9.89E-09	6253
LPL	rs331	A	G	0.24	3.70	2.94E-04	1600	3.28	1.04E-03	2693	2.01	4.48E-02	1539	3.41	6.45E-04	2020	5.09	3.64E-07	6252
LPL	rs256	A	G	0.13	3.49	2.98E-04	1600	3.32	8.98E-04	2693	2.88	3.99E-03	1543	3.63	2.82E-04	2020	5.67	1.41E-08	6256
FADS1/2/3	rs174577	A	C	0.38	-3.61	3.27E-04	1520	-2.36	1.85E-02	2633	-1.05	2.92E-01	1364	-2.76	5.78E-03	2020	-3.66	2.54E-04	6017
CETP	rs9923854	C	A	0.09	3.54	3.49E-04	1600	1.52	1.28E-01	2692	-1.21	2.26E-01	1540	-0.02	9.81E-01	2019	-0.39	7.00E-01	6251
PCSK5	rs7031971	G	A	0.45	-3.50	3.77E-04	1600	-2.21	2.71E-02	2693	0.03	9.76E-01	1544	-0.07	9.47E-01	2019	-1.47	1.41E-01	6256
APOE/C1/C2	rs12721046	A	G	0.16	-3.65	4.78E-04	1597	-3.65	2.63E-04	2676	-1.36	1.75E-01	1522	-1.28	2.00E-01	2019	-3.80	1.48E-04	6217
CETP	rs12708967	G	A	0.21	-3.42	4.86E-04	1600	-2.63	8.60E-03	2687	-4.42	1.07E-05	1544	-5.02	5.19E-07	2019	-6.76	1.35E-11	6250
CETP	rs12597002	A	C	0.31	-2.87	4.94E-04	1600	-1.34	1.80E-01	2693	-1.69	9.18E-02	1544	-3.49	4.80E-04	2020	-3.70	2.15E-04	6257
CUBN	rs17139747	G	A	0.04	-3.33	5.16E-04	1600	0.36	7.20E-01	2693	1.57	1.16E-01	1544	-1.14	2.53E-01	2020	0.37	7.13E-01	6257
LRP2	rs2673162	A	G	0.05	3.14	5.25E-04	1599	-0.57	5.67E-01	2693	-1.53	1.27E-01	1544	1.37	1.72E-01	2020	-0.36	7.22E-01	6257

CETP	rs1801706	A	G	0.17	3.36	5.80E-04	1600	-0.50	6.20E-01	2693	0.67	5.06E-01	1544	1.32	1.87E-01	2019	0.76	4.50E-01	6256
SCARB1	rs12819677	A	G	0.48	-3.45	5.91E-04	1600	-0.99	3.22E-01	2693	0.93	3.51E-01	1538	-0.85	3.96E-01	2019	-0.67	5.03E-01	6250
LPL	rs271	A	G	0.14	3.28	6.86E-04	1600	2.99	2.83E-03	2693	2.29	2.21E-02	1541	3.36	7.88E-04	2018	5.00	5.63E-07	6252
LPL	rs320	C	A	0.26	3.44	7.94E-04	1596	3.41	6.67E-04	2690	1.63	1.03E-01	1530	3.18	1.49E-03	2019	4.85	1.24E-06	6239
ABCA1	rs10991405	C	G	0.07	3.15	8.04E-04	1600	-1.33	1.84E-01	2693	0.02	9.84E-01	1544	-1.56	1.19E-01	2020	-1.75	8.02E-02	6257
ABCA1	rs12336969	A	C	0.07	3.15	8.04E-04	1600	-1.31	1.91E-01	2693	0.02	9.84E-01	1544	-1.43	1.52E-01	2020	-1.66	9.68E-02	6257
APOB	rs676210	A	G	0.20	3.07	9.21E-04	1600	0.76	4.47E-01	2693	1.73	8.37E-02	1543	0.98	3.26E-01	2020	1.92	5.53E-02	6256
LPL	rs255	G	A	0.14	3.21	9.35E-04	1600	3.42	6.48E-04	2693	2.10	3.57E-02	1542	3.27	1.06E-03	2020	5.14	2.73E-07	6255
ABCA1	rs12341993	A	C	0.14	-3.22	9.49E-04	1600	-0.08	9.37E-01	2693	-0.94	3.48E-01	1543	-1.31	1.91E-01	2020	-1.26	2.07E-01	6256
APOB	rs673548	A	G	0.20	3.04	9.68E-04	1599	0.78	4.35E-01	2693	1.72	8.61E-02	1544	1.00	3.19E-01	2020	1.93	5.34E-02	6257
FADS1/2/3	rs174601	A	G	0.38	-3.35	1.05E-03	1599	-2.12	3.44E-02	2689	-0.80	4.26E-01	1543	-2.68	7.34E-03	2020	-3.31	9.43E-04	6252
NFKB1	rs230510	A	T	0.47	-3.12	1.07E-03	1599	0.01	9.91E-01	2693	-0.15	8.84E-01	1543	-0.51	6.10E-01	2018	-0.35	7.23E-01	6254
ABCA1	rs10991412	A	G	0.06	3.06	1.09E-03	1600	-1.31	1.91E-01	2693	0.19	8.48E-01	1544	-1.31	1.92E-01	2020	-1.51	1.32E-01	6257
NFKB1	rs1585214	A	G	0.47	-3.12	1.16E-03	1600	0.11	9.09E-01	2693	-0.19	8.53E-01	1542	-0.57	5.69E-01	2018	-0.34	7.33E-01	6253
ABCA1	rs4100654	G	A	0.11	-3.04	1.17E-03	1599	-0.93	3.52E-01	2692	-2.04	4.13E-02	1543	-0.83	4.08E-01	2020	-2.10	3.62E-02	6255
LPL	rs327	C	A	0.26	3.24	1.18E-03	1599	3.49	4.94E-04	2681	1.69	9.22E-02	1525	3.25	1.16E-03	2020	4.97	6.70E-07	6226
CETP	rs708273	A	G	0.30	-2.60	1.29E-03	1599	-1.40	1.63E-01	2693	-1.34	1.79E-01	1394	-3.52	4.24E-04	2019	-3.60	3.24E-04	6106
NFKB1	rs1598856	A	G	0.48	-3.05	1.44E-03	1600	0.04	9.65E-01	2693	-0.01	9.94E-01	1544	-0.64	5.21E-01	2020	-0.34	7.34E-01	6257
CETP	rs1800777	A	G	0.04	-2.92	1.50E-03	1599	-3.65	2.68E-04	2692	-4.28	2.00E-05	1541	-2.38	1.74E-02	2020	-5.86	4.62E-09	6253
LPL	rs1534649	A	C	0.38	3.31	1.51E-03	1594	1.33	1.83E-01	2578	1.16	2.48E-01	1532	1.63	1.03E-01	2019	2.38	1.75E-02	6129
PON1/2/3/4	rs17884000	G	A	0.21	-3.30	1.52E-03	1595	-1.03	3.03E-01	2669	1.32	1.89E-01	1505	0.65	5.13E-01	2016	-0.35	7.30E-01	6190

FADS1/2/3	rs1535	G	A	0.35	-3.21	1.57E-03	1600	-2.78	5.41E-03	2693	-0.81	4.18E-01	1537	-2.92	3.49E-03	2020	-3.89	1.01E-04	6250
APOB	rs2678379	A	G	0.20	2.89	1.62E-03	1600	0.70	4.86E-01	2693	1.70	8.99E-02	1544	1.03	3.04E-01	2020	1.88	5.96E-02	6257
SORCS1	rs7897974	A	G	0.47	2.80	1.68E-03	1600	0.79	4.31E-01	2691	1.13	2.60E-01	1542	-0.13	8.93E-01	2020	1.15	2.49E-01	6253
LPL	rs329	G	A	0.03	2.82	1.71E-03	1600	0.01	9.90E-01	2693	0.87	3.83E-01	1544	-0.55	5.80E-01	2019	-0.13	8.99E-01	6256
LPL	rs28445964	G	A	0.02	-2.82	1.78E-03	1600	-1.51	1.32E-01	2693	-1.03	3.04E-01	1543	-2.18	2.94E-02	2020	-2.74	6.22E-03	6256
PON1/2/3/4	rs2299267	G	A	0.19	-3.26	1.91E-03	1600	-2.01	4.46E-02	2693	1.40	1.60E-01	1543	0.21	8.34E-01	2020	-0.50	6.16E-01	6256
LPL	rs343	A	C	0.08	3.18	1.92E-03	1595	2.19	2.90E-02	2683	1.58	1.14E-01	1538	2.54	1.11E-02	2019	3.66	2.52E-04	6240
LPL	rs10104051	A	G	0.37	3.20	2.20E-03	1598	1.44	1.51E-01	2689	1.65	9.91E-02	1540	1.80	7.11E-02	2020	2.79	5.32E-03	6249
LPL	rs7009128	G	A	0.02	-2.73	2.36E-03	1600	-1.83	6.68E-02	2693	-1.01	3.13E-01	1543	-2.24	2.49E-02	2020	-2.98	2.89E-03	6256
LPL	rs28645722	A	G	0.02	-2.73	2.36E-03	1600	-1.45	1.47E-01	2693	-1.28	2.01E-01	1504	-2.24	2.52E-02	2019	-2.86	4.25E-03	6216
LPL	rs1470186	G	A	0.02	-2.73	2.36E-03	1600	-1.65	9.82E-02	2693	-1.01	3.11E-01	1544	-2.18	2.96E-02	2019	-2.82	4.74E-03	6256
LPL	rs6999612	G	A	0.02	-2.74	2.36E-03	1600	-1.40	1.63E-01	2693	-1.32	1.86E-01	1543	-2.18	2.94E-02	2020	-2.81	4.94E-03	6256
LPL	rs17091742	A	G	0.02	-2.73	2.36E-03	1600	-1.60	1.11E-01	2693	-1.03	3.02E-01	1544	-2.17	2.96E-02	2020	-2.80	5.19E-03	6257
LPL	rs28615996	G	A	0.02	-2.73	2.36E-03	1600	-1.53	1.26E-01	2693	-1.03	3.02E-01	1544	-2.18	2.94E-02	2020	-2.76	5.87E-03	6257
LPL	rs7000460	C	A	0.02	-2.73	2.36E-03	1600	-1.45	1.47E-01	2693	-1.01	3.13E-01	1542	-2.18	2.94E-02	2019	-2.69	7.15E-03	6254
LIPC	rs11635491	A	G	0.25	2.72	2.69E-03	1596	1.43	1.53E-01	2688	2.83	4.73E-03	1524	2.22	2.67E-02	2011	3.60	3.23E-04	6223
APOB	rs1042034	G	A	0.20	2.72	2.90E-03	1600	0.74	4.61E-01	2692	1.73	8.43E-02	1542	0.95	3.40E-01	2020	1.88	5.97E-02	6254
LPL	rs28575919	C	G	0.02	-2.67	3.12E-03	1600	-1.59	1.12E-01	2693	-1.17	2.43E-01	1544	-2.18	2.94E-02	2020	-2.86	4.25E-03	6257
LPL	rs7016529	G	A	0.02	-2.67	3.12E-03	1600	-1.59	1.12E-01	2693	-1.01	3.13E-01	1543	-2.18	2.94E-02	2020	-2.78	5.43E-03	6256
PON1/2/3/4	rs10259688	G	A	0.18	-3.16	3.28E-03	1599	-0.86	3.90E-01	2693	1.67	9.55E-02	1544	0.92	3.59E-01	2018	0.79	4.32E-01	6255
APOB	rs1801695	A	G	0.03	2.87	3.39E-03	1600	2.72	6.59E-03	2693	0.50	6.14E-01	1544	1.65	9.80E-02	2020	2.97	2.95E-03	6257

LIPC	rs4774297	C	A	0.44	2.57	3.41E-03	1600	1.47	1.43E-01	2693	0.57	5.66E-01	1539	1.78	7.51E-02	2020	2.26	2.39E-02	6252
FADS1/2/3	rs174576	A	C	0.35	-2.99	3.61E-03	1600	-2.44	1.48E-02	2693	-0.59	5.58E-01	1544	-2.76	5.78E-03	2020	-3.46	5.45E-04	6257
CETP	rs9930761	G	A	0.06	2.85	3.76E-03	1600	1.68	9.34E-02	2693	-0.49	6.25E-01	1539	-0.42	6.77E-01	2018	0.62	5.34E-01	6250
LIPC	rs8035006	A	T	0.31	2.68	3.78E-03	1600	0.03	9.78E-01	2693	2.17	3.02E-02	1544	-1.48	1.39E-01	2019	0.25	8.00E-01	6256
NFKB1	rs17033015	A	C	0.45	-2.78	4.12E-03	1557	-0.65	5.14E-01	2654	-0.52	6.04E-01	1167	-0.23	8.16E-01	2018	-0.81	4.18E-01	5839
LIPC	rs572410	C	G	0.22	2.92	4.14E-03	1600	1.12	2.62E-01	2693	1.43	1.52E-01	1542	1.06	2.88E-01	2020	2.05	4.02E-02	6255
PLTP	rs6073950	T	A	0.34	2.53	4.29E-03	1553	2.06	3.91E-02	2529	-0.60	5.51E-01	1416	0.29	7.68E-01	1995	1.23	2.20E-01	5940
ABCA1	rs3780543	G	A	0.12	2.59	4.55E-03	1600	1.49	1.36E-01	2683	1.32	1.87E-01	1526	0.02	9.84E-01	2019	1.64	1.00E-01	6228
NFKB1	rs3774968	A	G	0.46	-2.72	4.76E-03	1600	-0.09	9.31E-01	2693	-0.23	8.22E-01	1542	-0.69	4.89E-01	2019	-0.56	5.75E-01	6254
FADS1/2/3	rs2072114	G	A	0.14	-2.87	4.89E-03	1600	-1.79	7.36E-02	2693	-1.37	1.70E-01	1537	-2.09	3.67E-02	2020	-3.04	2.35E-03	6250
CETP	rs736274	T	A	0.10	2.65	4.92E-03	1600	0.01	9.94E-01	2691	2.83	4.68E-03	1542	2.88	4.04E-03	2020	3.04	2.34E-03	6253
ABCG8	rs17606027	G	A	0.13	2.67	4.96E-03	1600	0.25	8.03E-01	2693	-0.90	3.70E-01	1542	-0.30	7.60E-01	2020	-0.46	6.49E-01	6255
SCARB1	rs4765180	A	G	0.44	2.53	5.04E-03	1596	1.27	2.05E-01	2691	0.80	4.25E-01	1541	0.26	7.93E-01	2015	1.38	1.69E-01	6247
PCSK5	rs10869668	G	C	0.22	-2.88	5.05E-03	1596	-0.59	5.53E-01	2688	0.17	8.64E-01	1540	0.39	6.96E-01	2016	-0.08	9.35E-01	6244
FADS1/2/3	rs174548	C	G	0.31	-2.91	5.28E-03	1600	-1.86	6.32E-02	2692	0.01	9.92E-01	1542	-2.92	3.50E-03	2019	-2.87	4.07E-03	6253
FADS1/2/3	rs174570	A	G	0.14	-2.95	5.35E-03	1600	-2.92	3.52E-03	2693	-2.65	8.16E-03	1543	-1.41	1.58E-01	2020	-4.03	5.55E-05	6256
LIPC	rs8033940	A	G	0.28	2.51	5.65E-03	1598	1.43	1.53E-01	2690	3.61	3.20E-04	1543	2.16	3.11E-02	2020	3.95	7.80E-05	6253
NFKB1	rs7674640	G	A	0.51	-2.57	5.68E-03	1571	0.71	4.77E-01	2582	-1.05	2.93E-01	1462	-0.36	7.16E-01	2013	-0.26	7.93E-01	6057
CUBN	rs12411446	G	A	0.04	-2.72	5.68E-03	1600	0.04	9.70E-01	2693	0.92	3.57E-01	1543	-1.35	1.77E-01	2018	-0.28	7.76E-01	6254
CETP	rs5880	C	G	0.05	-2.53	5.78E-03	1600	-4.15	3.50E-05	2693	-4.18	3.04E-05	1544	-2.22	2.67E-02	2020	-6.05	1.49E-09	6257
LRP1	rs1799986	A	G	0.14	2.50	5.81E-03	1600	1.85	6.52E-02	2685	-0.81	4.16E-01	1540	-0.63	5.30E-01	2019	0.45	6.54E-01	6244

PON1/2/3/4	rs17884563	T	A	0.11	-3.10	5.81E-03	1600	-0.89	3.73E-01	2670	-0.30	7.66E-01	1544	1.12	2.61E-01	2020	0.09	9.27E-01	6234
ABCA1	rs12235875	G	A	0.05	2.48	5.86E-03	1600	0.56	5.72E-01	2682	0.90	3.67E-01	1537	1.40	1.61E-01	2019	1.62	1.06E-01	6238
RXRA	rs35123561	A	G	0.08	-2.69	5.86E-03	1600	-0.25	8.01E-01	2693	0.02	9.86E-01	1544	0.67	5.03E-01	2020	0.23	8.22E-01	6257
LIPC	rs8034802	A	T	0.27	2.51	5.94E-03	1599	1.20	2.30E-01	2692	3.33	8.78E-04	1541	2.31	2.07E-02	2017	3.75	1.74E-04	6250
LPL	rs1800590	C	A	0.03	-2.44	5.97E-03	1600	-0.83	4.04E-01	2692	-1.31	1.92E-01	1544	-2.25	2.47E-02	2019	-2.47	1.34E-02	6255
LPL	rs1031045	A	G	0.03	-2.44	5.97E-03	1600	-0.59	5.56E-01	2693	-1.25	2.11E-01	1544	-2.18	2.94E-02	2020	-2.25	2.48E-02	6257
LIPG	rs12966382	A	G	0.14	2.59	6.04E-03	1600	0.11	9.09E-01	2693	0.06	9.49E-01	1542	2.41	1.59E-02	2018	1.48	1.40E-01	6253
CETP	rs12720918	G	A	0.30	-2.64	6.13E-03	1599	-3.56	3.74E-04	2693	-3.77	1.69E-04	1543	-4.68	2.86E-06	2020	-6.86	6.81E-12	6256
APOA1/A4/A5/C3	rs12285095	C	A	0.08	-2.85	7.15E-03	1600	-2.04	4.14E-02	2693	-1.42	1.56E-01	1544	-1.61	1.08E-01	2020	-2.96	3.10E-03	6257
PLTP	rs6065904	A	G	0.22	-2.33	7.21E-03	1599	-0.29	7.72E-01	2693	0.14	8.90E-01	1542	-1.88	5.97E-02	2020	-1.19	2.33E-01	6255
FADS1/2/3	rs2524299	T	A	0.13	-2.74	7.34E-03	1598	-1.29	1.98E-01	2691	-1.40	1.61E-01	1542	-2.03	4.24E-02	2019	-2.69	7.07E-03	6252
FADS1/2/3	rs174535	G	A	0.35	-2.76	7.38E-03	1598	-2.33	2.01E-02	2693	-0.92	3.56E-01	1542	-3.00	2.73E-03	2020	-3.69	2.28E-04	6255
SOAT1	rs2255375	G	A	0.16	2.88	7.39E-03	1600	1.25	2.12E-01	2693	0.16	8.74E-01	1543	-0.76	4.46E-01	2020	0.47	6.42E-01	6256
NFKB1	rs230528	C	A	0.36	2.57	7.70E-03	1573	1.38	1.66E-01	2664	0.26	7.94E-01	1417	1.91	5.62E-02	2018	2.14	3.25E-02	6099
CETP	rs289742	C	G	0.11	2.48	7.77E-03	1600	0.13	9.01E-01	2692	3.44	5.93E-04	1543	2.74	6.05E-03	2020	3.35	8.15E-04	6255
APOA1/A4/A5/C3	rs12287066	A	C	0.08	-2.81	8.34E-03	1600	-2.05	4.03E-02	2691	-1.61	1.07E-01	1540	-1.65	9.89E-02	2019	-3.08	2.04E-03	6250
CUBN	rs12416115	G	A	0.04	-2.59	8.45E-03	1600	0.26	7.95E-01	2693	0.92	3.57E-01	1543	-1.44	1.49E-01	2018	-0.19	8.49E-01	6254
ABCA1	rs1883025	A	G	0.29	-2.45	8.51E-03	1599	-1.37	1.71E-01	2693	-0.85	3.94E-01	1544	-2.62	8.86E-03	2020	-2.81	4.98E-03	6257
LIPC	rs4775065	A	G	0.23	2.36	8.55E-03	1600	-0.39	7.00E-01	2692	-1.03	3.04E-01	1543	1.57	1.17E-01	2019	0.13	8.99E-01	6254
PLTP	rs4810479	G	A	0.26	-2.14	8.64E-03	1599	-0.16	8.73E-01	2693	0.47	6.39E-01	1543	-2.48	1.33E-02	2018	-1.28	2.01E-01	6254
SCARB1	rs4379922	G	A	0.34	2.41	8.96E-03	1600	1.62	1.06E-01	2693	1.20	2.31E-01	1543	0.31	7.54E-01	2019	1.83	6.66E-02	6255

PDZK1IP1	rs12760654	A	G	0.22	-2.47	9.23E-03	1600	-0.57	5.70E-01	2693	0.35	7.27E-01	1539	-0.25	7.99E-01	2019	-0.34	7.31E-01	6251
CETP	rs12447924	G	A	0.24	-2.13	9.24E-03	1597	-2.25	2.48E-02	2684	-0.72	4.69E-01	1538	-2.78	5.39E-03	2020	-3.42	6.39E-04	6242
PON1/2/3/4	rs17880030	A	G	0.20	-2.67	9.27E-03	1599	-0.42	6.73E-01	2689	1.29	1.99E-01	1542	0.89	3.74E-01	2020	0.87	3.87E-01	6251
NFKB1	rs3774964	G	A	0.33	2.62	9.38E-03	1600	2.03	4.30E-02	2693	-0.06	9.55E-01	1539	2.05	4.00E-02	2020	2.47	1.36E-02	6252
LIPC	rs1869144	G	A	0.37	2.34	9.48E-03	1600	-0.08	9.33E-01	2693	-0.54	5.91E-01	1541	0.29	7.71E-01	2019	-0.16	8.76E-01	6253
GPR109A/B/81	rs3922628	T	A	0.20	2.61	9.59E-03	1597	1.13	2.58E-01	2684	0.56	5.73E-01	1434	3.12	1.81E-03	2017	2.81	4.95E-03	6135
LIPC	rs2070895	A	G	0.20	2.60	9.84E-03	1600	1.56	1.18E-01	2693	3.48	5.16E-04	1541	2.43	1.50E-02	2020	4.13	3.59E-05	6254
LPL	rs1121923	A	G	0.04	2.26	1.01E-02	1600	-0.12	9.02E-01	2691	0.13	8.97E-01	1544	-1.16	2.47E-01	2019	-0.67	5.01E-01	6254
PON1/2/3/4	rs17881071	A	G	0.20	-2.63	1.02E-02	1600	-0.54	5.89E-01	2691	1.47	1.43E-01	1541	1.06	2.89E-01	2020	0.98	3.30E-01	6252
LIPC	rs261332	A	G	0.18	2.61	1.02E-02	1600	1.33	1.82E-01	2692	3.54	4.16E-04	1544	2.47	1.34E-02	2019	4.03	5.50E-05	6255
LPL	rs285	A	G	0.43	2.45	1.03E-02	1600	1.52	1.29E-01	2692	1.84	6.67E-02	1542	1.11	2.69E-01	2020	2.53	1.13E-02	6254
PAFAH1B2	rs4938349	G	A	0.23	2.69	1.06E-02	1599	2.11	3.47E-02	2693	-0.68	4.98E-01	1539	-0.19	8.51E-01	2020	0.94	3.46E-01	6252
LIPC	rs4775067	A	C	0.23	2.28	1.09E-02	1595	-0.25	8.01E-01	2623	-1.00	3.16E-01	1537	1.50	1.32E-01	2016	0.20	8.45E-01	6176
PON1/2/3/4	rs854568	G	A	0.22	2.97	1.09E-02	1600	1.09	2.74E-01	2693	0.33	7.44E-01	1543	0.74	4.58E-01	2020	1.30	1.93E-01	6256
HDLBP	rs2305071	C	G	0.12	-2.41	1.10E-02	1600	1.18	2.37E-01	2693	0.15	8.77E-01	1536	0.89	3.72E-01	2020	1.36	1.74E-01	6249
PON1/2/3/4	rs13228784	G	A	0.23	2.59	1.11E-02	1600	0.67	5.06E-01	2693	0.70	4.84E-01	1543	2.48	1.30E-02	2020	2.20	2.81E-02	6256
PON1/2/3/4	rs740264	C	A	0.23	2.59	1.11E-02	1600	0.60	5.48E-01	2693	0.77	4.42E-01	1543	2.45	1.42E-02	2019	2.17	3.01E-02	6255
PAFAH1B2	rs10790175	A	G	0.23	2.69	1.12E-02	1600	2.26	2.38E-02	2693	-0.75	4.51E-01	1540	-0.23	8.19E-01	2020	0.98	3.28E-01	6253
LIPC	rs1800588	A	G	0.19	2.54	1.15E-02	1600	1.33	1.85E-01	2692	3.46	5.64E-04	1541	2.62	8.70E-03	2019	4.07	4.65E-05	6252
PON1/2/3/4	rs2272365	C	A	0.16	-2.67	1.15E-02	1600	0.23	8.16E-01	2692	0.23	8.21E-01	1542	0.11	9.13E-01	2020	0.33	7.44E-01	6254
LPL	rs3289	G	A	0.03	-2.30	1.16E-02	1600	-2.23	2.58E-02	2692	-1.51	1.32E-01	1542	-1.08	2.81E-01	2020	-2.83	4.73E-03	6254

PCSK5	rs1339248	G	A	0.13	2.48	1.19E-02	1600	0.54	5.88E-01	2689	1.43	1.53E-01	1544	-1.55	1.21E-01	2020	0.19	8.53E-01	6253
ABCA1	rs4149313	G	A	0.13	2.26	1.19E-02	1600	1.56	1.20E-01	2693	1.42	1.56E-01	1543	-0.01	9.88E-01	2020	1.72	8.61E-02	6256
RXRA	rs1805348	A	G	0.01	2.35	1.19E-02	1600	-0.15	8.84E-01	2693	-1.10	2.70E-01	1542	-1.17	2.41E-01	2020	-1.31	1.90E-01	6255
GPR109A/B/81	rs7972971	C	A	0.37	2.52	1.20E-02	1589	-0.72	4.74E-01	2681	-2.13	3.30E-02	1537	-1.87	6.09E-02	2016	-2.59	9.49E-03	6234
CETP	rs12447839	G	A	0.24	-2.05	1.21E-02	1585	-2.18	2.97E-02	2587	-0.62	5.34E-01	1540	-2.75	5.93E-03	2016	-3.30	9.71E-04	6143
PPARA	rs9626737	G	A	0.03	-2.53	1.21E-02	1600	0.63	5.29E-01	2693	1.18	2.38E-01	1537	0.46	6.49E-01	2020	1.26	2.09E-01	6250
LCAT	rs17240399	A	G	0.01	-2.23	1.23E-02	1576	-0.28	7.82E-01	2470	-0.89	3.74E-01	1431	-0.10	9.22E-01	2014	-0.67	5.01E-01	5915
PLTP	rs11569668	A	G	0.03	-2.34	1.26E-02	1599	0.49	6.24E-01	2684	-0.86	3.91E-01	1510	0.54	5.88E-01	2018	0.21	8.35E-01	6212
NFKB1	rs1598857	A	G	0.35	2.37	1.33E-02	1599	1.08	2.80E-01	2686	-0.28	7.83E-01	1538	1.96	4.94E-02	2018	1.69	9.12E-02	6242
CETP	rs289715	A	T	0.11	2.27	1.35E-02	1600	0.03	9.77E-01	2693	2.65	8.07E-03	1543	2.63	8.61E-03	2020	2.83	4.69E-03	6256
PCSK5	rs17668141	A	G	0.38	-2.58	1.36E-02	1600	-2.39	1.70E-02	2692	-1.56	1.18E-01	1544	1.41	1.59E-01	2019	-1.54	1.23E-01	6255
CUBN	rs2271469	A	C	0.53	-2.43	1.39E-02	1600	1.57	1.17E-01	2693	-0.36	7.17E-01	1544	1.84	6.58E-02	2020	0.20	8.43E-01	6257
APOA1/A4/A5/C3	rs689243	G	C	0.35	2.51	1.39E-02	1600	2.25	2.43E-02	2693	0.03	9.79E-01	1541	-0.42	6.78E-01	2020	1.26	2.10E-01	6254
CETP	rs4783962	A	G	0.24	-2.00	1.39E-02	1600	-2.18	2.96E-02	2693	-0.66	5.09E-01	1540	-2.61	9.14E-03	2019	-3.24	1.21E-03	6252
PPARG	rs1152001	G	A	0.20	2.36	1.41E-02	1599	-0.71	4.77E-01	2692	-0.38	7.04E-01	1541	-2.84	4.52E-03	2020	-2.27	2.33E-02	6253
PPARD	rs1053049	G	A	0.25	2.47	1.44E-02	1600	2.05	4.05E-02	2691	0.09	9.29E-01	1536	0.46	6.44E-01	2020	1.65	9.85E-02	6247
LIPC	rs4775070	A	G	0.03	2.47	1.44E-02	1600	1.59	1.13E-01	2693	0.45	6.52E-01	1544	1.75	8.04E-02	2020	2.26	2.40E-02	6257
LPL	rs258	G	C	0.41	2.43	1.49E-02	1600	1.34	1.81E-01	2693	1.95	5.16E-02	1540	1.25	2.11E-01	2018	2.56	1.06E-02	6251
SOAT1	rs4421551	C	A	0.13	2.55	1.52E-02	1600	2.12	3.40E-02	2690	0.90	3.68E-01	1530	0.06	9.56E-01	2020	1.87	6.16E-02	6240
PCSK5	rs4552981	A	T	0.46	2.55	1.53E-02	1600	1.33	1.82E-01	2693	0.56	5.74E-01	1544	-0.27	7.84E-01	2019	1.00	3.18E-01	6256
ABCG1	rs4148139	A	G	0.19	2.46	1.53E-02	1600	2.84	4.57E-03	2693	0.95	3.41E-01	1543	1.46	1.44E-01	2020	3.16	1.56E-03	6256

LPL	rs253	A	G	0.41	2.45	1.57E-02	1600	1.58	1.15E-01	2692	1.42	1.56E-01	1537	1.08	2.78E-01	2020	2.36	1.85E-02	6249
NFKB1	rs1599961	A	G	0.36	2.32	1.59E-02	1600	1.03	3.01E-01	2693	-0.29	7.72E-01	1539	1.97	4.88E-02	2020	1.65	9.81E-02	6252
CUBN	rs7893634	A	G	0.39	-2.41	1.59E-02	1600	0.94	3.47E-01	2693	-1.81	7.03E-02	1542	0.46	6.44E-01	2019	-0.02	9.85E-01	6254
PCSK5	rs2789608	G	C	0.38	2.45	1.61E-02	1599	2.63	8.58E-03	2693	0.93	3.54E-01	1543	-1.36	1.73E-01	2020	1.41	1.58E-01	6256
CETP	rs4587963	A	T	0.23	-1.95	1.67E-02	1597	-2.28	2.29E-02	2686	-0.33	7.40E-01	1533	-2.80	5.16E-03	2019	-3.25	1.16E-03	6238
LIPC	rs1869145	G	A	0.22	2.13	1.71E-02	1600	-0.75	4.52E-01	2690	-0.92	3.58E-01	1538	1.53	1.25E-01	2019	-0.08	9.38E-01	6247
NFKB1	rs3774933	G	A	0.36	2.28	1.72E-02	1600	1.02	3.06E-01	2692	-0.21	8.32E-01	1540	2.02	4.29E-02	2019	1.72	8.60E-02	6251
LRP1	rs7398375	G	C	0.28	-2.23	1.74E-02	1600	1.10	2.72E-01	2693	0.61	5.44E-01	1541	0.74	4.58E-01	2020	1.44	1.49E-01	6254
ABCA1	rs2472507	C	A	0.22	2.23	1.76E-02	1600	1.57	1.16E-01	2693	0.71	4.77E-01	1544	1.38	1.69E-01	2020	2.17	3.02E-02	6257
NFKB1	rs4648004	G	A	0.36	-2.25	1.79E-02	1599	0.46	6.42E-01	2693	0.59	5.55E-01	1542	-1.65	9.98E-02	2020	-0.34	7.36E-01	6255
TCF1	rs2464196	A	G	0.32	2.62	1.80E-02	1600	1.42	1.55E-01	2693	-0.37	7.08E-01	1532	-0.05	9.61E-01	2020	0.72	4.72E-01	6245
PCSK5	rs1856508	A	C	0.08	2.29	1.80E-02	1598	1.01	3.12E-01	2690	1.33	1.83E-01	1537	0.40	6.86E-01	2020	1.55	1.20E-01	6247
FADS1/2/3	rs102275	G	A	0.35	-2.44	1.81E-02	1600	-2.19	2.88E-02	2693	-0.75	4.54E-01	1541	-2.91	3.64E-03	2020	-3.46	5.42E-04	6254
ABCG4	rs626776	G	C	0.35	-2.03	1.81E-02	1600	-0.07	9.46E-01	2693	1.57	1.16E-01	1543	2.59	9.48E-03	2020	2.21	2.71E-02	6256
RXRA	rs35180144	C	A	0.09	-2.11	1.82E-02	1598	-1.42	1.57E-01	2693	-0.31	7.60E-01	1544	0.10	9.24E-01	2019	-1.03	3.04E-01	6256
GPR109A/B/81	rs4759383	G	A	0.45	-2.64	1.82E-02	1600	0.99	3.23E-01	2693	1.57	1.16E-01	1544	0.68	4.94E-01	2020	1.82	6.90E-02	6257
CUBN	rs1687714	A	C	0.35	2.22	1.83E-02	1600	-1.80	7.27E-02	2693	0.73	4.68E-01	1544	0.69	4.91E-01	2020	-0.43	6.70E-01	6257
LIPC	rs12900448	A	G	0.22	2.09	1.84E-02	1600	-0.57	5.70E-01	2693	-0.84	4.00E-01	1543	1.56	1.19E-01	2020	-0.10	9.24E-01	6256
LIPC	rs12898984	A	G	0.22	2.08	1.84E-02	1600	-0.59	5.56E-01	2693	-0.88	3.81E-01	1544	1.56	1.19E-01	2020	-0.06	9.49E-01	6257
PPARD	rs2076167	G	A	0.24	2.38	1.89E-02	1600	2.08	3.78E-02	2693	0.15	8.82E-01	1543	0.39	7.00E-01	2020	1.66	9.77E-02	6256
SCARB1	rs4765623	A	G	0.34	2.11	1.90E-02	1600	0.88	3.81E-01	2692	0.86	3.90E-01	1544	-0.63	5.27E-01	2020	0.64	5.21E-01	6256

CUBN	rs1707289	C	A	0.35	2.19	1.92E-02	1597	-1.86	6.36E-02	2689	0.73	4.64E-01	1537	0.65	5.14E-01	2020	-0.48	6.30E-01	6246
LRP1	rs715948	A	G	0.32	-2.32	1.99E-02	1600	1.00	3.17E-01	2693	1.54	1.23E-01	1544	2.02	4.32E-02	2020	2.57	1.01E-02	6257
FAS	rs1291206	A	G	0.21	2.22	2.00E-02	1597	0.48	6.31E-01	2690	0.40	6.92E-01	1518	-1.51	1.30E-01	2020	-0.35	7.27E-01	6228
ABCA1	rs2275545	G	A	0.16	-2.27	2.11E-02	1600	-0.26	7.95E-01	2693	-1.75	7.97E-02	1542	-1.90	5.74E-02	2020	-2.12	3.40E-02	6255
LIPC	rs588136	G	A	0.19	2.36	2.11E-02	1585	2.10	3.63E-02	2670	3.38	7.58E-04	1531	2.19	2.89E-02	2020	4.29	1.81E-05	6221
PPARD	rs2267667	G	C	0.25	2.35	2.11E-02	1600	1.80	7.14E-02	2693	0.73	4.68E-01	1544	0.43	6.68E-01	2020	1.79	7.40E-02	6257
LIPC	rs12909642	A	C	0.14	-2.19	2.13E-02	1600	0.47	6.36E-01	2693	-1.21	2.25E-01	1543	0.37	7.12E-01	2018	-0.08	9.35E-01	6254
NFKB1	rs4648011	C	A	0.36	2.22	2.15E-02	1600	0.93	3.52E-01	2693	-0.03	9.73E-01	1538	2.15	3.19E-02	2018	1.81	6.98E-02	6249
PLTP	rs378114	A	G	0.26	1.91	2.17E-02	1598	1.17	2.43E-01	2693	0.65	5.18E-01	1543	1.97	4.83E-02	2020	2.21	2.72E-02	6256
PON1/2/3/4	rs11768074	A	G	0.14	2.36	2.19E-02	1600	-0.39	6.96E-01	2693	0.35	7.23E-01	1543	1.20	2.29E-01	2020	0.60	5.46E-01	6256
LPL	rs10099160	C	A	0.22	-2.50	2.22E-02	1600	-1.12	2.65E-01	2693	-0.30	7.67E-01	1542	-1.75	7.93E-02	2020	-1.88	6.06E-02	6255
ABCG1	rs914189	C	G	0.19	2.34	2.23E-02	1600	2.78	5.50E-03	2693	1.20	2.29E-01	1544	1.51	1.32E-01	2020	3.27	1.06E-03	6257
PPARG	rs2067819	A	G	0.20	2.23	2.25E-02	1599	0.19	8.50E-01	2692	-0.51	6.11E-01	1542	-0.88	3.76E-01	2017	-0.63	5.28E-01	6251
APOE/C1/C2	rs1064725	C	A	0.04	2.09	2.25E-02	1600	-0.34	7.33E-01	2691	0.03	9.72E-01	1542	-1.23	2.20E-01	2020	-0.90	3.66E-01	6253
LIPC	rs4774301	A	G	0.23	2.04	2.27E-02	1600	-0.87	3.85E-01	2693	-0.74	4.59E-01	1543	1.65	9.92E-02	2020	0.00	9.99E-01	6256
ABCA1	rs3780542	A	G	0.07	2.16	2.28E-02	1600	0.32	7.47E-01	2693	1.03	3.05E-01	1536	1.32	1.88E-01	2018	1.47	1.42E-01	6247
CUBN	rs1707277	A	G	0.35	2.13	2.31E-02	1600	-1.78	7.53E-02	2692	0.74	4.57E-01	1544	0.67	5.06E-01	2020	-0.42	6.76E-01	6256
LPL	rs3200218	G	A	0.22	-2.49	2.31E-02	1600	-1.20	2.32E-01	2693	-0.26	7.98E-01	1540	-1.68	9.25E-02	2020	-1.87	6.18E-02	6253
ABCA1	rs2275544	G	A	0.15	-2.26	2.32E-02	1599	-0.49	6.26E-01	2693	-1.81	7.02E-02	1542	-1.76	7.87E-02	2019	-2.22	2.65E-02	6254
LIPC	rs17301781	A	G	0.14	-2.14	2.38E-02	1600	0.23	8.17E-01	2693	-1.26	2.09E-01	1544	0.33	7.40E-01	2020	-0.29	7.76E-01	6257
HNF4A	rs11574736	G	C	0.16	2.56	2.44E-02	1600	1.26	2.07E-01	2693	-0.76	4.50E-01	1540	-2.49	1.28E-02	2019	-0.96	3.37E-01	6252

ABCB4	rs8187799	G	A	0.09	-2.11	2.45E-02	1600	-0.45	6.51E-01	2693	-0.88	3.78E-01	1544	-0.53	5.99E-01	2020	-1.03	3.01E-01	6257
PON1/2/3/4	rs705382	C	G	0.35	2.45	2.50E-02	1599	-0.84	4.01E-01	2693	1.44	1.51E-01	1544	0.93	3.52E-01	2020	0.69	4.89E-01	6257
CUBN	rs4525114	G	A	0.05	1.91	2.53E-02	1599	-0.62	5.35E-01	2692	-0.53	5.95E-01	1543	-0.88	3.80E-01	2018	-1.17	2.42E-01	6253
PCSK6	rs7179905	T	A	0.18	2.40	2.55E-02	1503	0.01	9.93E-01	2624	-0.44	6.57E-01	1496	NA	NA	0	-0.26	7.95E-01	4120
LIPC	rs8028759	G	A	0.32	2.02	2.56E-02	1600	-0.06	9.54E-01	2693	1.80	7.17E-02	1543	1.00	3.16E-01	2020	1.43	1.54E-01	6256
SORCS1	rs17121941	G	A	0.09	2.32	2.61E-02	1600	-0.51	6.12E-01	2687	2.05	4.03E-02	1544	0.53	5.93E-01	2020	0.99	3.22E-01	6251
SOAT1	rs3753525	A	C	0.27	2.43	2.61E-02	1600	1.72	8.54E-02	2693	0.13	8.98E-01	1541	-0.47	6.41E-01	2020	0.93	3.54E-01	6254
ABCA1	rs3847300	A	G	0.14	-2.11	2.62E-02	1505	-0.95	3.41E-01	2632	-2.45	1.46E-02	1495	-1.66	9.75E-02	2018	-2.78	5.47E-03	6145
CUBN	rs1707278	C	G	0.35	2.08	2.67E-02	1600	-1.91	5.58E-02	2692	0.79	4.31E-01	1542	0.70	4.85E-01	2020	-0.47	6.41E-01	6254
SORCS1	rs12243117	A	G	0.01	2.03	2.67E-02	1600	0.75	4.53E-01	2693	-1.13	2.58E-01	1544	-0.15	8.80E-01	2020	-0.16	8.76E-01	6257
PCSK5	rs3814115	G	A	0.35	-2.24	2.70E-02	1600	-2.05	4.04E-02	2687	0.73	4.69E-01	1544	0.96	3.35E-01	2020	-0.44	6.63E-01	6251
APOE/C1/C2	rs2075650	G	A	0.15	-2.34	2.74E-02	1600	-4.15	3.46E-05	2693	-2.31	2.12E-02	1544	-1.36	1.73E-01	2020	-4.64	3.55E-06	6257
HDLBP	rs2305076	A	G	0.10	-2.09	2.74E-02	1600	0.68	4.98E-01	2693	1.32	1.88E-01	1544	0.75	4.51E-01	2020	1.53	1.27E-01	6257
PON1/2/3/4	rs11764079	A	G	0.24	2.23	2.75E-02	1600	0.60	5.46E-01	2693	1.27	2.03E-01	1538	2.33	2.00E-02	2019	2.35	1.88E-02	6250
PON1/2/3/4	rs13226149	A	G	0.24	2.22	2.75E-02	1600	0.41	6.78E-01	2693	1.26	2.08E-01	1538	2.20	2.76E-02	2020	2.15	3.16E-02	6251
CUBN	rs10904839	G	A	0.22	-2.21	2.77E-02	1600	0.77	4.40E-01	2693	-1.32	1.88E-01	1544	0.90	3.66E-01	2020	-0.37	7.15E-01	6257
PCSK5	rs1023181	G	A	0.29	2.24	2.79E-02	1600	0.15	8.83E-01	2693	0.51	6.12E-01	1541	1.81	6.97E-02	2020	1.38	1.68E-01	6254
SCARB1	rs10744182	G	A	0.41	-2.15	2.82E-02	1545	0.36	7.17E-01	2604	0.32	7.48E-01	1351	0.93	3.51E-01	2001	0.93	3.50E-01	5956
PDZK1IP1	rs11211477	A	G	0.28	-1.91	2.84E-02	1600	0.75	4.53E-01	2693	1.42	1.56E-01	1543	-0.24	8.09E-01	2020	1.06	2.89E-01	6256
SCARB1	rs1070544	C	A	0.03	2.03	2.84E-02	1600	0.54	5.92E-01	2693	1.08	2.79E-01	1543	-0.41	6.78E-01	2019	0.65	5.14E-01	6255
NFKB1	rs230541	G	A	0.37	2.17	2.84E-02	1600	1.52	1.29E-01	2693	-0.01	9.91E-01	1541	1.96	4.98E-02	2019	2.11	3.52E-02	6253

ABCA1	rs3858076	C	A	0.16	-2.18	2.90E-02	1599	-0.47	6.42E-01	2692	-1.81	7.01E-02	1541	-1.88	5.96E-02	2020	-2.28	2.29E-02	6253
FAS	rs9658771	A	G	0.02	2.09	2.98E-02	1600	-0.63	5.30E-01	2693	-0.21	8.36E-01	1543	1.91	5.60E-02	2020	0.57	5.68E-01	6256
LIPC	rs12914552	G	C	0.18	-2.00	3.00E-02	1600	0.11	9.16E-01	2693	-1.42	1.57E-01	1542	0.28	7.79E-01	2020	-0.48	6.35E-01	6255
LIPC	rs9652472	G	A	0.05	2.30	3.02E-02	1599	1.19	2.36E-01	2683	-0.73	4.64E-01	1542	0.66	5.10E-01	2020	0.79	4.31E-01	6245
PPARA	rs4253650	A	G	0.04	-2.17	3.03E-02	1599	1.21	2.27E-01	2690	-0.68	4.99E-01	1544	-0.05	9.60E-01	2019	0.43	6.69E-01	6253
ABCA1	rs1800977	A	G	0.36	2.24	3.05E-02	1600	2.27	2.34E-02	2693	0.72	4.74E-01	1543	0.64	5.24E-01	2020	2.21	2.74E-02	6256
NFKB1	rs1287	A	G	0.37	2.13	3.17E-02	1600	1.47	1.41E-01	2692	-0.02	9.83E-01	1536	2.01	4.48E-02	2019	2.10	3.59E-02	6247
PPARD	rs9658105	A	G	0.04	-2.14	3.20E-02	1600	-0.38	7.07E-01	2693	-1.85	6.46E-02	1542	0.17	8.61E-01	2020	-1.07	2.87E-01	6255
LIPG	rs4245232	A	C	0.19	-2.07	3.22E-02	1585	-0.36	7.16E-01	2684	NA	NA	0	-0.11	9.12E-01	2020	-0.35	7.28E-01	4704
ABCA1	rs2065412	G	A	0.41	-2.00	3.24E-02	1600	-0.78	4.35E-01	2693	-0.79	4.27E-01	1543	-1.03	3.03E-01	2020	-1.49	1.36E-01	6256
RXRA	rs7853153	A	G	0.03	2.19	3.26E-02	1600	2.07	3.89E-02	2691	-0.24	8.11E-01	1541	-0.19	8.49E-01	2020	1.13	2.59E-01	6252
LIPC	rs8039477	G	A	0.12	2.02	3.29E-02	1597	1.00	3.17E-01	2692	0.89	3.75E-01	1534	-0.71	4.77E-01	2020	0.69	4.89E-01	6246
SCARB1	rs12229555	G	A	0.21	2.06	3.32E-02	1599	0.52	6.04E-01	2693	-0.14	8.87E-01	1542	-0.69	4.91E-01	2019	-0.12	9.03E-01	6254
PPARD	rs9658083	G	C	0.08	1.84	3.36E-02	1600	0.07	9.44E-01	2689	0.12	9.01E-01	1544	-0.48	6.28E-01	2019	-0.17	8.67E-01	6252
ABCA1	rs13284054	G	A	0.14	-2.04	3.52E-02	1579	-1.44	1.52E-01	2661	-2.39	1.70E-02	1537	-1.53	1.27E-01	2017	-3.00	2.74E-03	6215
NFKB1	rs1598861	C	A	0.43	-1.89	3.52E-02	1555	0.28	7.78E-01	2097	0.47	6.39E-01	1493	-1.87	6.20E-02	1967	-0.69	4.88E-01	5557
FAS	rs6010621	A	C	0.20	1.95	3.52E-02	1599	-0.15	8.81E-01	2693	0.02	9.81E-01	1541	-0.57	5.71E-01	2020	-0.41	6.83E-01	6254
PPARD	rs7751726	A	G	0.04	1.93	3.55E-02	1600	1.51	1.32E-01	2693	0.69	4.92E-01	1544	-0.75	4.55E-01	2017	0.91	3.64E-01	6254
SORCS1	rs822090	A	G	0.04	-1.96	3.55E-02	1600	-0.29	7.74E-01	2687	1.89	5.95E-02	1544	-1.16	2.47E-01	2019	-0.09	9.29E-01	6250
PPARA	rs4253760	C	A	0.19	-2.00	3.57E-02	1591	1.51	1.30E-01	2682	1.38	1.69E-01	1526	0.43	6.64E-01	2019	1.92	5.47E-02	6227
FAS	rs6010620	A	G	0.21	1.94	3.58E-02	1600	-0.15	8.81E-01	2693	0.02	9.81E-01	1541	-0.57	5.71E-01	2020	-0.41	6.83E-01	6254

NFKB1	rs12509403	A	G	0.30	2.11	3.58E-02	1600	1.42	1.55E-01	2693	0.22	8.23E-01	1542	1.87	6.11E-02	2019	2.11	3.50E-02	6254
HDLBP	rs2305075	G	A	0.10	-1.97	3.62E-02	1600	0.71	4.79E-01	2693	1.17	2.41E-01	1544	0.76	4.48E-01	2020	1.48	1.39E-01	6257
APOA1/A4/A5/C3	rs12286037	A	G	0.08	-2.33	3.64E-02	1600	-2.08	3.75E-02	2693	-1.36	1.74E-01	1543	-1.19	2.36E-01	2018	-2.71	6.65E-03	6254
CUBN	rs11254312	A	C	0.43	2.03	3.66E-02	1600	-1.38	1.69E-01	2693	1.59	1.12E-01	1523	-0.24	8.07E-01	2013	-0.26	7.96E-01	6229
NFKB1	rs4648058	C	G	0.29	2.10	3.70E-02	1600	1.49	1.36E-01	2690	0.30	7.61E-01	1543	1.90	5.76E-02	2020	2.21	2.72E-02	6253
ABCA1	rs2575876	A	G	0.28	-1.93	3.76E-02	1600	-1.44	1.50E-01	2693	-0.77	4.41E-01	1542	-2.06	3.95E-02	2020	-2.50	1.25E-02	6255
NR5A2	rs2248673	G	A	0.09	1.80	3.79E-02	1600	0.43	6.65E-01	2688	0.39	7.00E-01	1543	-0.38	7.03E-01	2019	0.26	7.96E-01	6250
PPARD	rs9470001	G	C	0.08	1.80	3.84E-02	1600	0.05	9.63E-01	2693	0.12	9.01E-01	1544	-0.48	6.29E-01	2020	0.18	8.56E-01	6257
ALCAM	rs1017913	C	A	0.38	-2.08	3.84E-02	1584	-1.03	3.04E-01	2657	1.49	1.37E-01	1542	-0.48	6.30E-01	2016	-0.21	8.37E-01	6215
FAS	rs2297438	G	A	0.21	1.91	3.85E-02	1599	-0.15	8.81E-01	2693	0.17	8.67E-01	1541	-0.57	5.71E-01	2020	-0.34	7.36E-01	6254
NFKB1	rs4648133	G	A	0.29	2.01	3.87E-02	1600	0.97	3.31E-01	2693	0.00	9.99E-01	1544	1.73	8.33E-02	2020	1.62	1.05E-01	6257
SCARB1	rs745529	A	C	0.30	2.32	3.90E-02	1600	0.66	5.09E-01	2693	0.25	7.99E-01	1541	0.49	6.25E-01	2020	0.84	4.02E-01	6254
FAS	rs2236507	G	C	0.20	1.95	3.96E-02	1599	-0.34	7.35E-01	2693	0.02	9.87E-01	1540	-0.72	4.69E-01	2020	-0.63	5.32E-01	6253
ABCG8	rs11124950	A	G	0.07	1.65	4.07E-02	1600	1.29	1.96E-01	2693	-1.35	1.78E-01	1544	-0.97	3.33E-01	2020	-0.37	7.10E-01	6257
CAV1/2	rs3807992	A	G	0.23	1.99	4.07E-02	1600	0.48	6.30E-01	2692	-0.84	4.02E-01	1541	-1.46	1.44E-01	2020	-0.93	3.53E-01	6253
CAV1/2	rs7804372	A	T	0.23	2.00	4.07E-02	1600	0.51	6.07E-01	2692	-0.72	4.74E-01	1542	-1.46	1.44E-01	2020	-0.85	3.97E-01	6254
NFKB1	rs747559	G	A	0.36	1.96	4.07E-02	1600	1.19	2.36E-01	2693	-0.30	7.64E-01	1539	1.95	5.08E-02	2019	1.74	8.19E-02	6251
SCARB1	rs838878	A	G	0.30	1.82	4.11E-02	1600	1.70	8.85E-02	2693	1.94	5.23E-02	1543	1.59	1.12E-01	2020	2.99	2.83E-03	6256
PPARD	rs6457816	G	A	0.09	1.80	4.11E-02	1600	0.10	9.19E-01	2693	0.42	6.76E-01	1544	-0.66	5.07E-01	2020	-0.10	9.18E-01	6257
LIPC	rs12898801	A	G	0.38	1.76	4.13E-02	1600	-0.39	6.99E-01	2693	-0.86	3.91E-01	1538	0.54	5.88E-01	2019	-0.37	7.10E-01	6250
NFKB1	rs3817685	C	G	0.29	2.05	4.13E-02	1600	1.53	1.26E-01	2693	0.26	7.96E-01	1541	1.79	7.29E-02	2019	2.15	3.15E-02	6253

PPARG	rs2881654	A	G	0.11	1.86	4.21E-02	1565	1.17	2.44E-01	2484	-0.29	7.70E-01	1444	-1.35	1.76E-01	2012	-0.18	8.58E-01	5940
PON1/2/3/4	rs2299264	A	G	0.22	2.08	4.27E-02	1593	0.64	5.20E-01	2688	1.84	6.65E-02	1362	2.27	2.34E-02	2019	2.61	9.19E-03	6069
GPR109A/B/81	rs4759361	T	A	0.17	2.13	4.27E-02	1600	1.87	6.16E-02	2691	0.16	8.72E-01	1542	2.38	1.72E-02	2019	2.66	7.80E-03	6252
ABCA1	rs13290420	G	A	0.13	-1.97	4.27E-02	1600	-0.81	4.17E-01	2693	-2.62	8.88E-03	1544	-1.64	1.02E-01	2020	-2.76	5.74E-03	6257
PCSK5	rs2275406	A	G	0.12	-1.82	4.27E-02	1596	-1.84	6.63E-02	2693	-0.07	9.41E-01	1537	-0.38	7.03E-01	2020	-1.46	1.45E-01	6250
SORCS1	rs11193220	G	A	0.02	-2.02	4.27E-02	1600	-1.23	2.20E-01	2693	1.52	1.28E-01	1544	-1.53	1.26E-01	2020	-0.92	3.59E-01	6257
PCSK5	rs17719860	A	G	0.10	2.09	4.30E-02	1600	-0.22	8.29E-01	2693	0.84	4.01E-01	1544	0.17	8.66E-01	2019	0.37	7.10E-01	6256
NFKB1	rs980455	G	A	0.36	1.93	4.34E-02	1600	1.25	2.13E-01	2693	-0.33	7.41E-01	1538	1.91	5.62E-02	2019	1.74	8.21E-02	6250
ABCA1	rs4149297	G	A	0.11	-1.92	4.42E-02	1600	-0.65	5.17E-01	2693	-1.00	3.20E-01	1543	0.77	4.39E-01	2020	-0.48	6.32E-01	6256
GPR109A/B/81	rs579935	A	C	0.17	2.14	4.45E-02	1579	1.81	6.98E-02	2640	0.12	9.08E-01	1474	2.36	1.82E-02	1998	2.60	9.38E-03	6112
ABCG1	rs221948	A	G	0.10	-1.69	4.47E-02	1600	0.42	6.77E-01	2693	-0.35	7.27E-01	1544	-1.15	2.49E-01	2020	-0.56	5.79E-01	6257
PPARD	rs6906237	A	C	0.08	1.75	4.49E-02	1600	0.35	7.24E-01	2693	0.14	8.87E-01	1544	-0.45	6.56E-01	2020	0.05	9.61E-01	6257
PPARA	rs8138102	G	A	0.24	-2.05	4.49E-02	1599	1.42	1.57E-01	2692	1.87	6.21E-02	1544	-0.31	7.53E-01	2020	1.68	9.36E-02	6256
LIPC	rs12592017	G	A	0.24	1.85	4.49E-02	1600	-0.82	4.11E-01	2692	-0.84	4.01E-01	1543	1.16	2.48E-01	2020	0.30	7.64E-01	6255
PPARA	rs4253778	C	G	0.19	-1.91	4.51E-02	1600	1.64	1.02E-01	2693	1.24	2.15E-01	1544	0.39	6.95E-01	2019	1.91	5.60E-02	6256
PCSK5	rs10781328	A	G	0.12	-1.82	4.53E-02	1597	-2.02	4.34E-02	2687	0.29	7.71E-01	1532	-0.67	5.01E-01	2018	-1.56	1.18E-01	6237
ABCB11	rs2216504	A	G	0.04	2.04	4.67E-02	1600	0.55	5.82E-01	2693	0.07	9.44E-01	1544	0.91	3.61E-01	2020	0.92	3.60E-01	6257
NFKB1	rs4648051	G	A	0.28	1.95	4.71E-02	1599	1.09	2.78E-01	2690	0.03	9.73E-01	1539	1.98	4.75E-02	2018	1.86	6.35E-02	6247
CETP	rs1800776	A	C	0.08	-1.63	4.72E-02	1600	0.29	7.70E-01	2693	-2.10	3.57E-02	1544	-1.79	7.37E-02	2020	-1.87	6.18E-02	6257
ABCA1	rs3890182	A	G	0.13	-1.94	4.72E-02	1600	-0.89	3.75E-01	2692	-2.51	1.21E-02	1543	-1.72	8.56E-02	2020	-2.80	5.04E-03	6255
SCARB1	rs10846745	G	C	0.43	-1.90	4.73E-02	1600	0.76	4.45E-01	2693	1.37	1.70E-01	1541	-0.65	5.16E-01	2020	0.81	4.16E-01	6254

PON1/2/3/4	rs2158806	C	A	0.22	2.04	4.75E-02	1599	0.68	4.97E-01	2691	2.17	3.04E-02	1544	2.21	2.68E-02	2020	2.78	5.44E-03	6255
CETP	rs158480	G	A	0.12	1.74	4.75E-02	1505	-0.07	9.43E-01	2204	2.06	3.92E-02	1388	2.70	6.84E-03	1997	2.60	9.34E-03	5589
PON1/2/3/4	rs854565	A	G	0.28	1.98	4.78E-02	1600	0.00	9.98E-01	2693	0.75	4.52E-01	1543	0.76	4.50E-01	2019	0.80	4.23E-01	6255
CD36	rs3212013	A	G	0.04	-1.99	4.80E-02	1593	-0.49	6.24E-01	2666	-0.52	6.00E-01	1542	0.05	9.61E-01	2020	-0.55	5.80E-01	6228
PON1/2/3/4	rs7493	G	C	0.22	2.03	4.87E-02	1600	0.66	5.10E-01	2693	2.36	1.86E-02	1543	2.20	2.81E-02	2019	2.85	4.39E-03	6255
PON1/2/3/4	rs12026	C	G	0.22	2.03	4.87E-02	1600	0.71	4.81E-01	2692	2.24	2.52E-02	1542	2.21	2.68E-02	2020	2.83	4.62E-03	6254
ABCG5	rs1864814	A	G	0.04	1.98	4.89E-02	1600	1.44	1.51E-01	2693	1.62	1.05E-01	1544	-0.42	6.71E-01	2020	1.51	1.32E-01	6257
LIPC	rs261342	G	C	0.20	1.99	4.89E-02	1594	2.18	2.94E-02	2689	3.55	3.96E-04	1538	2.26	2.37E-02	2020	4.47	7.70E-06	6247
PON1/2/3/4	rs3757707	A	G	0.26	2.16	4.90E-02	1600	0.67	5.05E-01	2693	1.26	2.09E-01	1543	1.37	1.71E-01	2019	1.84	6.59E-02	6255
PPARA	rs11703495	A	T	0.12	-2.14	4.91E-02	1600	-0.79	4.30E-01	2693	0.31	7.55E-01	1544	-0.44	6.60E-01	2020	-0.61	5.40E-01	6257
APOA1/A4/A5/C3	rs619054	A	G	0.23	1.94	4.94E-02	1586	2.06	3.94E-02	2676	-0.13	8.96E-01	1523	0.60	5.51E-01	2018	1.63	1.04E-01	6217
PCSK5	rs6560494	C	G	0.38	1.68	4.96E-02	1600	1.38	1.69E-01	2691	-1.46	1.45E-01	1540	1.61	1.08E-01	2018	1.09	2.74E-01	6249

A, allele; MAF, Minor allele frequency from Penn-CC; T, T-statistic; P, P-value; Z, Z-statistic; N, Sample size

Supplemental Table 3. Meta-Analysis SNPs with Suggestive Evidence of Association

					Penn-CC			Penn-RC			MONICA/KORA			GRAPHIC			Meta-analysis		
Locus	SNP	A1	A2	MAF	T	P	N	T	P	N	T	P	N	Z	P	N	Z	P	N
CETP	rs17231506	A	G	0.30	7.57	3.82E-14	1600	6.25	4.68E-10	2691	6.84	1.12E-11	1536	7.83	5.00E-15	2020	14.04	8.85E-45	7847
CETP	rs3764261	A	C	0.32	7.47	7.82E-14	1600	6.15	8.94E-10	2693	6.93	6.36E-12	1542	7.83	4.77E-15	2019	13.98	2.15E-44	7854
CETP	rs1800775	A	C	0.50	7.70	1.40E-14	1600	5.63	2.04E-08	2693	5.82	7.14E-09	1536	6.57	4.95E-11	2020	12.66	1.06E-36	7849
CETP	rs1532624	A	C	0.41	7.35	2.03E-13	1600	4.13	3.68E-05	2693	6.17	8.81E-10	1543	7.01	2.43E-12	2020	12.00	3.50E-33	7856
CETP	rs1532625	A	G	0.41	7.36	1.89E-13	1549	4.14	3.65E-05	2605	5.90	4.38E-09	1506	7.14	9.45E-13	2017	11.97	5.24E-33	7677
CETP	rs711752	A	G	0.41	7.75	9.33E-15	1600	4.23	2.44E-05	2693	5.84	6.25E-09	1539	6.69	2.30E-11	2019	11.93	8.02E-33	7851
CETP	rs708272	A	G	0.41	7.75	9.33E-15	1600	4.23	2.44E-05	2693	5.84	6.28E-09	1540	6.67	2.52E-11	2020	11.93	8.73E-33	7853
CETP	rs1864163	A	G	0.25	-7.68	1.66E-14	1598	-4.68	3.05E-06	2692	-6.37	2.48E-10	1541	-5.68	1.32E-08	2020	-11.88	1.47E-32	7851
CETP	rs12720922	A	G	0.19	-7.52	5.63E-14	1600	-5.76	9.57E-09	2693	-5.36	9.56E-08	1540	-5.25	1.50E-07	2019	-11.78	4.98E-32	7852
CETP	rs7499892	A	G	0.19	-7.77	8.01E-15	1600	-5.73	1.10E-08	2693	-5.21	2.18E-07	1542	-5.17	2.36E-07	2018	-11.77	5.63E-32	7853
CETP	rs11508026	A	G	0.40	7.46	8.65E-14	1600	4.07	4.93E-05	2690	5.76	1.00E-08	1534	6.61	3.80E-11	2020	11.64	2.72E-31	7844
CETP	rs11076175	G	A	0.18	-7.81	5.55E-15	1597	-5.62	2.10E-08	2692	-5.05	5.07E-07	1538	-5.06	4.26E-07	2018	-11.60	4.26E-31	7845
CETP	rs7203984	C	A	0.22	-7.52	5.41E-14	1600	-5.48	4.74E-08	2693	-4.90	1.08E-06	1539	-4.73	2.25E-06	2019	-11.15	7.05E-29	7851
CETP	rs9939224	A	C	0.21	-7.40	1.37E-13	1600	-5.66	1.65E-08	2693	-4.94	8.66E-07	1541	-3.97	7.27E-05	2020	-10.84	2.31E-27	7854
CETP	rs11076176	C	A	0.19	-6.33	2.41E-10	1599	-4.68	2.98E-06	2692	-4.74	2.34E-06	1537	-5.08	3.79E-07	2019	-10.26	1.05E-24	7847
CETP	rs289714	G	A	0.21	-6.28	3.30E-10	1600	-4.71	2.57E-06	2693	-4.12	3.92E-05	1540	-4.72	2.35E-06	2019	-9.81	1.07E-22	7852
CETP	rs12708967	G	A	0.19	-3.42	6.38E-04	1600	-2.63	8.60E-03	2687	-4.42	1.07E-05	1544	-5.02	5.19E-07	2019	-7.58	3.54E-14	7850
CETP	rs12720918	G	A	0.28	-2.64	8.21E-03	1599	-3.56	3.74E-04	2693	-3.77	1.69E-04	1543	-4.68	2.86E-06	2020	-7.32	2.55E-13	7855
CETP	rs4783961	A	G	0.50	4.52	6.26E-06	1600	3.76	1.72E-04	2691	2.78	5.44E-03	1537	3.43	6.03E-04	2020	7.21	5.59E-13	7848
LPL	rs264	A	G	0.15	3.57	3.60E-04	1599	3.54	4.13E-04	2691	2.73	6.39E-03	1543	3.63	2.87E-04	2019	6.73	1.75E-11	7852
LPL	rs12679834	G	A	0.10	4.15	3.32E-05	1598	3.12	1.83E-03	2691	3.08	2.10E-03	1538	3.22	1.28E-03	2013	6.69	2.18E-11	7840
LPL	rs328	G	C	0.10	4.27	1.99E-05	1600	3.20	1.42E-03	2693	2.91	3.62E-03	1544	3.14	1.68E-03	2020	6.68	2.45E-11	7857

LPL	rs256	A	G	0.14	3.49	4.77E-04	1600	3.32	8.98E-04	2693	2.88	3.99E-03	1543	3.63	2.82E-04	2020	6.64	3.18E-11	7856
LPL	rs3208305	T	A	0.32	4.87	1.14E-06	1593	3.19	1.42E-03	2675	2.27	2.31E-02	1530	2.99	2.77E-03	2019	6.59	4.43E-11	7817
LPL	rs13702	G	A	0.33	4.85	1.25E-06	1599	3.16	1.58E-03	2693	2.26	2.43E-02	1543	3.01	2.62E-03	2020	6.56	5.34E-11	7855
CETP	rs1800777	A	G	0.03	-2.92	3.49E-03	1599	-3.65	2.68E-04	2692	-4.28	2.00E-05	1541	-2.38	1.74E-02	2020	-6.55	5.84E-11	7852
CETP	rs5880	C	G	0.04	-2.53	1.13E-02	1600	-4.15	3.50E-05	2693	-4.18	3.04E-05	1544	-2.22	2.67E-02	2020	-6.54	6.24E-11	7857
LPL	rs263	A	G	0.20	4.25	2.17E-05	1600	3.15	1.67E-03	2693	2.67	7.62E-03	1541	3.01	2.62E-03	2020	6.47	1.01E-10	7854
LPL	rs331	A	G	0.28	3.70	2.20E-04	1600	3.28	1.04E-03	2693	2.01	4.48E-02	1539	3.41	6.45E-04	2020	6.21	5.40E-10	7852
LPL	rs3916027	A	G	0.28	3.79	1.50E-04	1596	3.26	1.13E-03	2692	2.03	4.30E-02	1533	3.32	9.11E-04	2012	6.20	5.77E-10	7833
LPL	rs301	G	A	0.25	4.27	2.00E-05	1597	3.67	2.43E-04	2693	1.26	2.07E-01	1541	3.06	2.21E-03	2019	6.18	6.26E-10	7850
LPL	rs3779788	A	G	0.14	4.03	5.71E-05	1600	2.78	5.45E-03	2693	2.91	3.65E-03	1543	2.83	4.67E-03	2020	6.17	6.99E-10	7856
LPL	rs3735964	A	C	0.10	3.97	7.10E-05	1600	2.97	3.02E-03	2693	2.09	3.69E-02	1543	3.34	8.40E-04	2019	6.15	7.87E-10	7855
LPL	rs255	G	A	0.16	3.21	1.34E-03	1600	3.42	6.48E-04	2693	2.10	3.57E-02	1542	3.27	1.06E-03	2020	6.04	1.59E-09	7855
LPL	rs271	A	G	0.15	3.28	1.06E-03	1600	2.99	2.83E-03	2693	2.29	2.21E-02	1541	3.36	7.88E-04	2018	5.94	2.80E-09	7852
LPL	rs327	C	A	0.29	3.24	1.19E-03	1599	3.49	4.94E-04	2681	1.69	9.22E-02	1525	3.25	1.16E-03	2020	5.90	3.67E-09	7825
LPL	rs320	C	A	0.29	3.44	5.85E-04	1596	3.41	6.67E-04	2690	1.63	1.03E-01	1530	3.18	1.49E-03	2019	5.88	4.12E-09	7835
LIPG	rs2156552	A	T	0.14	-4.07	4.80E-05	1600	-2.30	2.16E-02	2693	-0.95	3.40E-01	1543	-3.37	7.48E-04	2020	-5.31	1.09E-07	7856
CETP	rs4784745	G	A	0.32	-3.74	1.83E-04	1600	-0.16	8.76E-01	2693	-2.13	3.36E-02	1544	-5.09	3.53E-07	2019	-5.30	1.14E-07	7856
LIPG	rs1943981	T	A	0.14	-4.10	4.19E-05	1600	-2.32	2.04E-02	2693	-0.87	3.86E-01	1544	-3.37	7.63E-04	2020	-5.30	1.18E-07	7857
APOE/C1/C2	rs2075650	G	A	0.13	-2.34	1.93E-02	1600	-4.15	3.46E-05	2693	-2.31	2.12E-02	1544	-1.36	1.73E-01	2020	-5.19	2.07E-07	7857
CETP	rs4784744	A	G	0.33	-3.44	5.86E-04	1600	-0.10	9.20E-01	2693	-2.10	3.60E-02	1544	-5.11	3.25E-07	2020	-5.13	2.90E-07	7857
APOE/C1/C2	rs12721046	A	G	0.12	-3.65	2.61E-04	1597	-3.65	2.63E-04	2676	-1.36	1.75E-01	1522	-1.28	2.00E-01	2019	-5.04	4.76E-07	7814
CETP	rs291044	A	G	0.33	-3.37	7.41E-04	1600	-0.08	9.39E-01	2693	-1.91	5.64E-02	1542	-5.02	5.25E-07	2020	-4.96	7.17E-07	7855
CETP	rs289717	A	G	0.33	-3.48	4.99E-04	1600	-0.02	9.88E-01	2693	-1.94	5.21E-02	1537	-4.92	8.69E-07	2020	-4.94	8.00E-07	7850
FADS1/2/3	rs174570	A	G	0.11	-2.95	3.22E-03	1600	-2.92	3.52E-03	2693	-2.65	8.16E-03	1543	-1.41	1.58E-01	2020	-4.93	8.37E-07	7856
FADS1/2/3	rs1535	G	A	0.30	-3.21	1.34E-03	1600	-2.78	5.41E-03	2693	-0.81	4.18E-01	1537	-2.92	3.49E-03	2020	-4.92	8.78E-07	7850
FADS1/2/3	rs174577	A	C	0.35	-3.61	3.03E-04	1520	-2.36	1.85E-02	2633	-1.05	2.92E-01	1364	-2.76	5.78E-03	2020	-4.89	1.00E-06	7537
LIPC	rs588136	G	A	0.22	2.36	1.83E-02	1585	2.10	3.63E-02	2670	3.38	7.58E-04	1531	2.19	2.89E-02	2020	-4.89	1.01E-06	7806

LIPC	rs261342	G	C	0.25	1.99	4.72E-02	1594	2.18	2.94E-02	2689	3.55	3.96E-04	1538	2.26	2.37E-02	2020	4.89	1.02E-06	7841
LIPC	rs2070895	A	G	0.23	2.60	9.35E-03	1600	1.56	1.18E-01	2693	3.48	5.16E-04	1541	2.43	1.50E-02	2020	4.86	1.17E-06	7854
LIPC	rs1800588	A	G	0.23	2.54	1.11E-02	1600	1.33	1.85E-01	2692	3.46	5.64E-04	1541	2.62	8.70E-03	2019	4.78	1.75E-06	7852
CETP	rs5882	G	A	0.34	4.11	4.02E-05	1600	0.09	9.24E-01	2693	2.94	3.36E-03	1543	3.10	1.95E-03	2019	4.78	1.76E-06	7855
LIPC	rs261332	A	G	0.19	2.61	9.11E-03	1600	1.33	1.82E-01	2692	3.54	4.16E-04	1544	2.47	1.34E-02	2019	4.78	1.79E-06	7855
LPL	rs343	A	C	0.09	3.18	1.46E-03	1595	2.19	2.90E-02	2683	1.58	1.14E-01	1538	2.54	1.11E-02	2019	4.70	2.57E-06	7835
CETP	rs289743	G	A	0.33	4.47	7.94E-06	1585	-0.46	6.43E-01	2593	3.12	1.84E-03	1519	3.05	2.33E-03	2016	4.70	2.66E-06	7713
LIPC	rs8033940	A	G	0.32	2.51	1.21E-02	1598	1.43	1.53E-01	2690	3.61	3.20E-04	1543	2.16	3.11E-02	2020	4.66	3.19E-06	7851
CETP	rs289718	G	A	0.32	4.40	1.06E-05	1598	-0.19	8.50E-01	2689	2.88	4.01E-03	1536	2.93	3.38E-03	2017	4.64	3.51E-06	7840
CETP	rs289719	A	G	0.32	4.38	1.21E-05	1599	-0.26	7.95E-01	2693	2.95	3.22E-03	1539	2.93	3.42E-03	2018	4.61	4.00E-06	7849
CETP	rs12597002	A	C	0.29	-2.87	4.15E-03	1600	-1.34	1.80E-01	2693	-1.69	9.18E-02	1544	-3.49	4.80E-04	2020	-4.60	4.30E-06	7857
CETP	rs6499863	A	G	0.16	-4.37	1.27E-05	1600	-0.81	4.16E-01	2693	-3.00	2.74E-03	1542	-1.55	1.21E-01	2020	-4.56	5.14E-06	7855
LPL	rs268	G	A	0.01	-3.48	5.11E-04	1600	-1.69	9.17E-02	2693	-3.95	8.30E-05	1543	-0.49	6.23E-01	2019	-4.55	5.38E-06	7855
CETP	rs12720889	A	T	0.29	4.68	2.93E-06	1596	-0.12	9.01E-01	2683	2.42	1.58E-02	1486	2.85	4.40E-03	2017	4.55	5.39E-06	7782
FADS1/2/3	rs174535	G	A	0.31	-2.76	5.80E-03	1598	-2.33	2.01E-02	2693	-0.92	3.56E-01	1542	-3.00	2.73E-03	2020	4.53	5.78E-06	7853
LIPC	rs8034802	A	T	0.29	2.51	1.21E-02	1599	1.20	2.30E-01	2692	3.33	8.78E-04	1541	2.31	2.07E-02	2017	4.48	7.36E-06	7849
FADS1/2/3	rs174601	A	G	0.37	-3.35	8.12E-04	1599	-2.12	3.44E-02	2689	-0.80	4.26E-01	1543	-2.68	7.34E-03	2020	-4.46	8.11E-06	7851
LIPC	rs11635491	A	G	0.26	2.72	6.49E-03	1596	1.43	1.53E-01	2688	2.83	4.73E-03	1524	2.22	2.67E-02	2011	4.44	9.07E-06	7819
FADS1/2/3	rs174576	A	C	0.32	-2.99	2.82E-03	1600	-2.44	1.48E-02	2693	-0.59	5.58E-01	1544	-2.76	5.78E-03	2020	-4.43	9.28E-06	7857
CETP	rs289716	T	A	0.32	4.32	1.58E-05	1600	-0.27	7.86E-01	2693	2.67	7.70E-03	1537	2.85	4.40E-03	2020	4.41	1.01E-05	7850
CETP	rs708273	A	G	0.28	-2.60	9.44E-03	1599	-1.40	1.63E-01	2693	-1.34	1.79E-01	1394	-3.52	4.24E-04	2019	-4.38	1.17E-05	7705
LIPC	rs261338	A	G	0.17	1.46	1.45E-01	1600	1.92	5.51E-02	2693	3.59	3.46E-04	1544	1.97	4.89E-02	2020	4.37	1.27E-05	7857
CETP	rs6499861	G	C	0.16	-4.11	4.03E-05	1600	-0.58	5.64E-01	2693	-2.81	4.99E-03	1543	-1.73	8.43E-02	2020	-4.31	1.63E-05	7856
LIPG	rs77960347	G	A	0.01	3.34	8.42E-04	1600	2.93	3.38E-03	2693	-0.21	8.30E-01	1544	2.15	3.17E-02	2020	4.22	2.48E-05	7857
LIPC	rs261341	A	G	0.34	1.72	8.63E-02	1600	1.35	1.78E-01	2693	3.26	1.15E-03	1542	2.38	1.73E-02	2019	4.21	2.55E-05	7854
FADS1/2/3	rs102275	G	A	0.35	-2.44	1.47E-02	1600	-2.19	2.88E-02	2693	-0.75	4.54E-01	1541	-2.91	3.64E-03	2020	-4.19	2.82E-05	7854
CETP	rs289742	C	G	0.14	2.48	1.30E-02	1600	0.13	9.01E-01	2692	3.44	5.93E-04	1543	2.74	6.05E-03	2020	4.11	3.99E-05	7855

LIPC	rs261336	G	A	0.17	1.55	1.21E-01	1600	2.32	2.03E-02	2693	2.93	3.45E-03	1544	1.40	1.62E-01	2020	4.07	4.81E-05	7857
APOA1/A4/A5/C3	rs12287066	A	C	0.08	-2.81	5.03E-03	1600	-2.05	4.03E-02	2691	-1.61	1.07E-01	1540	-1.65	9.89E-02	2019	-4.02	5.87E-05	7850
FADS1/2/3	rs2072114	G	A	0.12	-2.87	4.06E-03	1600	-1.79	7.36E-02	2693	-1.37	1.70E-01	1537	-2.09	3.67E-02	2020	-4.01	6.02E-05	7850
CETP	rs12447924	G	A	0.24	-2.13	3.31E-02	1597	-2.25	2.48E-02	2684	-0.72	4.69E-01	1538	-2.78	5.39E-03	2020	-4.01	6.10E-05	7839
ABCG1	rs914189	C	G	0.21	2.34	1.93E-02	1600	2.78	5.50E-03	2693	1.20	2.29E-01	1544	1.51	1.32E-01	2020	3.98	6.97E-05	7857
APOB	rs1801695	A	G	0.03	2.87	4.05E-03	1600	2.72	6.59E-03	2693	0.50	6.14E-01	1544	1.65	9.80E-02	2020	3.95	7.80E-05	7857
LPL	rs10104051	A	G	0.44	3.20	1.36E-03	1598	1.44	1.51E-01	2689	1.65	9.91E-02	1540	1.80	7.11E-02	2020	3.93	8.41E-05	7847
ABCG1	rs4148139	A	G	0.20	2.46	1.40E-02	1600	2.84	4.57E-03	2693	0.95	3.41E-01	1543	1.46	1.44E-01	2020	3.93	8.43E-05	7856
APOA1/A4/A5/C3	rs12285095	C	A	0.07	-2.85	4.39E-03	1600	-2.04	4.14E-02	2693	-1.42	1.56E-01	1544	-1.61	1.08E-01	2020	-3.92	8.69E-05	7857
CETP	rs736274	T	A	0.11	2.65	8.01E-03	1600	0.01	9.94E-01	2691	2.83	4.68E-03	1542	2.88	4.04E-03	2020	3.91	9.11E-05	7853
LPL	rs7009128	G	A	0.04	-2.73	6.34E-03	1600	-1.83	6.68E-02	2693	-1.01	3.13E-01	1543	-2.24	2.49E-02	2020	-3.89	1.00E-04	7856
CETP	rs11076174	G	A	0.09	-4.49	7.12E-06	1600	-2.37	1.80E-02	2693	-1.46	1.44E-01	1543	0.35	7.30E-01	2020	-3.88	1.03E-04	7856
FADS1/2/3	rs174548	C	G	0.28	-2.91	3.63E-03	1600	-1.86	6.32E-02	2692	0.01	9.92E-01	1542	-2.92	3.50E-03	2019	-3.88	1.06E-04	7853
CETP	rs12447839	G	A	0.22	-2.05	4.02E-02	1585	-2.18	2.97E-02	2587	-0.62	5.34E-01	1540	-2.75	5.93E-03	2016	-3.87	1.09E-04	7728
LIPC	rs485538	G	A	0.18	1.93	5.31E-02	1600	1.81	7.04E-02	2693	2.70	6.92E-03	1540	1.31	1.89E-01	2020	3.80	1.48E-04	7853
CETP	rs4783962	A	G	0.22	-2.00	4.61E-02	1600	-2.18	2.96E-02	2693	-0.66	5.09E-01	1540	-2.61	9.14E-03	2019	-3.79	1.51E-04	7852
LPL	rs28645722	A	G	0.03	-2.73	6.32E-03	1600	-1.45	1.47E-01	2693	-1.28	2.01E-01	1504	-2.24	2.52E-02	2019	-3.79	1.54E-04	7816
CETP	rs4587963	A	T	0.22	-1.95	5.12E-02	1597	-2.28	2.29E-02	2686	-0.33	7.40E-01	1533	-2.80	5.16E-03	2019	-3.78	1.57E-04	7835
ABCA1	rs3905001	G	C	0.28	1.53	1.27E-01	1598	1.74	8.17E-02	2693	1.85	6.52E-02	1540	2.43	1.51E-02	2020	3.76	1.71E-04	7851
LPL	rs28575919	C	G	0.04	-2.67	7.56E-03	1600	-1.59	1.12E-01	2693	-1.17	2.43E-01	1544	-2.18	2.94E-02	2020	-3.76	1.72E-04	7857
LPL	rs1470186	G	A	0.03	-2.73	6.34E-03	1600	-1.65	9.82E-02	2693	-1.01	3.11E-01	1544	-2.18	2.96E-02	2019	-3.75	1.75E-04	7856
LPL	rs6999612	G	A	0.04	-2.74	6.15E-03	1600	-1.40	1.63E-01	2693	-1.32	1.86E-01	1543	-2.18	2.94E-02	2020	-3.75	1.81E-04	7856
LPL	rs17091742	A	G	0.03	-2.73	6.34E-03	1600	-1.60	1.11E-01	2693	-1.03	3.02E-01	1544	-2.17	2.96E-02	2020	-3.73	1.95E-04	7857
LPL	rs28445964	G	A	0.03	-2.82	4.85E-03	1600	-1.51	1.32E-01	2693	-1.03	3.04E-01	1543	-2.18	2.94E-02	2020	-3.71	2.05E-04	7856
GPR109A/B/81	rs3922628	T	A	0.22	2.61	8.97E-03	1597	1.13	2.58E-01	2684	0.56	5.73E-01	1434	3.12	1.81E-03	2017	3.69	2.23E-04	7732
LPL	rs28615996	G	A	0.04	-2.73	6.32E-03	1600	-1.53	1.26E-01	2693	-1.03	3.02E-01	1544	-2.18	2.94E-02	2020	-3.69	2.24E-04	7857
LPL	rs7016529	G	A	0.04	-2.67	7.56E-03	1600	-1.59	1.12E-01	2693	-1.01	3.13E-01	1543	-2.18	2.94E-02	2020	-3.69	2.27E-04	7856

FADS1/2/3	rs2524299	T	A	0.12	-2.74	6.19E-03	1598	-1.29	1.98E-01	2691	-1.40	1.61E-01	1542	-2.03	4.24E-02	2019	-3.64	2.74E-04	7850
LPL	rs7000460	C	A	0.04	-2.73	6.32E-03	1600	-1.45	1.47E-01	2693	-1.01	3.13E-01	1542	-2.18	2.94E-02	2019	-3.63	2.81E-04	7854
LPL	rs1534649	A	C	0.45	3.31	9.50E-04	1594	1.33	1.83E-01	2578	1.16	2.48E-01	1532	1.63	1.03E-01	2019	3.62	2.96E-04	7723
LIPC	rs485671	A	C	0.17	1.77	7.68E-02	1600	1.54	1.25E-01	2693	2.85	4.45E-03	1543	1.30	1.95E-01	2020	3.62	3.00E-04	7856
ABCA1	rs1883025	A	G	0.27	-2.45	1.41E-02	1599	-1.37	1.71E-01	2693	-0.85	3.94E-01	1544	-2.62	8.86E-03	2020	-3.61	3.02E-04	7856
ABCA1	rs13284054	G	A	0.13	-2.04	4.17E-02	1579	-1.44	1.52E-01	2661	-2.39	1.70E-02	1537	-1.53	1.27E-01	2017	-3.59	3.28E-04	7794
LPL	rs3289	G	A	0.03	-2.30	2.16E-02	1600	-2.23	2.58E-02	2692	-1.51	1.32E-01	1542	-1.08	2.81E-01	2020	-3.56	3.75E-04	7854
CETP	rs289715	A	T	0.12	2.27	2.35E-02	1600	0.03	9.77E-01	2693	2.65	8.07E-03	1543	2.63	8.61E-03	2020	3.55	3.91E-04	7856
SCARB1	rs838878	A	G	0.34	1.82	6.93E-02	1600	1.70	8.85E-02	2693	1.94	5.23E-02	1543	1.59	1.12E-01	2020	3.48	4.94E-04	7856
APOA1/A4/A5/C3	rs12286037	A	G	0.08	-2.33	1.99E-02	1600	-2.08	3.75E-02	2693	-1.36	1.74E-01	1543	-1.19	2.36E-01	2018	-3.47	5.15E-04	7854
PON1/2/3/4	rs7493	G	C	0.24	2.03	4.22E-02	1600	0.66	5.10E-01	2693	2.36	1.86E-02	1543	2.20	2.81E-02	2019	3.46	5.42E-04	7855
PON1/2/3/4	rs12026	C	G	0.24	2.03	4.22E-02	1600	0.71	4.81E-01	2692	2.24	2.52E-02	1542	2.21	2.68E-02	2020	3.45	5.72E-04	7854
CETP	rs5883	A	G	0.06	3.92	8.77E-05	1600	2.49	1.29E-02	2693	-0.70	4.87E-01	1531	1.02	3.07E-01	2019	3.44	5.81E-04	7843
ABCA1	rs3847300	A	G	0.13	-2.11	3.49E-02	1505	-0.95	3.41E-01	2632	-2.45	1.46E-02	1495	-1.66	9.75E-02	2018	-3.43	6.13E-04	7650
PON1/2/3/4	rs2158806	C	A	0.24	2.04	4.10E-02	1599	0.68	4.97E-01	2691	2.17	3.04E-02	1544	2.21	2.68E-02	2020	3.40	6.67E-04	7854
NFKB1	rs3774964	G	A	0.36	2.62	8.90E-03	1600	2.03	4.30E-02	2693	-0.06	9.55E-01	1539	2.05	4.00E-02	2020	3.38	7.19E-04	7852
LPL	rs258	G	C	0.47	2.43	1.50E-02	1600	1.34	1.81E-01	2693	1.95	5.16E-02	1540	1.25	2.11E-01	2018	3.38	7.28E-04	7851
ABCA1	rs3890182	A	G	0.12	-1.94	5.27E-02	1600	-0.89	3.75E-01	2692	-2.51	1.21E-02	1543	-1.72	8.56E-02	2020	-3.38	7.33E-04	7855
LIPC	rs473224	A	C	0.14	1.61	1.07E-01	1600	1.15	2.49E-01	2693	3.11	1.90E-03	1544	1.16	2.47E-01	2020	3.37	7.58E-04	7857
LPL	rs285	A	G	0.50	2.45	1.43E-02	1600	1.52	1.29E-01	2692	1.84	6.67E-02	1542	1.11	2.69E-01	2020	3.37	7.61E-04	7854
PCSK6	rs1471656	A	G	0.45	2.02	4.31E-02	1600	1.35	1.77E-01	2693	2.39	1.72E-02	1538	1.19	2.35E-01	2020	3.36	7.75E-04	7851
ABCA1	rs13290420	G	A	0.14	-1.97	4.88E-02	1600	-0.81	4.17E-01	2693	-2.62	8.88E-03	1544	-1.64	1.02E-01	2020	-3.35	7.96E-04	7857
GPR109A/B/81	rs4759361	T	A	0.19	2.13	3.32E-02	1600	1.87	6.16E-02	2691	0.16	8.72E-01	1542	2.38	1.72E-02	2019	3.34	8.52E-04	7852
LPL	rs1800590	C	A	0.05	-2.44	1.47E-02	1600	-0.83	4.04E-01	2692	-1.31	1.92E-01	1544	-2.25	2.47E-02	2019	-3.31	9.43E-04	7855
GPR109A/B/81	rs579935	A	C	0.20	2.14	3.23E-02	1579	1.81	6.98E-02	2640	0.12	9.08E-01	1474	2.36	1.82E-02	1998	3.29	1.02E-03	7691
PON1/2/3/4	rs2299264	A	G	0.24	2.08	3.75E-02	1593	0.64	5.20E-01	2688	1.84	6.65E-02	1362	2.27	2.34E-02	2019	3.27	1.09E-03	7662
ABCA1	rs4100654	G	A	0.10	-3.04	2.40E-03	1599	-0.93	3.52E-01	2692	-2.04	4.13E-02	1543	-0.83	4.08E-01	2020	-3.24	1.20E-03	7854

LPL	rs253	A	G	0.46	2.45	1.42E-02	1600	1.58	1.15E-01	2692	1.42	1.56E-01	1537	1.08	2.78E-01	2020	3.21	1.33E-03	7849
LIPC	rs4774297	C	A	0.49	2.57	1.03E-02	1600	1.47	1.43E-01	2693	0.57	5.66E-01	1539	1.78	7.51E-02	2020	3.17	1.51E-03	7852
LIPC	rs572410	C	G	0.27	2.92	3.54E-03	1600	1.12	2.62E-01	2693	1.43	1.52E-01	1542	1.06	2.88E-01	2020	3.15	1.65E-03	7855
LIPC	rs4775070	A	G	0.08	2.47	1.34E-02	1600	1.59	1.13E-01	2693	0.45	6.52E-01	1544	1.75	8.04E-02	2020	3.13	1.74E-03	7857
PON1/2/3/4	rs13228784	G	A	0.25	2.59	9.71E-03	1600	0.67	5.06E-01	2693	0.70	4.84E-01	1543	2.48	1.30E-02	2020	3.13	1.77E-03	7856
APOB	rs1801699	G	A	0.02	-1.69	9.12E-02	1600	-0.53	5.96E-01	2691	-2.53	1.14E-02	1542	-1.83	6.75E-02	2020	-3.12	1.80E-03	7853
PON1/2/3/4	rs740264	C	A	0.25	2.59	9.59E-03	1600	0.60	5.48E-01	2693	0.77	4.42E-01	1543	2.45	1.42E-02	2019	3.11	1.90E-03	7855
LPL	rs1031045	A	G	0.05	-2.44	1.47E-02	1600	-0.59	5.56E-01	2693	-1.25	2.11E-01	1544	-2.18	2.94E-02	2020	-3.10	1.91E-03	7857
APOE/C1/C2	rs405509	A	C	0.47	-1.61	1.09E-01	1593	-2.58	1.00E-02	2690	-0.09	9.30E-01	1543	-1.64	1.00E-01	2020	-3.10	1.91E-03	7846
PCSK5	rs1340510	G	A	0.28	1.41	1.59E-01	1599	2.42	1.54E-02	2692	2.94	3.39E-03	1542	-0.49	6.24E-01	2019	3.10	1.91E-03	7852
PON1/2/3/4	rs11764079	A	G	0.27	2.23	2.59E-02	1600	0.60	5.46E-01	2693	1.27	2.03E-01	1538	2.33	2.00E-02	2019	3.10	1.92E-03	7850
ABCA1	rs2575876	A	G	0.26	-1.93	5.32E-02	1600	-1.44	1.50E-01	2693	-0.77	4.41E-01	1542	-2.06	3.95E-02	2020	-3.10	1.93E-03	7855
APOE/C1/C2	rs5167	C	A	0.37	1.16	2.45E-01	1600	0.34	7.34E-01	2692	2.94	3.30E-03	1543	2.12	3.42E-02	2020	3.10	1.94E-03	7855
APOB	rs673548	A	G	0.22	3.04	2.34E-03	1599	0.78	4.35E-01	2693	1.72	8.61E-02	1544	1.00	3.19E-01	2020	3.10	1.95E-03	7856
APOB	rs676210	A	G	0.21	3.07	2.17E-03	1600	0.76	4.47E-01	2693	1.73	8.37E-02	1543	0.98	3.26E-01	2020	3.09	1.97E-03	7856
GALNT2	rs2144300	G	A	0.44	-2.07	3.90E-02	1600	-2.32	2.02E-02	2692	-0.43	6.64E-01	1542	-1.18	2.37E-01	2020	-3.08	2.05E-03	7854
NFKB1	rs230528	C	A	0.39	2.57	1.02E-02	1573	1.38	1.66E-01	2664	0.26	7.94E-01	1417	1.91	5.62E-02	2018	3.07	2.14E-03	7672
PON1/2/3/4	rs17885069	A	G	0.26	1.88	6.07E-02	1600	0.48	6.31E-01	2693	1.83	6.76E-02	1542	2.21	2.70E-02	2020	3.06	2.22E-03	7855
CETP	rs820299	G	A	0.39	-1.43	1.53E-01	1600	0.29	7.74E-01	2693	-1.91	5.70E-02	1544	-3.42	6.16E-04	2019	-3.06	2.24E-03	7856
PON1/2/3/4	rs11981433	G	A	0.41	-0.04	9.65E-01	1599	-0.37	7.15E-01	2693	-3.08	2.11E-03	1543	-2.86	4.27E-03	2020	-3.05	2.32E-03	7855
PON1/2/3/4	rs11981299	T	A	0.25	1.90	5.75E-02	1600	0.55	5.86E-01	2684	1.67	9.43E-02	1527	2.21	2.70E-02	2020	3.04	2.37E-03	7831
NFKB1	rs4648127	A	G	0.06	-0.83	4.08E-01	1599	-2.46	1.39E-02	2691	-0.33	7.38E-01	1543	-2.12	3.39E-02	2020	-3.04	2.39E-03	7853
GALNT2	rs4846914	G	A	0.44	-2.07	3.90E-02	1600	-2.29	2.23E-02	2691	-0.36	7.19E-01	1541	-1.19	2.35E-01	2019	-3.03	2.44E-03	7851
ABCA1	rs3858076	C	A	0.16	-2.18	2.90E-02	1599	-0.47	6.42E-01	2692	-1.81	7.01E-02	1541	-1.88	5.96E-02	2020	-3.02	2.56E-03	7852
LCAT	rs2292318	A	G	0.14	0.00	9.96E-01	1600	1.22	2.24E-01	2693	2.48	1.33E-02	1509	2.37	1.76E-02	2020	3.01	2.62E-03	7822
ABCA1	rs2275544	G	A	0.14	-2.26	2.40E-02	1599	-0.49	6.26E-01	2693	-1.81	7.02E-02	1542	-1.76	7.87E-02	2019	-3.00	2.71E-03	7853
APOB	rs2678379	A	G	0.22	2.89	3.84E-03	1600	0.70	4.86E-01	2693	1.70	8.99E-02	1544	1.03	3.04E-01	2020	2.99	2.83E-03	7857

ABCA1	rs1800977	A	G	0.35	2.24	2.49E-02	1600	2.27	2.34E-02	2693	0.72	4.74E-01	1543	0.64	5.24E-01	2020	2.98	2.88E-03	7856
PON1/2/3/4	rs7803148	A	G	0.40	-0.02	9.88E-01	1600	-0.12	9.08E-01	2693	-3.11	1.91E-03	1541	-3.02	2.56E-03	2020	-2.98	2.89E-03	7854
ABCA1	rs2472507	C	A	0.22	2.23	2.58E-02	1600	1.57	1.16E-01	2693	0.71	4.77E-01	1544	1.38	1.69E-01	2020	2.94	3.28E-03	7857
LCAT	rs255052	A	G	0.15	0.14	8.85E-01	1599	1.17	2.41E-01	2692	1.85	6.42E-02	1538	2.67	7.57E-03	2019	2.93	3.44E-03	7848
PON1/2/3/4	rs13226149	A	G	0.27	2.22	2.64E-02	1600	0.41	6.78E-01	2693	1.26	2.08E-01	1538	2.20	2.76E-02	2020	2.92	3.50E-03	7851
NFKB1	rs4648058	C	G	0.31	2.10	3.56E-02	1600	1.49	1.36E-01	2690	0.30	7.61E-01	1543	1.90	5.76E-02	2020	2.92	3.50E-03	7853
ABCA1	rs2740485	C	A	0.12	-1.93	5.39E-02	1600	-2.66	7.96E-03	2690	-0.83	4.07E-01	1532	-0.25	8.01E-01	2020	-2.92	3.51E-03	7842
ABCA1	rs2275545	G	A	0.16	-2.27	2.30E-02	1600	-0.26	7.95E-01	2693	-1.75	7.97E-02	1542	-1.90	5.74E-02	2020	-2.92	3.52E-03	7855
APOB	rs1042034	G	A	0.21	2.72	6.56E-03	1600	0.74	4.61E-01	2692	1.73	8.43E-02	1542	0.95	3.40E-01	2020	2.91	3.65E-03	7854
ABCA1	rs2472496	G	A	0.39	-0.96	3.39E-01	1600	-1.56	1.18E-01	2693	-1.59	1.13E-01	1540	-1.68	9.39E-02	2019	-2.90	3.75E-03	7852
PCSK5	rs7031971	G	A	0.47	-3.50	4.64E-04	1600	-2.21	2.71E-02	2693	0.03	9.76E-01	1544	-0.07	9.47E-01	2019	-2.90	3.80E-03	7856
NFKB1	rs997476	A	C	0.06	-0.84	3.99E-01	1598	-2.71	6.86E-03	2693	0.03	9.76E-01	1542	-1.84	6.56E-02	2019	-2.88	3.92E-03	7852
ABCA1	rs2000069	A	G	0.49	-0.47	6.36E-01	1600	-2.03	4.29E-02	2693	-1.36	1.74E-01	1543	-1.73	8.41E-02	2019	-2.88	4.00E-03	7855
NFKB1	rs230541	G	A	0.40	2.17	3.04E-02	1600	1.52	1.29E-01	2693	-0.01	9.91E-01	1541	1.96	4.98E-02	2019	2.86	4.29E-03	7853
LIPC	rs8041059	A	G	0.49	-1.43	1.52E-01	1599	-1.75	8.03E-02	2692	-0.72	4.72E-01	1540	-1.70	8.84E-02	2017	-2.85	4.33E-03	7848
ABCA1	rs2422493	A	G	0.48	1.31	1.92E-01	1597	2.24	2.49E-02	2692	0.37	7.14E-01	1524	1.55	1.22E-01	2020	2.85	4.34E-03	7833
APOA1/A4/A5/C3	rs1729409	G	A	0.48	-2.01	4.42E-02	1600	-1.84	6.64E-02	2693	-0.96	3.37E-01	1540	-0.87	3.85E-01	2020	-2.85	4.38E-03	7853
NFKB1	rs3817685	C	G	0.31	2.05	4.03E-02	1600	1.53	1.26E-01	2693	0.26	7.96E-01	1541	1.79	7.29E-02	2019	2.85	4.44E-03	7853
PPARD	rs2016520	G	A	0.23	1.83	6.70E-02	1600	2.05	4.06E-02	2693	0.73	4.67E-01	1544	0.97	3.31E-01	2020	2.84	4.51E-03	7857
PLTP	rs378114	A	G	0.29	1.91	5.60E-02	1598	1.17	2.43E-01	2693	0.65	5.18E-01	1543	1.97	4.83E-02	2020	2.83	4.60E-03	7854
NFKB1	rs1287	A	G	0.40	2.13	3.33E-02	1600	1.47	1.41E-01	2692	-0.02	9.83E-01	1536	2.01	4.48E-02	2019	2.83	4.62E-03	7847
NFKB1	rs12509403	A	G	0.31	2.11	3.51E-02	1600	1.42	1.55E-01	2693	0.22	8.23E-01	1542	1.87	6.11E-02	2019	2.83	4.62E-03	7854
APOA1/A4/A5/C3	rs10750097	G	A	0.24	-1.44	1.50E-01	1599	-1.05	2.96E-01	2693	-0.30	7.66E-01	1542	-2.83	4.60E-03	2020	-2.83	4.65E-03	7854
SOAT1	rs4421551	C	A	0.14	2.55	1.08E-02	1600	2.12	3.40E-02	2690	0.90	3.68E-01	1530	0.06	9.56E-01	2020	2.82	4.81E-03	7840
SCARB1	rs865716	A	T	0.50	3.90	9.62E-05	1600	0.90	3.67E-01	2688	0.79	4.32E-01	1531	0.36	7.20E-01	2020	2.82	4.81E-03	7839
ABCA1	rs2043664	A	G	0.27	-0.74	4.59E-01	1600	-1.77	7.73E-02	2693	-1.06	2.88E-01	1544	-1.92	5.43E-02	2020	-2.82	4.88E-03	7857
LPL	rs10099160	C	A	0.21	-2.50	1.23E-02	1600	-1.12	2.65E-01	2693	-0.30	7.67E-01	1542	-1.75	7.93E-02	2020	-2.80	5.04E-03	7855

LPL	rs2197089	G	A	0.43	-1.74	8.26E-02	1592	-1.30	1.96E-01	2681	-1.57	1.17E-01	1534	-1.12	2.62E-01	2019	-2.80	5.05E-03	7826
LPL	rs3200218	G	A	0.21	-2.49	1.27E-02	1600	-1.20	2.32E-01	2693	-0.26	7.98E-01	1540	-1.68	9.25E-02	2020	-2.79	5.24E-03	7853
LIPC	rs17190517	A	G	0.42	-1.28	2.01E-01	1599	-0.83	4.09E-01	2688	-1.75	8.08E-02	1540	-1.87	6.10E-02	2019	-2.79	5.36E-03	7846
PCSK5	rs12683707	A	G	0.03	-1.88	5.96E-02	1600	-2.53	1.15E-02	2693	-0.61	5.42E-01	1544	-0.31	7.54E-01	2020	-2.76	5.81E-03	7857
LRP2	rs34291900	A	G	0.03	-0.66	5.11E-01	1600	-3.16	1.59E-03	2693	-1.49	1.38E-01	1544	0.10	9.17E-01	2020	-2.75	5.95E-03	7857
LIPC	rs4775072	A	G	0.06	0.67	5.06E-01	1600	2.69	7.29E-03	2693	-0.09	9.30E-01	1544	1.78	7.54E-02	2020	2.73	6.26E-03	7857
LIPC	rs6494005	G	A	0.49	-1.61	1.07E-01	1600	-0.80	4.25E-01	2693	-1.17	2.43E-01	1539	-2.00	4.54E-02	2020	-2.73	6.40E-03	7852
SCARB1	rs4379922	G	A	0.35	2.41	1.59E-02	1600	1.62	1.06E-01	2693	1.20	2.31E-01	1543	0.31	7.54E-01	2019	2.73	6.43E-03	7855
ABCA1	rs2230808	A	G	0.30	-0.98	3.29E-01	1600	-3.17	1.54E-03	2693	-0.81	4.18E-01	1543	-0.07	9.45E-01	2020	-2.69	7.17E-03	7856
CETP	rs158477	G	A	0.48	0.90	3.68E-01	1600	0.64	5.21E-01	2693	0.86	3.92E-01	1543	3.01	2.62E-03	2020	2.69	7.20E-03	7856
PCSK6	rs7165901	C	G	0.29	1.19	2.34E-01	1600	1.67	9.58E-02	2693	1.49	1.37E-01	1543	0.96	3.36E-01	2019	2.66	7.82E-03	7855
LIPC	rs12914035	G	A	0.14	-1.91	5.67E-02	1598	-0.66	5.07E-01	2686	-2.74	6.13E-03	1536	-0.39	6.99E-01	2019	-2.66	7.85E-03	7839
SCARB1	rs10773112	G	A	0.30	-1.08	2.81E-01	1600	-1.24	2.17E-01	2693	-1.70	8.90E-02	1543	-1.36	1.73E-01	2019	-2.66	7.94E-03	7855
PPARD	rs2267667	G	C	0.30	2.35	1.90E-02	1600	1.80	7.14E-02	2693	0.73	4.68E-01	1544	0.43	6.68E-01	2020	2.65	7.97E-03	7857
ABCA1	rs3780543	G	A	0.15	2.59	9.73E-03	1600	1.49	1.36E-01	2683	1.32	1.87E-01	1526	0.02	9.84E-01	2019	2.64	8.42E-03	7828
PPARD	rs9658081	A	G	0.03	1.56	1.19E-01	1600	1.42	1.55E-01	2686	0.71	4.81E-01	1544	1.53	1.25E-01	2019	2.63	8.62E-03	7849
NFKB1	rs4648011	C	A	0.39	2.22	2.62E-02	1600	0.93	3.52E-01	2693	-0.03	9.73E-01	1538	2.15	3.19E-02	2018	2.62	8.76E-03	7849
PON1/2/3/4	rs3757707	A	G	0.29	2.16	3.09E-02	1600	0.67	5.05E-01	2693	1.26	2.09E-01	1543	1.37	1.71E-01	2019	2.62	8.91E-03	7855
PPARD	rs1053049	G	A	0.29	2.47	1.36E-02	1600	2.05	4.05E-02	2691	0.09	9.29E-01	1536	0.46	6.44E-01	2020	2.59	9.65E-03	7847
ABCA1	rs3847305	C	G	0.19	-1.80	7.19E-02	1600	-0.03	9.75E-01	2693	-1.65	9.98E-02	1543	-2.02	4.38E-02	2020	-2.58	9.80E-03	7856
PPARD	rs760783	A	C	0.16	0.88	3.78E-01	1600	2.65	8.18E-03	2693	0.48	6.35E-01	1544	0.84	4.02E-01	2020	2.58	9.83E-03	7857
ABCA1	rs12341993	A	C	0.13	-3.22	1.26E-03	1600	-0.08	9.37E-01	2693	-0.94	3.48E-01	1543	-1.31	1.91E-01	2020	-2.58	9.86E-03	7856
NFKB1	rs1598857	A	G	0.38	2.37	1.77E-02	1599	1.08	2.80E-01	2686	-0.28	7.83E-01	1538	1.96	4.94E-02	2018	2.58	9.92E-03	7841
NFKB1	rs1609798	A	G	0.29	1.67	9.56E-02	1600	0.91	3.61E-01	2693	0.88	3.79E-01	1539	1.77	7.59E-02	2020	2.58	9.96E-03	7852
LIPC	rs12900622	G	A	0.14	-1.86	6.34E-02	1600	-0.54	5.90E-01	2692	-2.65	8.20E-03	1541	-0.48	6.34E-01	2019	-2.57	1.03E-02	7852
ABCA1	rs12235875	G	A	0.08	2.48	1.30E-02	1600	0.56	5.72E-01	2682	0.90	3.67E-01	1537	1.40	1.61E-01	2019	2.56	1.04E-02	7838
PCSK5	rs12343074	A	G	0.02	1.54	1.23E-01	1600	3.18	1.49E-03	2693	0.16	8.76E-01	1544	-0.12	9.02E-01	2020	2.56	1.04E-02	7857

NFKB1	rs3774933	G	A	0.38	2.28	2.24E-02	1600	1.02	3.06E-01	2692	-0.21	8.32E-01	1540	2.02	4.29E-02	2019	2.56	1.04E-02	7851
NR5A2	rs7551367	G	A	0.17	-1.55	1.22E-01	1598	-0.81	4.19E-01	2693	-2.77	5.66E-03	1541	-0.32	7.52E-01	2019	-2.56	1.06E-02	7851
PPARD	rs2267669	G	A	0.18	1.31	1.90E-01	1599	2.15	3.15E-02	2693	0.87	3.83E-01	1544	0.63	5.32E-01	2020	2.56	1.06E-02	7856
PLTP	rs11569671	A	G	0.03	-1.82	6.91E-02	1597	-2.11	3.52E-02	2677	-0.04	9.66E-01	1527	-0.95	3.45E-01	2020	-2.55	1.07E-02	7821
ABCA1	rs4149313	G	A	0.17	2.26	2.38E-02	1600	1.56	1.20E-01	2693	1.42	1.56E-01	1543	-0.01	9.88E-01	2020	2.55	1.07E-02	7856
PPARD	rs2076167	G	A	0.29	2.38	1.74E-02	1600	2.08	3.78E-02	2693	0.15	8.82E-01	1543	0.39	7.00E-01	2020	2.55	1.08E-02	7856
PPARD	rs2076166	A	G	0.16	1.01	3.11E-01	1597	2.63	8.49E-03	2690	0.35	7.27E-01	1538	0.77	4.40E-01	2019	2.55	1.09E-02	7844
PCSK5	rs17668141	A	G	0.36	-2.58	9.94E-03	1600	-2.39	1.70E-02	2692	-1.56	1.18E-01	1544	1.41	1.59E-01	2019	-2.54	1.11E-02	7855
LIPG	rs9958734	G	A	0.05	1.38	1.67E-01	1600	1.29	1.96E-01	2693	1.27	2.06E-01	1544	1.18	2.40E-01	2020	2.54	1.12E-02	7857
NFKB1	rs4648051	G	A	0.28	1.95	5.10E-02	1599	1.09	2.78E-01	2690	0.03	9.73E-01	1539	1.98	4.75E-02	2018	2.54	1.12E-02	7846
PPARD	rs2267665	A	G	0.17	1.18	2.39E-01	1600	2.12	3.44E-02	2693	0.91	3.64E-01	1544	0.71	4.75E-01	2020	2.54	1.13E-02	7857
ABCA1	rs4149338	A	G	0.29	1.46	1.44E-01	1600	2.10	3.56E-02	2693	-0.36	7.16E-01	1544	1.58	1.13E-01	2020	2.53	1.14E-02	7857
ABCA1	rs2487042	A	G	0.22	1.25	2.11E-01	1595	1.85	6.47E-02	2692	0.24	8.11E-01	1515	1.52	1.29E-01	2019	2.53	1.16E-02	7821
NFKB1	rs1599961	A	G	0.38	2.32	2.05E-02	1600	1.03	3.01E-01	2693	-0.29	7.72E-01	1539	1.97	4.88E-02	2020	2.52	1.17E-02	7852
LRP1	rs1466535	A	G	0.32	-0.82	4.10E-01	1600	-2.13	3.35E-02	2693	-0.73	4.63E-01	1544	-1.14	2.54E-01	2020	-2.52	1.17E-02	7857
RXRA	rs3132300	A	G	0.21	-1.02	3.08E-01	1599	-2.10	3.61E-02	2693	-1.05	2.94E-01	1543	-0.72	4.70E-01	2020	-2.52	1.18E-02	7855
ABCA1	rs2740483	C	G	0.28	-1.09	2.77E-01	1600	-1.59	1.12E-01	2688	-0.92	3.59E-01	1542	-1.35	1.77E-01	2020	-2.51	1.20E-02	7850
ABCA1	rs1883023	A	G	0.30	-1.21	2.25E-01	1600	-2.85	4.40E-03	2693	-0.35	7.29E-01	1543	-0.28	7.78E-01	2020	-2.51	1.20E-02	7856
PAFAH1B1	rs8082331	G	A	0.04	0.45	6.55E-01	1600	2.14	3.23E-02	2692	1.60	1.11E-01	1542	0.68	4.93E-01	2020	2.51	1.21E-02	7854
PON1/2/3/4	rs854568	G	A	0.25	2.97	2.97E-03	1600	1.09	2.74E-01	2693	0.33	7.44E-01	1543	0.74	4.58E-01	2020	2.50	1.23E-02	7856
LIPG	rs12966382	A	G	0.15	2.59	9.51E-03	1600	0.11	9.09E-01	2693	0.06	9.49E-01	1542	2.41	1.59E-02	2018	2.49	1.29E-02	7853
HDLBP	rs1064767	G	A	0.17	-0.35	7.26E-01	1600	-1.78	7.51E-02	2693	-1.27	2.05E-01	1535	-1.42	1.55E-01	2019	-2.48	1.30E-02	7847
LRP1	rs4759044	G	A	0.44	0.14	8.88E-01	1600	-2.58	9.89E-03	2687	-1.49	1.36E-01	1541	-0.72	4.70E-01	2020	-2.47	1.34E-02	7848
PCSK5	rs11144706	A	T	0.08	-1.71	8.76E-02	1600	-1.35	1.77E-01	2693	-1.19	2.34E-01	1543	-0.74	4.60E-01	2020	-2.46	1.38E-02	7856
APOA1/A4/A5/C3	rs34003087	A	G	0.05	0.82	4.14E-01	1599	0.08	9.39E-01	2692	1.32	1.87E-01	1544	2.87	4.13E-03	2020	2.45	1.42E-02	7855
LIPC	rs17301822	A	G	0.03	1.65	9.83E-02	1600	0.88	3.80E-01	2693	0.12	9.02E-01	1544	2.24	2.52E-02	2020	2.45	1.43E-02	7857
LPL	rs4922115	A	G	0.15	1.26	2.09E-01	1596	1.12	2.63E-01	2651	1.64	1.02E-01	1335	1.00	3.15E-01	1997	2.44	1.47E-02	7579

NFKB1	rs747559	G	A	0.39	1.96	5.03E-02	1600	1.19	2.36E-01	2693	-0.30	7.64E-01	1539	1.95	5.08E-02	2019	2.44	1.48E-02	7851
SCARB1	rs10773105	G	A	0.47	3.92	9.03E-05	1599	0.67	5.02E-01	2693	-0.45	6.52E-01	1534	0.93	3.54E-01	2020	2.43	1.50E-02	7846
MMAB/MVK	rs11067394	G	A	0.22	1.74	8.21E-02	1600	1.31	1.89E-01	2693	0.70	4.87E-01	1542	1.12	2.63E-01	2020	2.43	1.51E-02	7855
ABCB11	rs853789	A	G	0.31	-0.25	8.06E-01	1599	1.77	7.61E-02	2693	0.44	6.59E-01	1538	2.57	1.01E-02	2020	2.43	1.52E-02	7850
ABCA1	rs4149269	G	A	0.39	-1.64	1.01E-01	1600	-1.37	1.72E-01	2662	-0.37	7.09E-01	1544	-1.42	1.56E-01	2020	-2.42	1.54E-02	7826
NFKB1	rs980455	G	A	0.39	1.93	5.41E-02	1600	1.25	2.13E-01	2693	-0.33	7.41E-01	1538	1.91	5.62E-02	2019	2.42	1.55E-02	7850
TAP2	rs9357155	A	G	0.10	0.81	4.16E-01	1599	1.09	2.78E-01	2693	1.25	2.13E-01	1541	1.71	8.77E-02	2020	2.42	1.55E-02	7853
PCSK6	rs1871975	G	A	0.43	1.08	2.79E-01	1600	0.36	7.15E-01	2692	2.57	1.03E-02	1544	1.14	2.53E-01	2020	2.42	1.56E-02	7856
PCSK5	rs1856508	A	C	0.09	2.29	2.23E-02	1598	1.01	3.12E-01	2690	1.33	1.83E-01	1537	0.40	6.86E-01	2020	2.42	1.56E-02	7845
APOE/C1/C2	rs12709889	A	G	0.27	0.84	4.02E-01	1590	0.40	6.92E-01	2660	2.60	9.39E-03	1498	1.30	1.95E-01	2007	2.41	1.58E-02	7755
CETP	rs12720917	G	A	0.14	1.96	5.05E-02	1600	0.93	3.50E-01	2693	0.24	8.12E-01	1543	1.73	8.36E-02	2020	2.41	1.59E-02	7856
LIPC	rs11852861	A	G	0.40	0.21	8.32E-01	1600	0.94	3.50E-01	2693	1.25	2.11E-01	1543	2.39	1.70E-02	2020	2.41	1.61E-02	7856
CETP	rs1800776	A	C	0.07	-1.63	1.03E-01	1600	0.29	7.70E-01	2693	-2.10	3.57E-02	1544	-1.79	7.37E-02	2020	-2.40	1.63E-02	7857
ABCB11	rs569805	T	A	0.32	-0.76	4.46E-01	1600	2.20	2.77E-02	2693	0.50	6.15E-01	1543	2.43	1.50E-02	2020	2.40	1.63E-02	7856
LIPG	rs3744843	G	A	0.06	1.26	2.07E-01	1598	1.09	2.76E-01	2691	1.55	1.20E-01	1541	0.99	3.24E-01	2020	2.40	1.66E-02	7850
APOB	rs693	A	G	0.46	-1.86	6.32E-02	1600	-0.58	5.62E-01	2693	-2.14	3.30E-02	1542	-0.53	5.99E-01	2019	-2.39	1.68E-02	7854
ABCB11	rs484066	T	A	0.37	-0.38	7.06E-01	1600	1.90	5.78E-02	2692	0.52	6.01E-01	1543	2.38	1.71E-02	2019	2.38	1.73E-02	7854
ABCB11	rs3770603	A	G	0.09	-1.33	1.84E-01	1600	-1.79	7.33E-02	2693	-0.21	8.37E-01	1543	-1.26	2.07E-01	2020	-2.38	1.74E-02	7856
NR5A2	rs2821369	A	G	0.09	0.17	8.64E-01	1600	-2.45	1.42E-02	2692	-1.56	1.18E-01	1543	-0.64	5.22E-01	2020	-2.38	1.75E-02	7855
SCARB1	rs4765180	A	G	0.48	2.53	1.13E-02	1596	1.27	2.05E-01	2691	0.80	4.25E-01	1541	0.26	7.93E-01	2015	2.37	1.77E-02	7843
ABCG1	rs7277991	A	C	0.35	-0.69	4.89E-01	1600	-1.23	2.20E-01	2693	-0.51	6.09E-01	1543	-2.20	2.81E-02	2020	-2.37	1.77E-02	7856
ATP5B	rs1465081	A	G	0.26	0.25	8.01E-01	1600	-2.32	2.03E-02	2690	-2.36	1.85E-02	1541	-0.15	8.78E-01	2020	-2.37	1.80E-02	7851
LIPC	rs10518976	A	T	0.08	1.04	2.97E-01	1600	0.22	8.28E-01	2693	2.20	2.83E-02	1544	1.57	1.17E-01	2020	2.37	1.80E-02	7857
PCSK5	rs2789608	G	C	0.39	2.45	1.42E-02	1599	2.63	8.58E-03	2693	0.93	3.54E-01	1543	-1.36	1.73E-01	2020	2.37	1.80E-02	7855
ABCA1	rs4149272	A	G	0.41	-1.36	1.74E-01	1600	-1.16	2.48E-01	2693	-0.69	4.89E-01	1544	-1.51	1.31E-01	2020	-2.36	1.82E-02	7857
HDLBP	rs15129	G	A	0.18	-0.51	6.10E-01	1598	-1.72	8.50E-02	2690	-1.27	2.06E-01	1544	-1.11	2.68E-01	2020	-2.36	1.82E-02	7852
PON1/2/3/4	rs10487132	G	A	0.39	-0.12	9.01E-01	1575	0.65	5.13E-01	2675	-2.62	8.96E-03	1490	-3.03	2.47E-03	2019	-2.36	1.82E-02	7759

NFKB1	rs4648133	G	A	0.29	2.01	4.45E-02	1600	0.97	3.31E-01	2693	0.00	9.99E-01	1544	1.73	8.33E-02	2020	2.36	1.85E-02	7857
LPL	rs249	G	A	0.08	0.31	7.59E-01	1600	0.92	3.60E-01	2691	1.93	5.39E-02	1542	1.63	1.04E-01	2020	2.35	1.86E-02	7853
PCSK5	rs2777020	G	A	0.23	1.98	4.82E-02	1600	1.13	2.58E-01	2693	0.38	7.02E-01	1544	1.23	2.20E-01	2020	2.35	1.90E-02	7857
LIPC	rs12912415	G	A	0.13	-1.47	1.42E-01	1600	-0.48	6.31E-01	2693	-2.39	1.68E-02	1542	-0.67	5.02E-01	2020	-2.34	1.91E-02	7855
PCSK5	rs11144672	A	T	0.04	1.77	7.64E-02	1600	1.68	9.33E-02	2692	0.44	6.59E-01	1544	0.72	4.74E-01	2019	2.34	1.92E-02	7855
ABCB11	rs853787	C	A	0.31	-0.16	8.73E-01	1600	1.68	9.26E-02	2692	0.42	6.78E-01	1544	2.45	1.43E-02	2016	2.34	1.94E-02	7852
APOA1/A4/A5/C3	rs619054	A	G	0.23	1.94	5.27E-02	1586	2.06	3.94E-02	2676	-0.13	8.96E-01	1523	0.60	5.51E-01	2018	2.33	2.01E-02	7803
LIPC	rs4238330	A	G	0.06	1.32	1.88E-01	1600	1.51	1.31E-01	2693	-0.33	7.41E-01	1544	1.95	5.11E-02	2020	2.32	2.03E-02	7857
PON1/2/3/4	rs6978425	C	A	0.34	2.08	3.79E-02	1599	0.84	4.00E-01	2688	1.50	1.34E-01	1542	0.45	6.54E-01	2019	2.32	2.03E-02	7848
SCARB1	rs7977729	G	A	0.26	-0.68	4.96E-01	1600	-0.38	7.01E-01	2693	-4.01	6.34E-05	1543	-0.03	9.79E-01	2019	-2.32	2.04E-02	7855
PDZK1	rs12129861	A	G	0.45	0.48	6.33E-01	1590	1.41	1.59E-01	2684	0.95	3.40E-01	1531	1.65	9.92E-02	2014	2.30	2.14E-02	7819
MMAB/MVK	rs11067376	G	A	0.41	0.94	3.48E-01	1599	1.12	2.65E-01	2693	1.89	5.89E-02	1534	0.76	4.49E-01	2020	2.30	2.17E-02	7846
SORCS1	rs7897974	A	G	0.45	2.80	5.06E-03	1600	0.79	4.31E-01	2691	1.13	2.60E-01	1542	0.13	8.93E-01	2020	2.29	2.18E-02	7853
ABCA1	rs4149273	G	A	0.41	-1.21	2.25E-01	1600	-1.15	2.53E-01	2693	-0.69	4.89E-01	1544	-1.51	1.31E-01	2020	-2.29	2.21E-02	7857
LIPG	rs11875600	G	A	0.09	1.36	1.73E-01	1600	1.64	1.01E-01	2692	0.62	5.38E-01	1528	0.87	3.86E-01	2019	2.29	2.21E-02	7839
TRIB1	rs17321515	G	A	0.47	0.74	4.62E-01	1600	1.56	1.18E-01	2693	2.43	1.52E-02	1544	-0.07	9.46E-01	2020	2.29	2.21E-02	7857
ABCA1	rs3780542	A	G	0.08	2.16	3.08E-02	1600	0.32	7.47E-01	2693	1.03	3.05E-01	1536	1.32	1.88E-01	2018	2.29	2.22E-02	7847
SORCS1	rs11193154	A	G	0.06	0.42	6.74E-01	1600	-2.20	2.80E-02	2693	0.76	4.46E-01	1544	-3.00	2.70E-03	2020	-2.28	2.26E-02	7857
PDZK1	rs1471633	C	A	0.49	-0.12	9.02E-01	1582	1.45	1.47E-01	2677	2.04	4.19E-02	1517	1.13	2.60E-01	2016	2.27	2.35E-02	7792
ABCB11	rs853778	A	G	0.46	-0.57	5.69E-01	1600	1.09	2.77E-01	2693	-0.10	9.21E-01	1544	3.81	1.41E-04	2020	2.27	2.35E-02	7857
LPL	rs316	A	C	0.14	1.80	7.19E-02	1600	1.60	1.11E-01	2692	-0.24	8.12E-01	1544	1.23	2.18E-01	2020	2.26	2.36E-02	7856
APOA1/A4/A5/C3	rs675	T	A	0.19	0.91	3.65E-01	1600	0.81	4.18E-01	2693	1.46	1.44E-01	1541	1.44	1.49E-01	2020	2.26	2.36E-02	7854
PCSK5	rs6560478	G	C	0.36	-0.77	4.44E-01	1600	-1.61	1.08E-01	2692	-0.72	4.72E-01	1277	-1.27	2.02E-01	2019	-2.26	2.37E-02	7588
NFKB1	rs11733293	A	G	0.31	1.76	7.85E-02	1598	1.05	2.96E-01	2690	0.57	5.66E-01	1529	1.17	2.41E-01	2017	2.26	2.41E-02	7834
NR5A2	rs3762399	A	C	0.10	0.56	5.78E-01	1600	-2.65	8.01E-03	2692	-1.78	7.54E-02	1544	-0.32	7.49E-01	2018	-2.25	2.43E-02	7854
ABCA1	rs2740476	G	C	0.24	-0.78	4.33E-01	1600	-1.92	5.54E-02	2693	-0.94	3.46E-01	1544	-0.71	4.81E-01	2020	-2.25	2.44E-02	7857
APOA1/A4/A5/C3	rs689243	G	C	0.42	2.51	1.22E-02	1600	2.25	2.43E-02	2693	0.03	9.79E-01	1541	-0.42	6.78E-01	2020	2.25	2.44E-02	7854

LPL	rs4921683	A	T	0.16	1.25	2.13E-01	1599	1.34	1.80E-01	2682	0.74	4.60E-01	1539	1.12	2.61E-01	2019	2.25	2.48E-02	7839
APOA1/A4/A5/C3	rs2266788	G	A	0.07	-0.33	7.38E-01	1600	-1.08	2.78E-01	2690	-1.46	1.46E-01	1526	-1.60	1.10E-01	2020	-2.24	2.51E-02	7836
PCSK5	rs1023181	G	A	0.29	2.24	2.54E-02	1600	0.15	8.83E-01	2693	0.51	6.12E-01	1541	1.81	6.97E-02	2020	2.24	2.51E-02	7854
ABCG5	rs1864814	A	G	0.04	1.98	4.82E-02	1600	1.44	1.51E-01	2693	1.62	1.05E-01	1544	-0.42	6.71E-01	2020	2.24	2.53E-02	7857
ABCA1	rs2065412	G	A	0.37	-2.00	4.52E-02	1600	-0.78	4.35E-01	2693	-0.79	4.27E-01	1543	-1.03	3.03E-01	2020	-2.24	2.55E-02	7856
HNF4A	rs717248	G	A	0.05	0.83	4.05E-01	1600	3.13	1.75E-03	2693	0.72	4.74E-01	1544	-0.58	5.63E-01	2020	2.23	2.56E-02	7857
LPL	rs11570892	G	A	0.17	1.26	2.08E-01	1600	1.29	1.97E-01	2693	0.75	4.55E-01	1544	1.14	2.55E-01	2020	2.23	2.57E-02	7857
PCSK5	rs10781328	A	G	0.10	-1.82	6.88E-02	1597	-2.02	4.34E-02	2687	0.29	7.71E-01	1532	-0.67	5.01E-01	2018	-2.22	2.66E-02	7834
LPL	rs1059507	A	G	0.16	1.23	2.18E-01	1600	1.24	2.17E-01	2692	0.81	4.20E-01	1543	1.14	2.55E-01	2020	2.21	2.69E-02	7855
NFKB1	rs4698860	G	A	0.31	1.74	8.24E-02	1600	1.03	3.02E-01	2693	0.53	5.93E-01	1540	1.15	2.52E-01	2020	2.21	2.73E-02	7853
LIPC	rs4775046	A	G	0.49	-1.33	1.84E-01	1600	-0.76	4.50E-01	2693	-0.48	6.32E-01	1541	-1.87	6.15E-02	2019	-2.20	2.76E-02	7853
RXRA	rs4842198	A	G	0.25	-1.62	1.06E-01	1569	-0.49	6.27E-01	2654	-1.14	2.57E-01	1378	-1.36	1.75E-01	2014	-2.20	2.77E-02	7615
CETP	rs1801706	A	G	0.17	3.36	7.73E-04	1600	-0.50	6.20E-01	2693	0.67	5.06E-01	1544	1.32	1.87E-01	2019	2.19	2.84E-02	7856
FADS1/2/3	rs509360	A	G	0.38	-0.39	6.97E-01	1600	1.57	1.16E-01	2693	0.47	6.38E-01	1541	2.44	1.47E-02	2020	2.19	2.86E-02	7854
NFKB1	rs4698862	G	A	0.31	1.65	9.95E-02	1599	1.03	3.04E-01	2692	0.54	5.91E-01	1540	1.19	2.36E-01	2018	2.19	2.89E-02	7849
LIPC	rs8028759	G	A	0.35	2.02	4.38E-02	1600	-0.06	9.54E-01	2693	1.80	7.17E-02	1543	1.00	3.16E-01	2020	2.18	2.91E-02	7856
PON1/2/3/4	rs2375005	T	A	0.46	-0.63	5.26E-01	1600	-0.22	8.29E-01	2693	3.00	2.73E-03	1540	2.50	1.25E-02	2019	2.18	2.92E-02	7852
PCSK6	rs4965836	G	C	0.09	-0.24	8.13E-01	1599	-1.04	2.99E-01	2692	-1.30	1.93E-01	1543	-1.75	8.06E-02	2020	-2.18	2.94E-02	7854
SCARB1	rs838896	C	G	0.33	-0.44	6.57E-01	1598	-0.56	5.75E-01	2688	-4.55	5.89E-06	1537	0.70	4.81E-01	2020	-2.18	2.95E-02	7843
LRP1	rs4759277	A	C	0.35	-0.48	6.32E-01	1600	-1.79	7.31E-02	2693	-0.85	3.97E-01	1544	-1.05	2.94E-01	2019	-2.17	2.98E-02	7856
ABCB11	rs494874	A	G	0.31	-0.81	4.17E-01	1600	2.02	4.36E-02	2688	0.60	5.49E-01	1540	2.15	3.16E-02	2019	2.17	3.00E-02	7847
MMAB/MVK	rs10850432	A	G	0.03	-1.32	1.88E-01	1600	-1.27	2.06E-01	2693	-0.92	3.58E-01	1543	-0.84	4.02E-01	2020	-2.17	3.02E-02	7856
PCSK5	rs2066185	C	G	0.46	-1.76	7.89E-02	1600	-1.14	2.54E-01	2693	-0.54	5.90E-01	1542	-0.92	3.58E-01	2020	-2.17	3.03E-02	7855
TAP2	rs4148871	A	G	0.20	-0.86	3.90E-01	1600	-1.25	2.10E-01	2693	-0.93	3.51E-01	1536	-1.24	2.16E-01	2018	-2.16	3.06E-02	7847
NFKB1	rs4698863	A	G	0.31	1.64	1.02E-01	1600	1.01	3.13E-01	2693	0.53	5.95E-01	1543	1.17	2.43E-01	2018	2.16	3.10E-02	7854
SCARB1	rs12819677	A	G	0.45	-3.45	5.68E-04	1600	-0.99	3.22E-01	2693	0.93	3.51E-01	1538	-0.85	3.96E-01	2019	-2.15	3.13E-02	7850
APOE/C1/C2	rs769450	A	G	0.40	1.51	1.32E-01	1599	2.48	1.31E-02	2689	-0.18	8.59E-01	1544	0.20	8.44E-01	2020	2.15	3.13E-02	7852

ABCA1	rs10115928	A	G	0.42	-1.51	1.31E-01	1598	-0.98	3.29E-01	2693	-0.19	8.48E-01	1542	-1.60	1.09E-01	2020	-2.15	3.15E-02	7853
PAFAH1B2	rs12291885	G	A	0.04	1.38	1.67E-01	1600	2.10	3.56E-02	2675	1.04	2.98E-01	1544	-0.35	7.24E-01	2018	2.14	3.28E-02	7837
ABCA1	rs2575875	A	G	0.42	-1.45	1.47E-01	1600	-0.91	3.65E-01	2693	-0.04	9.68E-01	1543	-1.82	6.92E-02	2019	-2.13	3.36E-02	7855
SCARB1	rs838893	A	G	0.31	-0.33	7.39E-01	1600	-0.66	5.12E-01	2693	-3.95	8.32E-05	1538	0.30	7.65E-01	2020	-2.13	3.36E-02	7851
LIPC	rs17269264	A	G	0.47	-1.23	2.19E-01	1600	-0.88	3.79E-01	2693	-0.46	6.48E-01	1543	1.68	9.29E-02	2020	-2.12	3.37E-02	7856
PCSK5	rs2275406	A	G	0.10	-1.82	6.86E-02	1596	-1.84	6.63E-02	2693	-0.07	9.41E-01	1537	-0.38	7.03E-01	2020	-2.12	3.37E-02	7846
LPL	rs270	A	C	0.14	-1.31	1.91E-01	1600	-0.89	3.76E-01	2693	-0.31	7.56E-01	1540	-1.71	8.70E-02	2020	-2.11	3.45E-02	7853
PLTP	rs6065904	A	G	0.22	-2.33	2.00E-02	1599	-0.29	7.72E-01	2693	0.14	8.90E-01	1542	-1.88	5.97E-02	2020	-2.11	3.46E-02	7854
PLTP	rs4810479	G	A	0.27	-2.14	3.22E-02	1599	-0.16	8.73E-01	2693	0.47	6.39E-01	1543	-2.48	1.33E-02	2018	-2.11	3.51E-02	7853
PCSK6	rs2220055	A	G	0.10	-0.25	8.02E-01	1600	-0.50	6.16E-01	2693	-1.62	1.05E-01	1541	-1.93	5.32E-02	2020	-2.11	3.52E-02	7854
NFKB1	rs230542	A	G	0.32	1.50	1.33E-01	1600	0.58	5.60E-01	2693	0.26	7.96E-01	1537	1.89	5.87E-02	2020	2.09	3.63E-02	7850
APOA1/A4/A5/C3	rs12099358	A	C	0.18	1.24	2.14E-01	1600	1.99	4.62E-02	2693	0.79	4.30E-01	1544	0.03	9.78E-01	2020	2.09	3.65E-02	7857
LIPC	rs11853726	G	A	0.41	-0.14	8.92E-01	1600	2.60	9.30E-03	2690	-0.01	9.95E-01	1544	1.25	2.11E-01	2008	2.09	3.65E-02	7842
ABCA1	rs10120087	A	C	0.13	1.27	2.04E-01	1600	0.87	3.83E-01	2693	1.48	1.39E-01	1544	0.69	4.91E-01	2020	2.09	3.66E-02	7857
PPARD	rs9658085	G	A	0.08	1.65	9.89E-02	1600	1.96	5.07E-02	2693	0.98	3.25E-01	1543	-0.47	6.40E-01	2020	2.09	3.68E-02	7856
PAFAH1B2	rs10790175	A	G	0.29	2.69	7.22E-03	1600	2.26	2.38E-02	2693	-0.75	4.51E-01	1540	-0.23	8.19E-01	2020	2.09	3.70E-02	7853
PPARD	rs4713854	C	A	0.09	1.37	1.72E-01	1600	2.98	2.94E-03	2692	-1.04	2.99E-01	1541	0.36	7.16E-01	2020	2.08	3.74E-02	7853
NFKB1	rs17033014	G	A	0.31	1.75	8.04E-02	1600	0.98	3.28E-01	2693	0.46	6.48E-01	1543	0.98	3.29E-01	2018	2.06	3.95E-02	7854
PAFAH1B2	rs4938349	G	A	0.29	2.69	7.06E-03	1599	2.11	3.47E-02	2693	-0.68	4.98E-01	1539	-0.19	8.51E-01	2020	2.06	3.97E-02	7851
NFKB1	rs4698861	G	A	0.31	1.94	5.25E-02	1600	0.73	4.63E-01	2693	0.44	6.57E-01	1539	1.09	2.75E-01	2020	2.06	3.98E-02	7852
SCARB1	rs7134858	A	G	0.08	1.27	2.06E-01	1600	1.12	2.64E-01	2693	1.93	5.41E-02	1544	-0.05	9.63E-01	2019	2.06	3.98E-02	7856
CUBN	rs10904881	A	C	0.41	0.29	7.71E-01	1595	-1.20	2.31E-01	2690	-0.81	4.18E-01	1514	-2.21	2.72E-02	2020	-2.05	4.04E-02	7819
APOE/C1/C2	rs7257468	A	G	0.47	0.22	8.27E-01	1595	0.83	4.07E-01	2686	1.19	2.35E-01	1528	1.84	6.51E-02	2013	2.05	4.08E-02	7822
DGAT1	rs7827865	A	C	0.10	-2.05	4.05E-02	1600	-1.34	1.80E-01	2690	-1.22	2.23E-01	1537	0.40	6.87E-01	2020	-2.05	4.09E-02	7847
APOA2	rs4073054	C	A	0.37	-1.39	1.66E-01	1600	-1.56	1.19E-01	2693	-0.09	9.25E-01	1544	-0.91	3.64E-01	2020	-2.04	4.12E-02	7857
PCSK5	rs4552981	A	T	0.46	2.55	1.09E-02	1600	1.33	1.82E-01	2693	0.56	5.74E-01	1544	-0.27	7.84E-01	2019	2.04	4.13E-02	7856
FAS	rs9658742	G	C	0.47	-0.61	5.44E-01	1581	-0.80	4.22E-01	2625	-2.29	2.24E-02	1526	-0.56	5.78E-01	2012	-2.04	4.14E-02	7744

LRP2	rs1003456	T	A	0.20	0.67	5.02E-01	1600	1.31	1.91E-01	2693	-0.38	7.02E-01	1542	2.25	2.46E-02	2020	2.04	4.15E-02	7855
ABCA1	rs2515617	A	G	0.43	0.54	5.86E-01	1599	-0.90	3.67E-01	2693	-1.80	7.16E-02	1543	-1.88	6.00E-02	2020	-2.03	4.19E-02	7855
ABCB11	rs552976	A	G	0.34	-0.88	3.78E-01	1600	1.96	4.96E-02	2693	0.45	6.51E-01	1544	2.13	3.28E-02	2020	2.03	4.19E-02	7857
LPL	rs281	T	A	0.29	-0.51	6.12E-01	1595	-1.41	1.60E-01	2690	-0.47	6.37E-01	1522	-1.52	1.29E-01	2018	-2.03	4.21E-02	7825
PPARD	rs3734254	G	A	0.26	1.58	1.15E-01	1574	1.79	7.30E-02	2671	-0.40	6.87E-01	1537	0.89	3.73E-01	2019	2.03	4.22E-02	7801
NFKB1	rs11733749	C	A	0.32	1.35	1.77E-01	1574	1.02	3.08E-01	2656	0.44	6.64E-01	1513	1.24	2.14E-01	2017	2.03	4.24E-02	7760
LIPC	rs934296	G	A	0.04	2.35	1.86E-02	1583	0.13	9.00E-01	2665	0.40	6.89E-01	1513	1.41	1.59E-01	2019	2.03	4.24E-02	7780
TRIB1	rs6982636	A	G	0.45	0.68	4.94E-01	1598	1.44	1.50E-01	2689	2.05	4.11E-02	1532	-0.05	9.58E-01	2020	2.03	4.26E-02	7839
ABCA1	rs1831554	A	G	0.06	1.03	3.04E-01	1599	0.45	6.54E-01	2693	1.04	2.98E-01	1543	1.64	1.01E-01	2020	2.02	4.34E-02	7855
CUBN	rs3740163	T	A	0.02	1.79	7.42E-02	1600	0.70	4.84E-01	2692	1.93	5.44E-02	1544	-0.10	9.18E-01	2020	2.02	4.37E-02	7856
APOA1/A4/A5/C3	rs4417316	A	G	0.09	1.58	1.14E-01	1600	1.92	5.54E-02	2693	1.78	7.46E-02	1544	-1.21	2.26E-01	2020	2.01	4.43E-02	7857
NFKB1	rs230532	A	T	0.32	1.78	7.49E-02	1599	0.28	7.80E-01	2692	0.22	8.24E-01	1538	1.86	6.25E-02	2020	2.01	4.43E-02	7849
CUBN	rs5015063	C	A	0.09	0.76	4.45E-01	1599	1.28	1.99E-01	2693	2.35	1.87E-02	1544	-0.25	8.00E-01	2020	2.01	4.44E-02	7856
LCAT	rs7200210	G	A	0.08	0.99	3.23E-01	1600	-2.56	1.04E-02	2693	-1.05	2.94E-01	1544	-0.96	3.36E-01	2019	-2.01	4.48E-02	7856
LPL	rs9644636	C	A	0.29	-0.44	6.60E-01	1593	-0.93	3.54E-01	2687	-1.48	1.39E-01	1537	-1.20	2.30E-01	2020	-2.01	4.49E-02	7837
ABCG1	rs225443	A	G	0.38	0.16	8.72E-01	1600	1.82	6.97E-02	2693	1.35	1.79E-01	1544	0.53	5.95E-01	2020	2.00	4.55E-02	7857
ABCB11	rs2544367	A	G	0.46	-0.35	7.28E-01	1585	0.80	4.23E-01	2673	-0.65	5.18E-01	1504	3.87	1.11E-04	2016	2.00	4.59E-02	7778
APOE/C1/C2	rs439401	A	G	0.37	2.04	4.16E-02	1578	1.39	1.65E-01	2638	0.97	3.30E-01	1510	-0.33	7.44E-01	2020	1.99	4.62E-02	7746
RXRA	rs7853153	A	G	0.04	2.19	2.89E-02	1600	2.07	3.89E-02	2691	-0.24	8.11E-01	1541	-0.19	8.49E-01	2020	1.99	4.63E-02	7852
PCSK5	rs10781325	C	A	0.33	-0.47	6.37E-01	1600	-1.19	2.33E-01	2693	-1.32	1.89E-01	1544	-0.97	3.32E-01	2020	-1.99	4.69E-02	7857
PPARA	rs5766741	G	A	0.28	-1.16	2.45E-01	1600	2.20	2.80E-02	2692	1.85	6.45E-02	1542	0.79	4.27E-01	2020	1.98	4.73E-02	7854
LIPC	rs1869138	G	A	0.09	0.73	4.66E-01	1600	0.03	9.79E-01	2691	1.41	1.59E-01	1541	1.99	4.65E-02	2020	1.98	4.80E-02	7852
ABCB11	rs853779	C	A	0.47	-0.45	6.53E-01	1600	0.98	3.27E-01	2693	-0.40	6.90E-01	1544	3.52	4.38E-04	2018	1.98	4.81E-02	7855
ABCA1	rs2777784	G	A	0.42	-1.24	2.16E-01	1600	-0.81	4.19E-01	2692	-0.07	9.46E-01	1540	-1.80	7.17E-02	2020	-1.98	4.82E-02	7852
LCAT	rs20549	G	A	0.22	0.81	4.16E-01	1600	-0.15	8.80E-01	2693	2.20	2.82E-02	1543	1.43	1.54E-01	2020	1.97	4.84E-02	7856
APOE/C1/C2	rs3760627	G	A	0.47	0.16	8.74E-01	1600	0.77	4.44E-01	2693	1.12	2.65E-01	1542	1.89	5.88E-02	2020	1.97	4.86E-02	7855
RXRA	rs11102986	A	G	0.18	-0.26	7.93E-01	1599	-1.96	4.98E-02	2692	-0.91	3.62E-01	1541	-0.59	5.56E-01	2020	-1.97	4.89E-02	7852

APOA1/A4/A5/C3	rs2075290	G	A	0.08	0.24	8.09E-01	1600	-1.11	2.66E-01	2693	-1.39	1.66E-01	1544	-1.60	1.09E-01	2019	-1.97	4.91E-02	7856

A, allele; MAF, Minor allele frequency from Penn-RC; T, T-statistic; P, P-value; Z, Z-statistic; N, Sample size

Supplemental Table 4. Nonsynonymous SNPs associated with HDL-C								
Locus	SNP	A1	A2	MAF	Z	P	N	AA Change
LPL	rs328	G	C	0.10	-6.68	2.45E-11	7857	S474X
CETP	rs1800777	A	G	0.03	-6.55	5.84E-11	7852	R468Q
CETP	rs5880	C	G	0.04	-6.54	6.24E-11	7857	A390P
CETP	rs5882	G	A	0.34	-4.78	1.76E-06	7855	V422I
LPL	rs268	G	A	0.01	4.55	5.38E-06	7855	N318S
LIPG	rs77960347	G	A	0.01	-4.22	2.48E-05	7857	N396S
APOA1/A4/A5/C3	rs12287066	A	C	0.08	-4.02	5.87E-05	7850	APOA5 I44M
APOB	rs1801695	A	G	0.03	3.95	7.80E-05	7857	A4481T
PON1/2/3/4	rs7493	G	C	0.24	-3.46	5.42E-04	7855	PON2 S311C
PON1/2/3/4	rs12026	C	G	0.24	3.45	5.72E-04	7854	PON2 A148G
APOB	rs1801699	G	A	0.02	3.12	1.80E-03	7853	N1914S
APOE/C1/C2	rs5167	C	A	0.37	-3.10	1.94E-03	7855	APOC4 L96R
APOB	rs676210	A	G	0.21	3.09	1.97E-03	7856	P2739R
PON1/2/3/4	rs13226149	A	G	0.27	2.92	3.50E-03	7851	PON3 F21L
APOB	rs1042034	G	A	0.21	-2.91	3.65E-03	7854	S4338N
LRP2	rs34291900	A	G	0.03	-2.75	5.95E-03	7857	G669D
ABCA1	rs2230808	A	G	0.30	-2.69	7.17E-03	7856	K1587R
ABCA1	rs4149313	G	A	0.17	-2.55	1.07E-02	7856	I883M

APOA1/A4/A5/C3	rs675	T	A	0.19	-2.26	2.36E-02	7854	APOA4 T367S
A, allele; MAF, Minor allele frequency from Penn-RC; T, T-statistic; P, P-value; Z, Z-statistic; N, Sample size								

Supplemental Table 5. Replication of Prior Confirmed Loci

				Penn-CC		Penn-RC		MONICA/KORA		GRAPHIC		Meta-analysis			
Gene	SNP	Proxy	R^2	*P*	N	*P*	N	*P*	N	*P*	N	*P*	N	D	Reference
ABCA1	rs1883025			1.41E-02	1599	1.71E-01	2693	3.94E-01	1544	8.86E-03	2020	3.02E-04	7856	-	22, 24
ABCA1	rs3905000	rs3890182	1	5.27E-02	1600	3.75E-01	2692	1.21E-02	1543	8.56E-02	2020	7.33E-04	7855	-	34
ABCA1	rs3890182			5.27E-02	1600	3.75E-01	2692	1.21E-02	1543	8.56E-02	2020	7.33E-04	7855	-	21
ABCA1	rs4149268	rs4149269	1	1.01E-01	1600	1.72E-01	2662	7.09E-01	1544	1.56E-01	2020	1.54E-02	7826	+	9
ABCA1	rs11789603			8.60E-01	1600	6.48E-01	2693	2.29E-02	1544	3.47E-01	2020	6.69E-02	7857	+	24
ABCA1	rs2515614	rs2472509	1	9.60E-01	1600	1.79E-01	2693	3.72E-01	1539	9.82E-01	2020	2.51E-01	7852	+/-	23
ANGPTL4	rs7255436	rs2278236	1	2.42E-01	1600	4.54E-01	2693	1.38E-01	1544	9.93E-01	2020	1.05E-01	7857	+	24
ANGPTL4	rs2967605	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22
APOA1-C3-A4-A5	rs618923	rs619054	0.955	5.27E-02	1586	3.94E-02	2676	8.96E-01	1523	5.51E-01	2018	2.01E-02	7803	+	23
APOA1-C3-A4-A5	rs12225230			1.54E-01	1599	1.69E-01	2692	5.41E-01	1544	8.06E-01	2020	1.11E-01	7855	+	24
APOA1-C3-A4-A5	rs964184	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22, 24
APOA1-C3-A4-A5	rs28927680	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	21
APOB	rs1042034			6.56E-03	1600	4.61E-01	2692	8.43E-02	1542	3.40E-01	2020	3.65E-03	7854	-	24
APOB	rs6754295	rs1042034	0.857	6.56E-03	1600	4.61E-01	2692	8.43E-02	1542	3.40E-01	2020	3.65E-03	7854	-	34
APOE-C1-C2	rs5167			2.45E-01	1600	7.34E-01	2692	3.30E-03	1543	NA	NA	1.94E-03	7855	-	24
APOE-C1-C2	rs769449	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23
APOE-C1-C2	rs4420638	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
CETP	rs3764261			7.82E-14	1600	8.94E-10	2693	6.36E-12	1542	4.77E-15	2019	2.15E-44	7854	+	9, 24, 36, 37
CETP	rs173539	rs3764261	1	7.82E-14	1600	8.94E-10	2693	6.36E-12	1542	4.77E-15	2019	2.15E-44	7854	+	22
CETP	rs1800775			1.40E-14	1600	2.04E-08	2693	7.14E-09	1536	4.95E-11	2020	1.06E-36	7849	+	21, 24
CETP	rs1532624			2.03E-13	1600	3.68E-05	2693	8.81E-10	1543	2.43E-12	2020	3.50E-33	7856	+	34
CETP	rs1864163			1.66E-14	1598	3.05E-06	2692	2.48E-10	1541	1.32E-08	2020	1.47E-32	7851	-	9

CETP	rs9939224	rs7499892	1	8.01E-15	1600	1.10E-08	2693	2.18E-07	1542	2.36E-07	2018	5.62E-32	7853	-	24
CETP	rs9989419			NA	NA	4.45E-02	2070	NA	NA	NA	NA	4.45E-02	2070	-	9, 35
CETP	rs12596776	rs13306677	1	4.02E-01	1600	4.22E-01	2669	7.87E-01	1542	4.41E-01	2020	1.74E-01	7831	+	9
CETP	rs1566439	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9
CTCF-PRMT8	rs2271293	rs2292318	0.915	9.96E-01	1600	2.24E-01	2693	1.33E-02	1509	1.76E-02	2020	2.62E-03	7822	+	34
FADS1-2-3	rs174547	rs1535	1	1.34E-03	1600	5.41E-03	2693	4.18E-01	1537	3.49E-03	2020	8.78E-07	7850	+	22
FADS1-2-3	rs174601			8.12E-04	1599	3.44E-02	2689	4.26E-01	1543	7.34E-03	2020	8.11E-06	7851	-	24
GALNT2	rs2144300			3.90E-02	1600	2.02E-02	2692	6.64E-01	1542	2.37E-01	2020	2.05E-03	7854	+	9
GALNT2	rs4846914			3.90E-02	1600	2.23E-02	2691	7.19E-01	1541	2.35E-01	2019	2.44E-03	7851	+	21, 22, 24
GRIN3A	rs1323432			NA	NA	7.52E-01	2067	NA	NA	NA	NA	7.52E-01	2067	+	9
HNF4A	rs1800961			8.40E-02	1600	8.12E-01	2693	5.46E-01	1544	6.56E-02	2020	1.13E-01	7857	-	22, 24
KLHL8	rs442177	rs3775214	0.964	9.97E-01	1600	4.56E-01	2693	6.31E-01	1543	NA	NA	7.97E-01	5836	-/+	24
LCAT	rs2271293	rs2292318	0.915	9.96E-01	1600	2.24E-01	2693	1.33E-02	1509	1.76E-02	2020	2.62E-03	7822	+	22
LCAT	rs16942887	rs2292318	0.915	9.96E-01	1600	2.24E-01	2693	1.33E-02	1509	1.76E-02	2020	2.62E-03	7822	+	24
LCAT	rs255052			8.85E-01	1599	2.41E-01	2692	6.42E-02	1538	7.57E-03	2019	3.44E-03	7848	+	9
LCAT	rs255049	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	37
LILRA3	rs386000	rs103294	0.832	6.41E-02	1600	3.89E-02	2693	2.89E-01	1544	NA	NA	3.54E-03	5837	+	24
LIPC	rs2070895			9.35E-03	1600	1.18E-01	2693	5.16E-04	1541	1.50E-02	2020	1.17E-06	7854	+	24
LIPC	rs1800588			1.11E-02	1600	1.85E-01	2692	5.64E-04	1541	8.70E-03	2019	1.75E-06	7852	+	21, 23
LIPC	rs261332			9.11E-03	1600	1.82E-01	2692	4.16E-04	1544	1.34E-02	2019	1.79E-06	7855	+	9
LIPC	rs4775041			NA	NA	3.18E-02	2071	NA	NA	NA	NA	3.18E-02	2071	-	9
LIPC	rs10468017	rs4775041	0.84	NA	NA	3.18E-02	2071	NA	NA	NA	NA	3.18E-02	2071	-	22
LIPC	rs1532085	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24, 34, 36, 37
LIPG	rs2156552			4.80E-05	1600	2.16E-02	2693	3.40E-01	1543	7.48E-04	2020	1.09E-07	7856	-	9, 21
LIPG	rs4939883	rs2156552	0.948	4.80E-05	1600	2.16E-02	2693	3.40E-01	1543	7.48E-04	2020	1.09E-07	7856	-	34
LIPG	rs7241918	rs2156552	0.948	4.80E-05	1600	2.16E-02	2693	3.40E-01	1543	7.48E-04	2020	1.09E-07	7856	-	24

LIPG	rs7240405	rs2156552	0.948	4.80E-05	1600	2.16E-02	2693	3.40E-01	1543	7.48E-04	2020	1.09E-07	7856	-	35
LIPG	rs4939883	rs2156552	0.948	4.80E-05	1600	2.16E-02	2693	3.40E-01	1543	7.48E-04	2020	1.09E-07	7856	-	22, 23, 34
LIPG	rs2040293	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
LPA	rs1084651			1.57E-01	1600	7.67E-01	2693	7.09E-01	1541	7.19E-01	2020	4.27E-01	7854	-	24
LPL	rs12678919	rs12679834	0.861	3.32E-05	1598	1.83E-03	2691	2.10E-03	1538	1.28E-03	2013	2.18E-11	7840	-	22, 24
LPL	rs17482753	rs12679834	0.929	3.32E-05	1598	1.83E-03	2691	2.10E-03	1538	1.28E-03	2013	2.18E-11	7840	-	35
LPL	rs328			1.99E-05	1600	1.42E-03	2693	3.62E-03	1544	1.68E-03	2020	2.45E-11	7857	-	21
LPL	rs10503669	rs328	1	1.99E-05	1600	1.42E-03	2693	3.62E-03	1544	1.68E-03	2020	2.45E-11	7857	-	9
LPL	rs10096633	rs328	0.929	1.99E-05	1600	1.42E-03	2693	3.62E-03	1544	1.68E-03	2020	2.45E-11	7857	-	34
LPL	rs2083637	rs13702	0.913	1.25E-06	1599	1.58E-03	2693	2.43E-02	1543	2.62E-03	2020	5.34E-11	7855	-	34
LPL	rs331			2.20E-04	1600	1.04E-03	2693	4.48E-02	1539	6.45E-04	2020	5.40E-10	7852	+	23
LPL	rs7016529			7.56E-03	1600	1.12E-01	2693	3.13E-01	1543	2.94E-02	2020	2.27E-04	7856	+	24
LPL	rs2197089			8.26E-02	1592	1.96E-01	2681	1.17E-01	1534	2.62E-01	2019	5.05E-03	7826	+	9
LPL	rs6586891			NA	NA	5.89E-02	2064	NA	NA	NA	NA	5.89E-02	2064	+	9
LRP4	rs3136441	rs5896	1	7.10E-01	1600	3.41E-03	2692	9.56E-01	1541	NA	NA	3.12E-02	5833	+	24
MLXIPL	rs17145738			9.09E-01	1600	7.22E-02	2693	4.19E-02	1542	NA	NA	8.14E-01	5835	-	24
MVK/MMAB	rs7134594	rs2338104	0.935	5.02E-01	1600	4.54E-02	2693	2.74E-02	1543	8.77E-01	2019	5.42E-02	7855	-	24
MVK/MMAB	rs2338104			5.02E-01	1600	4.54E-02	2693	2.74E-02	1543	8.77E-01	2019	5.42E-02	7855	-	9, 22
NR1H3	rs7120118	rs1375688	0.913	5.21E-01	1600	3.12E-03	2692	6.25E-01	1539	6.96E-01	2020	1.08E-01	7851	+/-	37
PGS1	rs4129767	rs4082919	0.967	2.19E-01	1600	7.29E-01	2692	8.25E-01	1540	NA	NA	3.20E-01	5832	+	24
PLTP	rs7679	rs6073952	0.818	2.30E-01	1600	7.86E-01	2693	6.59E-01	1541	6.29E-02	2020	1.48E-01	7854	-	22
PLTP	rs6065906	rs6073952	0.877	2.30E-01	1600	7.86E-01	2693	6.59E-01	1541	6.29E-02	2020	1.48E-01	7854	-	23, 24
SCARB1	rs838880	rs838878	0.961	6.93E-02	1600	8.85E-02	2693	5.23E-02	1543	1.12E-01	2020	4.94E-04	7856	+	24
STARD3	rs881844			1.66E-01	1600	7.32E-01	2692	2.80E-02	1543	NA	NA	1.05E-01	5835	-/+	24
TRIB1	rs10808546	rs17321515	0.932	4.62E-01	1600	1.18E-01	2693	1.52E-02	1544	NA	NA	2.21E-02	7857	-	24
ZNF664	rs838880	rs838878	0.961	6.93E-02	1600	8.85E-02	2693	5.23E-02	1543	1.12E-01	2020	4.94E-04	7856	+	24
ZNF664	rs11057244	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24

ZNF664	rs4765127	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
ABCA8	rs4148008	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
AMPD3	rs2923084	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
ARL15	rs6450176	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
C6orf106	rs2814944	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
CITED2	rs605066	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
CMIP	rs2925979	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
COBLL1/GRB14	rs12328675	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
COBLL1/GRB14	rs10490694	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23
EVI5	rs531514	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
IRS1	rs2972146	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
KLF14	rs4731702	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
LACTB	rs2652834	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
LOC55908	rs737337	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
LRP1	rs3741414	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
MADD-FOLH1	rs7395662	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	34
MC4R	rs12967135	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
PABPC4	rs4660293	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
PDE3A	rs7134375	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
PPP1R3B	rs9987289	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
SBNO1	rs4759375	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
SLC39A8	rs13107325	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
TRPS1	rs2293889	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
TTC39B	rs471364	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22
TTC39B	rs643531	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
UBASH3B	rs7115089	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
UBE2L3	rs181362	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24

ZNF648	rs1689800	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	[24]
R^2, correlation coefficient; P, P-value; N, Sample size; D, Direction of effect															

Supplemental Figure Legends

Supplemental Figure 1. Inference of genetic race using multi-dimensional scaling approach. Analysis is conducted on 5051 samples genotyped using the IBC array.

Supplemental Figure 1.