OXFORD UNIVERSITY PRESS | Brain

Genetically determined blood lipids and cerebral small vessel disease: role of HDL cholesterol

Journal:	*Brain*
Manuscript ID	Draft
Manuscript Type:	Original Article
Date Submitted by the Author:	n/a
Complete List of Authors:	Georgakis, Marios; Ludwig-Maximilians-Universitat Munchen, Institute for Stroke and Dementia Research; Malik, Rainer; Institute for Stroke and Dementia Research Anderson, Christopher; Massachusetts General Hospital, Division of Neurocritical Care and Emergency Neurology, Department of Neurology; Massachusetts General Hospital, Center for Genomic Medicine Parhofer, Klaus; University Hospital of Ludwig-Maximilians-University (LMU), Department of Internal Medicine IV Hopewell, Jemma; University of Oxford Nuffield Department of Population Health, Clinical Trial Service Unit and Epidemiological Studies Unit Dichgans, Martin; Universität München, Institute for Stroke and Dementia Research; DZNE German Centre for Neurodegenerative Disease,
Subject category:	Genetics
To search keyword list, use whole or part words followed by an *:	GENETICS, Small vessel disease < CNS INJURY AND STROKE, Stroke: epidemiology < CNS INJURY AND STROKE, Cerebral haemorrhage < CNS INJURY AND STROKE, Lacunar stroke < CNS INJURY AND STROKE

Genetically determined blood lipids and cerebral small vessel disease: role of HDL cholesterol

Marios K. Georgakis, MD, MSc [1, 2], Rainer Malik, PhD [1], Christopher D. Anderson, MD, MMSc [3, 4, 5, 6], Klaus G. Parhofer, MD [7], Jemma C. Hopewell, PhD [8], Martin Dichgans, MD [1, 9, 10]

[1]Institute for Stroke and Dementia Research (ISD), University Hospital of Ludwig-Maximilians-University (LMU), Munich, Germany;

[2] Graduate School for Systemic Neurosciences (GSN), Ludwig-Maximilians-University (LMU), Munich, Germany;

[3] Center for Genomic Medicine, Massachusetts General Hospital, Boston, MA, USA;

[4] Division of Neurocritical Care and Emergency Neurology, Department of Neurology, Massachusetts General Hospital, Boston, MA, USA;

[5] Program in Medical and Population Genetics, Broad Institute, Cambridge, MA, USA;

[6] Henry and Allison McCance Center for Brain Health, Department of Neurology, Massachusetts General Hospital, Boston, MA, USA;

[7] Department of Internal Medicine IV, University Hospital of Ludwig-Maximilians-University (LMU), Munich, Germany;

[8] Clinical Trial Service Unit and Epidemiological Studies Unit, Nuffield Department of Population Health, University of Oxford, Oxford, UK;

[9] Munich Cluster for Systems Neurology (SyNergy), Munich, Germany;

[10] German Centre for Neurodegenerative Diseases (DZNE), Munich, Germany

Address for correspondence:

Martin Dichgans, MD

Institute for Stroke and Dementia Research

University Hospital of Ludwig-Maximilians-University (LMU)

Feodor-Lynen-Str. 17, 81377 Munich, Germany

Phone: +49-89-4400-46018; Fax: +49-89-4400-46040

e-mail: martin.dichgans@med.uni-muenchen.de

Abstract

Blood lipids are causally involved in the pathogenesis of atherosclerosis, but their role in cerebral small vessel disease (SVD) remains largely elusive. Here, we explored associations of genetically determined levels of blood lipids and lipoprotein particle components, and of genetic proxies for lipid-modifying drugs with SVD phenotypes. We selected genetic instruments for blood levels of high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and triglycerides (TG), for cholesterol and TG components of size-defined lipoprotein particles, and for lipid-modifying drug targets based on published genome-wide association studies (up to 617,303 individuals). Applying two-sample Mendelian Randomization (MR) approaches (inverse-variance weighted MR, weighted median estimator, MR-Egger, multivariable MR) we investigated associations with ischemic and hemorrhagic manifestations of SVD (small vessel stroke [SVS], 11,710 cases, 287,067 controls; white matter hyperintensities [WMH], 10,597 individuals; intracerebral hemorrhage [ICH], 1,545 cases, 1,481 controls). Genetically elevated HDL-C levels were associated with lower risk of SVS (OR per SD=0.85, 95%CI=0.78-0.92) and lower WMH volume (β=-0.07, 95%CI=-0.12 to -0.02), which in multivariable MR remained stable after adjustments for LDL-C and TG. In analyses of lipoprotein particle components by size, we found these effects to be specific for cholesterol concentration in medium-sized HDL, and not large- or extra-large-HDL particles. Association estimates for ICH were negatively correlated with those for SVS and WMH volume across all lipid traits and lipoprotein particle components. HDL-C-raising genetic proxies for cholesteryl-ester transfer protein (CETP) inhibitors (*CETP* locus) were associated with lower risk of SVS (OR: 0.82, 95%CI=0.75-0.89) and lower WMH volume (β=-0.08, 95%CI=-0.13 to -0.02), but a higher risk of ICH (OR: 1.64, 95%CI=1.26-2.13). Genetic predisposition to higher HDL-C, specifically to cholesterol in medium-sized HDL particles, is associated with both a lower risk of SVS and lower WMH volume. These analyses indicate that HDL-C-raising strategies could be considered for the prevention of ischemic SVD but the net benefit of such an approach would need to be tested in a randomized controlled trial.

Keywords: lipids, small vessel disease, Mendelian Randomization, high-density lipoprotein, lacunar stroke.

Abbreviations: SVD=small vessel disease, HDL-C=high-density lipoprotein cholesterol, LDL-C=low-density lipoprotein cholesterol, TG=triglycerides, MR=Mendelian Randomization, SVS=small vessel stroke, WMH=white matter hyperintensities, ICH=intracerebral hemorrhage, OR=odds ratio, CETP= cholesteryl-ester transfer protein, GWAS=genome-wide association study, PCSK9= Proprotein convertase subtilisin/kexin type 9.

Introduction

Cerebral small vessel disease (SVD) accounts for about 20% of all ischemic strokes (Sudlow and Warlow, 1997) and most cases of intracerebral hemorrhage (ICH) (Qureshi *et al.*, 2001; Qureshi *et al.*, 2009). SVD is the leading cause of vascular dementia (Dichgans and Leys, 2017; Iadecola *et al.*, 2019) and an independent predictor of mortality (Debette *et al.*, 2018; Georgakis *et al.*, 2019). Manifestations of SVD on MRI are highly prevalent in the ageing population with figures reaching 90% for white matter hyperintensities (WMH) in patients aged 65 years and above (de Leeuw *et al.*, 2001; Pantoni, 2010; Wardlaw *et al.*, 2013; Wardlaw *et al.*, 2019). However, the mechanisms underlying SVD are poorly understood, thus impeding the development of effective strategies for prevention.

Blood lipids are a well-established risk factor for large artery atherosclerosis (Collins *et al.*, 2016) and lipid-modifying therapies have shown benefits in reducing risk of both coronary artery disease and stroke (Cholesterol Treatment Trialists *et al.*, 2010; Chou *et al.*, 2016). Yet, their role in SVD remains largely elusive. Current guidelines for secondary stroke prevention recommend treatment with statins after ischemic stroke or transient ischemic attack (European Stroke Organisation Executive and Committee, 2008; Kernan *et al.*, 2014; Intercollegiate Stroke Working Party, 2016; Stroke Foundation, 2017) referring to clinical trials data and meta-analyses (Amarenco *et al.*, 2006; Amarenco and Labreuche, 2009; Manktelow and Potter, 2009). However, most trials provided no sub-analyses for ischemic stroke subtypes. The J-STARS trial, the only study providing sub-analyses, found statins to reduce recurrence of large artery stroke but not small vessel stroke (SVS) (Hosomi *et al.*, 2015). Results from the SPARCL trial suggest that statins may increase the risk of ICH in patients with stroke or transient ischemic attack (Amarenco *et al.*, 2006), especially in patients with SVS as an entry event (Goldstein *et al.*, 2008).

Mendelian randomization (MR) makes use of genetic variants that are associated with an exposure or risk factor as instruments, and investigates their associations with disease outcomes thus overcoming some of the key limitations of observational studies such as confounding and reverse causation (Hopewell and Clarke, 2016; Holmes *et al.*, 2017). Hence, MR analyses can assess the causal relevance of a risk factor for disease and facilitate prioritization of interventions to be tested in clinical trials (Holmes *et al.*, 2017; O'Donnell and Sabatine, 2018) as has specifically been demonstrated for lipid-modifying drugs (Khera

and Kathiresan, 2017; Dichgans *et al.*, 2019). In fact, there are several examples where MR studies have predicted the success or failure of clinical trials (Ference *et al.*, 2015; Ference *et al.*, 2016; Ference *et al.*, 2017b; Gill *et al.*, 2018; Ference *et al.*, 2019b; Ray *et al.*, 2019). The availability of large-scale genome-wide association studies (GWAS) for an expanding range of phenotypes and the development of two-sample MR approaches enable the exploration of associations for which there is a paucity of evidence from clinical trials, as is the case for lipids and cerebral SVD.

Here, we leveraged data from the largest GWAS currently available on blood lipid levels (617,303 individuals) (Willer *et al.*, 2013; Klarin *et al.*, 2018) and on both ischemic (SVS, WMH volume) and hemorrhagic (ICH) manifestations of cerebral SVD (Woo *et al.*, 2014; Malik *et al.*, 2018a; Rutten-Jacobs *et al.*, 2018) with the aim to: (i) examine the effects of genetically determined blood levels of high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and triglycerides (TG) on SVD manifestations; (ii) explore associations between size-defined lipoprotein particle fractions with these phenotypes, and (iii) determine the effects of genetic proxies for HDL-C-raising (CETP inhibitors), LDL-C-lowering (statins, ezetimibe, PCSK9 inhibitors, bile acid resins), and TG-lowering (fibrates) drug classes on SVD manifestations.

Materials and Methods

Study design and data sources

The data sources used for this study are detailed in **Supplementary Table 1**. In MR analyses, we examined associations of blood lipid levels, size-defined lipoprotein particle fractions, and lipid-modifying drug targets, with ischemic and hemorrhagic SVD phenotypes. We selected genetic instruments from the GWAS summary statistics of the Million Veteran Program (MVP) (Klarin *et al.*, 2018), the Global Lipids Genetics Consortium (GLGC) (Willer *et al.*, 2013), and from a GWAS on Nuclear Magnetic Resonance (NMR)-measured circulating metabolites (Kettunen *et al.*, 2016). We then examined associations of the selected instruments with SVS in the GWAS summary statistics of the MEGASTROKE Consortium (Malik *et al.*, 2018a), with WMH volume in a GWAS analysis that we

undertook in the UK Biobank neuroimaging dataset (Alfaro-Almagro *et al.*, 2018), and with ICH in the International Stroke Genetics Consortium (ISGC) GWAS meta-analysis (Woo *et al.*, 2014).

Genetic instrument selection

Blood lipid levels. We selected genetic instruments for the blood levels of HDL-C, LDL-C, and TG, based on the results of the GWAS multi-ethnic meta-analysis of the MVP and the GLGC samples (617,303 individuals) (Klarin *et al.*, 2018). Specifically, we used independent genetic variants that reached genome-wide level of significance ($p<5x10^{-8}$) for their associations with HDL-C, LDL-C, and TG, in the conditional GWAS meta-analyses as instruments. We identified 312 instruments for HDL-C, 219 for LDL-C, and 253 for TG (**Supplementary Table 2**). In our primary analyses, we weighted the instruments based on the joint regression coefficients from the conditional GWAS meta-analysis of MVP and GLGC. As the GLGC further excluded participants on lipid-lowering treatment (Willer *et al.*, 2013), to exclude sources of biases related to treatment-mediated effects on blood lipids in the MVP dataset, we performed sensitivity analyses weighting the instruments using the GLGC effect sizes only. Both MVP and GLGC were imputed to the 1000 Genomes Project (phase 3 and phase 1, respectively) (Genomes Project *et al.*, 2012) and included adjustments for age, age^2, sex, and population structure.

In a secondary approach, we restricted our selection of instruments to HDL-C-, LDL-C-, and TG-specific variants. Particularly, we used the GLGC dataset (188,577 individuals), for which we had access to the full GWAS summary statistics (Willer *et al.*, 2013), and identified those independent genetic variants associated with HDL-C, LDL-C, or TG at genome-wide significance ($p<5x10^{-8}$), but showed associations of $p>0.01$ with the other two traits. We found 19 HLD-C-specific, 25 LDL-C-specific, and 4 TG-specific variants (**Supplementary Table 3**) and performed sensitivity analyses utilizing them as instruments.

Size-defined lipoprotein particle fractions. We then selected genetic instruments for cholesterol and TG concentrations in size-defined lipoprotein particles available from a GWAS for NMR-measured circulating metabolites on 24,925 European individuals (Kettunen *et al.*, 2016). The GWAS analyses were imputed to the 1000 Genomes Project (phase 1) and adjusted for age, sex, time from last meal, and population structure (Kettunen *et al.*, 2016). Based on summary statistics for each trait, we extracted

variants after clumping for linkage disequilibrium (LD) at $r^2<0.1$ that reached genome-wide significance ($p<5x10^{-8}$). The identified instruments for each metabolite are available in **Supplementary Table 4**.

Proxies for lipid-modifying drug targets. To assess the effect of available lipid-modifying drug classes on SVD phenotypes, we selected variants clumped for LD at $r^2<0.1$ within a region of 100 kB upstream or downstream from genes encoding known drug targets that were associated with the respective lipid trait at a genome-wide significant level ($p<5x10^{-8}$) in the GLGC dataset (Willer *et al.*, 2013). Specifically, we searched for genetic proxies for CETP inhibitors (*CETP* locus) based on associations of the variants with HDL-C levels; for statins (*HMGCR)*, ezetimibe (*NPC1L1)*, PCSK9 inhibitors (*PCSK9)*, bile acid resins (*ABCG5* and *ABCG8*), and for the therapeutic target of the LDL receptor (*LDLR*) based on associations of the variants with LDL-C levels; and for fibrates (*PPARA*) based on associations of the variants with TG levels, in accordance with similar approaches applied by other studies (Ference *et al.*, 2012; Ference *et al.*, 2015; Anderson *et al.*, 2016; Ference *et al.*, 2017b; Harrison *et al.*, 2018; Nowak and Arnlov, 2018; Ference *et al.*, 2019a). We identified 24 HDL-C-raising variants in *CETP*, and for LDL-C lowering targets, 4 variants in *HMGCR*, 3 in *NPC1L1*, 11 in *PCSK9*, 6 in *ABCG5/G8,* and 8 in *LDLR* (**Supplementary Table 5**). No TG-lowering proxies for fibrates in the *PPARA* locus were identified based on our selection criteria for instruments.

For each genetic instrument, we estimated the proportion of variance explained for the respective phenotype and measured instrument strength with F-statistics (**Supplementary Tables 2-5**). F was >10 for all selected instruments, indicating a low probability for weak instrument bias (Palmer *et al.*, 2012). Furthermore, we performed power calculations (Burgess, 2014) to identify the range of association estimates that we had >80% power (1-β) to detect at α=0.05 (**Supplementary Table 6**).

Associations with outcomes

The outcomes examined in this study were ischemic and hemorrhagic manifestations of SVD including SVS, WMH volume and ICH. Genetic association estimates for SVS; defined according to the TOAST (Trial of Org 10172 in Acute Stroke Treatment) criteria (Adams *et al.*, 1993) were obtained from the MEGASTROKE multi-ethnic GWAS meta-analysis (Malik *et al.*, 2018a; Malik *et al.*, 2018b) on 11,710

cases and 287,067 controls. For WMH volume, we performed a GWAS analysis in the UK Biobank Imaging dataset (10,597 individuals of White-British ancestry), based on the measurements of WMH volume in T1 and T2 FLAIR MRI sequences, as previously described, following adjustments for age, sex, and the first 10 principal components (Rutten-Jacobs *et al.*, 2018). We further examined ICH, as well as ICH subtypes defined according to hemorrhage location (deep and lobar). We used summary statistics from the ISGC GWAS meta-analysis including 1,545 cases of spontaneous ICH defined by acute neurological onset and compatible neuroimaging showing intraparenchymal hemorrhage (664 lobar, 881 deep) and 1,481 controls of European ancestry (Woo *et al.*, 2014).

Statistical analysis

Following extraction of the association estimates between the instruments and the outcomes and harmonization of the direction of estimates by effect alleles, we computed MR estimates for each instrument with the Wald estimator and standard errors with the Delta method. We then pooled individual MR estimates using random-effects inverse-variance weighted (IVW) meta-analyses, which provides robust causal estimates under absence of directional pleiotropy (Burgess *et al.*, 2013).

The IVW method was our primary MR analysis approach, but the derived estimates might be biased in case of directional pleiotropy. As a measure of pleiotropy, we assessed heterogeneity across the MR estimates for each instrument in the IVW MR analyses with the Cochran's Q statistic (Bowden *et al.*, 2018). Under presence of nominal heterogeneity (p from Cochran' Q <0.10) we further applied alternative MR methods which are more robust to the use of pleiotropic instruments. These were the weighted median estimator and the MR-Egger regression. The weighted median estimator allows the use of invalid instruments under the assumption that at least half of the instruments used in the MR analysis are valid (Hartwig *et al.*, 2017). The MR-Egger regression allows for the estimation of an intercept term, which can be used as an indicator of unbalanced directional pleiotropy (Bowden *et al.*, 2015). MR-Egger provides less precise estimates and relies on the assumption that the strengths of potential pleiotropic instruments are independent of their direct associations with the outcome (Bowden *et al.*, 2015). The intercept obtained from MR-Egger regression was used as a measure of directional pleiotropy (p<0.05

indicated statistical significance) (Bowden *et al.*, 2015). In case of evidence of pleiotropy (as assessed by both the Cochran's Q statistic and the intercept in the MR-Egger regression) and inconsistent results between the different approaches, we further applied the generalized summary data-based MR (GSMR) approach. This method uses all variants reaching genome-wide significance as instruments by accounting for LD correlation between them and further identifies and eliminates outliers that exert apparent pleiotropic effects on both the risk factor and the outcome using the HEIDI-outlier method (Zhu *et al.*, 2018). GSMR further provides a measure of remaining global heterogeneity following exclusion of outliers that also takes into account the low LD across the used instruments.

Given the correlation between HDL-C, LDL-C, and TG levels, and between cholesterol and triglyceride concentrations in specific size-defined lipoprotein particles, we performed multivariable MR to disentangle their independent associations with SVD phenotypes (Burgess and Thompson, 2015). For HDL-C, LDL-C, and TG blood levels, we used the respective instruments and adjusted for their effects on the other two traits from the GLGC dataset. For cholesterol concentration in HDL particles, we combined all unique variants associated with either total HDL-C levels or size-defined HDL cholesterol concentration and adjusted for their effects on blood LDL-C and TG levels. Similarly, for cholesterol concentration in LDL and larger particles, we combined all variants associated with either total LDL-C levels or size-defined LDL and larger particle cholesterol concentrations and adjusted for their effects on HDL-C levels. Finally, we combined instruments for either total circulating TG levels or for particle-specific TG concentrations and adjusted for their effects on HDL-C and LDL-C.

For all analyses, we corrected for multiple comparisons with the false discovery rate (FDR) approach and set statistical significance at a q-value <0.05. Associations not reaching this threshold, but showing a $p<0.05$ were considered suggestive of an association. All analyses were performed in R (v3.5.0; The R Foundation for Statistical Computing).

Data availability

The data used for the current study are publicly available and may also become available from the corresponding author on reasonable request.

Results

Genetically determined blood lipid levels and ischemic SVD

The primary results of the IVW MR analyses for the associations between genetically determined blood lipid levels and SVS and WMH volume are presented in **Figure 1**. Genetically elevated HDL-C levels were associated with both a lower risk of SVS (OR: 0.85, 95%CI: 0.78-0.92, $p=5x10^{-4}$) and lower WMH volume (β: -0.07, 95%CI: -0.12 to -0.02, p=0.004). We further found genetic predisposition to higher TG levels to be associated with higher risk of SVS and a suggestive association between genetic predisposition to higher LDL-C levels and SVS risk. In multivariable MR, the associations between genetically determined HDL-C levels and SVS and WMH volume remained stable and statistically significant (**Figure 1**). In contrast, the association between genetically determined TG levels and SVS was attenuated when adjusting for HDL-C and LDL-C.

The MR results were stable when weighting the genetic instruments for the three lipid traits based on their association estimates in the GLGC dataset, which excluded individuals on lipid-modifying treatment (**Supplementary Figures 1-2**). In MR analyses restricted to the instruments specifically associated with HDL-C, LDL-C, or TG, the association estimates of genetically determined HDL-C for both risk of SVS (OR: 0.78, 95%CI: 0.62-0.98) and WMH volume (β: -0.27, 95%CI: -0.45 to -0.08) were even stronger (**Supplementary Figure 3**). GSMR-HEIDI, which identifies and excludes pleiotropic outlier variants, also showed significant associations between genetically elevated HDL-C and both lower SVS risk and lower WMH volume (**Supplementary Figures 1-2).**

Genetically determined size-defined lipoprotein particle fractions and ischemic SVD

To obtain a deeper understanding of the observed associations, we next selected genetic instruments for cholesterol and TG concentrations in size-defined lipoprotein particles and examined their associations with SVS and WMH volume (**Figure 2** and **Supplementary Tables 7**). We found genetically elevated cholesterol concentration in the medium-sized, but not in the large- or extra-large-sized HDL particles, to be associated with both lower SVS risk (OR: 0.84, 95%CI: 0.73-0.96, p=0.007) and lower WMH volume

(β: -0.09, 95%CI: -0.16 to -0.02, p=0.009). There was no heterogeneity and the associations remained significant when adjusting for the effects of the instruments on circulating LDL-C and TG levels (**Figure 2** and **Supplementary Table 8**).

Because of evidence for heterogeneity (Cochran's Q p<0.10) and inconsistent results for the associations of genetically determined total HDL-C with SVS risk and WMH volume across sensitivity analyses (weighted median and MR-Egger) (**Figure 3**, **Supplementary Figures 1-2**), we next restricted the set of instruments for total HDL-C to those associated with medium-sized HDL-C ($p<5x10^{-8}$). These analyses revealed stronger association estimates between genetically elevated HDL-C and both lower risk of SVS (OR: 0.69, 95%CI: 0.56-0.84, $p=4x10^{-4}$) and lower WMH volume (β: -0.23, 95%CI: -0.35 to -0.10, $p=2x10^{-4}$) (**Figure 3**). Moreover, the estimates were highly consistent in alternative MR approaches with no evidence for heterogeneity, thus suggesting that heterogeneity in the overall analyses was driven by non-medium-sized HDL-C-increasing variants.

Regarding other lipoprotein particle components, there was suggestive evidence for associations between genetically elevated cholesterol concentration in LDL and larger particles with a higher SVS risk (**Figure 2** and **Supplementary Tables 7-9**). We further found a genetically elevated concentration of TG in the small-sized HDL particles to be associated with higher risk of SVS (**Figure 2**).

Genetic proxies for lipid-modifying drug targets and ischemic SVD

To explore the effects of lipid-modifying drug classes on SVD, we next selected genetic variants in genes encoding known HDL-C-raising or LDL-C-lowering drug targets and examined their associations with ischemic SVD phenotypes. HDL-C-raising proxies for CETP inhibition were associated with lower risk of SVS (OR: 0.82, 95%CI=0.75-0.89, $p=9x10^{-6}$) and lower WMH volume (β=-0.08, 95%CI=-0.13 to -0.02, p=0.008) (**Figure 4** and **Figure 5A-B**). While there was heterogeneity in the association between *CETP* variants and SVS (p=0.03), the results remained significant in the weighted median and MR-Egger approaches (**Supplementary Table 10**). Analyses for LDL-C-lowering drug classes showed suggestive (p<0.05) associations between genetic proxies for statins (*HMGCR* locus), ezetimibe (*NPC1L1*), and LDL-C lowering through the LDL receptor (*LDLR*) with a lower SVS risk (**Figure 4**).

Genetic associations of lipid traits with intracerebral hemorrhage

IVW-MR analyses showed no significant associations of genetically determined HDL-C, LDL-C, and TG with risk of ICH (**Supplementary Figure 4**). When examining lipoprotein particle fractions, we found associations of the opposite direction, as compared to both SVS and WMH volume (**Figure 6**). However, confidence intervals were wide, likely due to lack of statistical power (**Supplementary Figure 5**, **Supplementary Tables 6** and **11**). Among genetic proxies for lipid-modifying drug targets (**Supplementary Figure 6**) we found HDL-C-raising proxies for CETP inhibitors to be associated with a higher risk of ICH (OR: 1.64, 95%CI: 1.26-2.13, $p=2.6x10^{-4}$) (**Figure 5C**). This effect was significant for both deep (OR: 2.01, 95%CI: 1.27-3.18, p=0.003) and lobar ICH (OR: 1.78, 95%CI: 1.06-2.89, p=0.028) (**Supplementary Figure 7**).

Discussion

The main findings from this study can be summarized as follows: First, we found significant associations between genetic predisposition to higher HDL-C levels and both lower risk of SVS and lower WMH volume. Second, associations were specific for cholesterol concentrations in the medium- and not large- or extra-large sized HDL particles. Third, using genetic proxies for lipid-modifying drug classes, we found HDL-C raising through CETP inhibition to be associated with a lower SVS risk and lower WMH volume. Fourth, there was some indication for an association between genetically elevated LDL-C and higher risk of SVS. Finally, for ICH, we found associations of the opposite direction for all lipid traits and lipoprotein particle fractions compared to SVS and WMH, and genetic proxies for CETP inhibition were associated with a higher risk of both lobar and deep ICH.

Our MR results provide evidence for a protective role of HDL-C on ischemic SVD. This agrees with findings from two small observational studies: In the Women's Healthy Ageing Project, midlife HDL-C levels among 135 women were inversely associated with WMH volume after 20 years, independently of other vascular risk factors (Aljondi *et al.*, 2018). Similarly, in a cross-sectional study of 817 participants

aged ≥50 years, higher HDL-C levels were cross-sectionally associated with lower volumes of both deep and periventricular WMH after adjusting for vascular risk factors (Yin *et al.*, 2018). These findings contrast with MR analyses on atherosclerotic phenotypes supporting no association of genetically determined HDL-C levels with coronary artery disease (Voight *et al.*, 2012; Holmes *et al.*, 2015; White *et al.*, 2016) and large artery stroke (Hindy *et al.*, 2018) thus suggesting differential effects of HDL-C on cerebral SVD and large artery atherosclerosis. The mechanisms underlying the observed inverse association between HDL-C levels and ischemic SVD are unknown but may involve protective effects on the vascular endothelium (Sorrentino *et al.*, 2010; Prosser *et al.*, 2012; Tran-Dinh *et al.*, 2013; Monette *et al.*, 2016). Endothelial cells, including those of the brain microvasculature (Lapergue *et al.*, 2010; Fung *et al.*, 2017), express receptors which upon HDL binding induce intracellular signaling eventually leading to vasodilatory (Yuhanna *et al.*, 2001; Spieker *et al.*, 2002; Nofer *et al.*, 2004), anti-inflammatory (Cockerill *et al.*, 1995; Nicholls *et al.*, 2005; Murphy *et al.*, 2008), anti-oxidative (Garner *et al.*, 1998; Lee *et al.*, 2005; Terasaka *et al.*, 2007), and anti-thrombotic effects (Viswambharan *et al.*, 2004; Calkin *et al.*, 2009).

Analyzing size-defined lipoprotein particle subfractions we found that the protective effects of HDL-C on ischemic SVD are specific for medium-sized, and not larger HDL particles. HDL comprises a heterogeneous pool of lipoprotein particles (Kontush and Chapman, 2010) and the few observational studies that have performed analyses stratified by particle size indeed found differential effects on vascular outcomes (Martin *et al.*, 2015; Wurtz *et al.*, 2015; Joshi *et al.*, 2016; Holmes *et al.*, 2018). There are technical challenges related to different methods of HDL subfractioning (Superko *et al.*, 2012). Still, our results agree with the general notion that the favorable effects observed for HDL are predominantly exerted by the smaller and denser HDL particles (Yu *et al.*, 2003; Williams, 2012; Martin *et al.*, 2014). Of note, previous MR studies on blood lipids that showed no significant associations between HDL-C levels and atherosclerotic phenotypes did not consider particle subfractions (Holmes *et al.*, 2015; White *et al.*, 2016; Hindy *et al.*, 2018). Conceivably, disregarding subfractions might result in masking causal effects of potential biological relevance. As such, our findings highlight the importance of sub-analyses stratifying by lipoprotein particle size.

Importantly, we found genetic proxies for CETP inhibitors, which increase the circulating pool of HDL particles (Armitage *et al.*, 2019), to also associate with lower SVS risk and WMH volume. While initial randomized trials investigating CETP inhibitors on top of statins found no benefit of CETP inhibition on vascular risk (Barter *et al.*, 2007; Schwartz *et al.*, 2012; Lincoff *et al.*, 2017), the most recent REVEAL trial showed a reduced risk for major coronary events (HPS3/TIMI55–REVEAL Collaborative Group *et al.*, 2017). In light of the relatively small effect (relative risk reduction in REVEAL: 9%) it seems unlikely that CETP inhibitors will achieve approval for prevention of cardiovascular disease (Hegele, 2017; Badimon, 2018). However, none of these trials explicitly reported effects on risk of SVS or other SVD manifestations. Our MR results suggest that *post hoc* analyses should consider stratifying for stroke subtypes, and that HDL-C-raising approaches might show promise as a strategy for lowering the burden of ischemic SVD.

The exact mechanism by which CETP inhibition might reduce risk of SVS and WMH volume is poorly understood. In the REVEAL trial, the reduction in vascular risk by CETP inhibition was mediated by a reduction in LDL-C rather than an increase in HDL-C (HPS3/TIMI55–REVEAL Collaborative Group *et al.*, 2017). In our analyses, most of the HDL-C raising *CETP* variants also showed strong associations with LDL-C and TG levels. While we were not sufficiently powered to disentangle the effects of the three traits, we assume *CETP* variants to reduce ischemic SVD burden by reducing HDL-C, in accordance with our findings from the multivariable MR analyses for HDL-C, LDL-C, and TG. Administration of CETP inhibitors increases HDL particle size (Brousseau *et al.*, 2004) and genetically elevated CETP concentration is associated with increased concentrations of medium- and large-sized, but not smaller HDL particles (Blauw *et al.*, 2019). However, whether the expected effects of CETP inhibition on SVS and WMH volume are mediated through increases in the pool of specific HDL subparticles would need to be explored in future studies.

We found an opposite direction of the associations between lipid traits and ICH risk as compared to SVS and WMH volume. This is in agreement with previous observational and genetic studies that found high HDL-C and low LDL-C levels to be associated with a higher risk of ICH (Wang *et al.*, 2013; Anderson *et al.*, 2016; Sun *et al.*, 2019), as well as clinical trials showing that LDL-C lowering with statins might increase risk for ICH (Amarenco *et al.*, 2006; Goldstein *et al.*, 2008). Genetic proxies for CETP inhibitors

were associated with a higher risk of both deep and lobar ICH, which relate to different vascular pathologies. Specifically, deep ICH has been associated with hypertensive SVD, whereas lobar ICH is typically related to cerebral amyloid angiopathy (Martini *et al.*, 2012). While speculative, low serum LDL-C and high HDL-C levels may be associated with a fragile vascular endothelium, eventually leading to vessel permeability and a higher susceptibility to rupture (Konishi *et al.*, 1993).

Our results provide some evidence for an association between high LDL-C levels and SVS risk. While most associations did not reach statistical significance after FDR correction, they were suggestive across different levels of analyses including total LDL-C levels, cholesterol concentration in LDL and larger particles, and LDL-C-lowering drug targets. High LDL-C levels are a well-established risk factor for atherosclerosis and LDL particle accumulation in the subendothelial space causally contributes to atherogenesis and atheroprogression (Goldstein and Brown, 2015; Ference *et al.*, 2017a). Yet, the role of LDL in the initiation and the progression of SVD pathology remains unknown (Lammie, 2000; Pantoni, 2010). In view of the observed suggestive associations between genetic proxies for LDL-C-lowering drug classes with risk of SVS, additional data from clinical trials would be needed to explore whether LDL-C-lowering treatment is actually effective for the primary and secondary prevention of all ischemic stroke subtypes including SVS. The inconsistency in the associations between genetic proxies for statins, ezetimibe, and PCSK9 inhibition, all acting by modulating the LDL receptor pathway (Ference *et al.*, 2017a), and risk of SVS observed here is difficult to explain given the lack of sufficient power.

Our study has several strengths. The use of large genetic datasets enabled us to explore associations with a range of phenotypes, covering key manifestations of cerebral SVD. Also, the use of GWAS data for NMR-derived measurements enabled analyses stratified for lipoprotein particle subfractions. We further performed multiple tests for the detection of unbalanced pleiotropy and used multiple sensitivity analyses including advanced approaches such as GSMR-HEIDI. These analyses showed consistent results thus minimizing the possibility of bias in the MR analyses. Finally, we used genetic proxies for lipid-modifying drug classes that have previously been validated and showed comparable effects to those derived from RCTs.

Our study also has limitations. First, MR examines the lifetime effect of genetically determined blood lipid levels, which might differ from the effects of clinical lipid-modifying interventions. Second, we were

not sufficiently powered to identify significant associations for ICH, and especially for ICH subtypes. Similarly, the non-significant, but still suggestive associations between LDL-C levels and SVS risk should be tested in larger datasets offering greater statistical power. Third, we had no access to the full summary statistics from the meta-analysis of the MVP and the GLGC studies. Hence, some analyses were restricted to the smaller GLGC dataset. Fourth, there were no data available on cerebral microbleeds that would more accurately capture the spectrum of hemorrhagic SVD pathology than the currently used phenotype of ICH. Finally, we could not identify valid genetic proxies for fibrates, a TG-lowering drug class, to also explore their associations with SVD phenotypes. Future studies leveraging even larger GWAS datasets on blood lipid levels might identify genetic instruments for the full range of lipid-modifying drug classes.

In conclusion, our results suggest causal associations between higher HDL-C levels and both a lower risk of SVS and lower WMH volume, which were driven by cholesterol concentrations in medium-sized, and not larger HDL particles. HDL-C-raising strategies might be of benefit for the prevention of ischemic SVD. Considering the predicted increase in risk of ICH, the net benefit of such an approach would need to be tested in a randomized controlled trial.

Acknowledgements

This research has been conducted using the UK Biobank Resource (UK Biobank application 2532). We acknowledge the contributions by the MEGASTROKE Consortium, the ISGC, the GLGC, the MVP, as well as by Kettunen *et al*., for performing the original GWASs and for making summary statistics data publicly available.

Funding

Dr. Georgakis has been supported by scholarships from the Onassis Foundation and the German Academic Exchange Service (DAAD). Dr. Anderson received grants from the National Institutes of Health and the National Institute of Neurological Disorders and Stroke (Grant numbers: R01NS103924,

K23NS086873). This project has received funding from the European Union's Horizon 2020 research and innovation programme (No 666881), SVDs@target (to Dr. Dichgans) and No 667375, CoSTREAM (to M. Dichgans); the DFG as part of the Munich Cluster for Systems Neurology (EXC 1010 SyNergy) and the CRC 1123 (B3) (to Dr. Dichgans); the Corona Foundation (to Dr. Dichgans); the Fondation Leducq (Transatlantic Network of Excellence on the Pathogenesis of Small Vessel Disease of the Brain)(to Dr. Dichgans); the e:Med program (e:AtheroSysMed) (to Dr. Dichgans) and the FP7/2007-2103 European Union project CVgenes@target (grant agreement number Health-F2-2013-601456) (to Dr. Dichgans).

Competing interests

Dr. Anderson receives sponsored research support from the National Institutes of Health of the United States, the American Heart Association, Massachusetts General Hospital, and Bayer AG, and has consulted for ApoPharma, Inc. Dr. Hopewell receives personal fellowship support from the British Heart Foundation [FS/14/55/30806]. Dr Hopewell, works in the Clinical Trial Service Unit & Epidemiological Studies Unit of the Nuffield Department of Population Health at the University of Oxford, which has received research grants from Abbott, AstraZeneca, Bayer, Boehringer Ingelheim, GlaxoSmithKline, The Medicines Company, Merck, Mylan, Novartis, Pfizer, Roche, Schering, and Solvay, which are governed by University of Oxford contracts that protect their independence. In line with the Clinical Trial Service Unit & Epidemiological Studies Unit staff policy, Dr Hopewell does not take any personal payments directly or indirectly from industry (with reimbursement sought only for the costs of travel and accommodation to attend scientific meetings) for clinical trial involvement. Drs. Georgakis, Malik, Parhofer, and Dichgans have no competing interests to declare.

References

Adams HP, Jr., Bendixen BH, Kappelle LJ, Biller J, Love BB, Gordon DL*, et al.* Classification of subtype of acute ischemic stroke. Definitions for use in a multicenter clinical trial. TOAST. Trial of Org 10172 in Acute Stroke Treatment. Stroke 1993; 24(1): 35-41.

Alfaro-Almagro F, Jenkinson M, Bangerter NK, Andersson JLR, Griffanti L, Douaud G, *et al.* Image processing and Quality Control for the first 10,000 brain imaging datasets from UK Biobank. Neuroimage 2018; 166: 400-24.

Aljondi R, Szoeke C, Steward C, Gorelik A, Desmond P. The effect of midlife cardiovascular risk factors on white matter hyperintensity volume and cognition two decades later in normal ageing women. Brain Imaging Behav 2018.

Amarenco P, Bogousslavsky J, Callahan A, 3rd, Goldstein LB, Hennerici M, Rudolph AE, *et al.* High-dose atorvastatin after stroke or transient ischemic attack. N Engl J Med 2006; 355(6): 549-59.

Amarenco P, Labreuche J. Lipid management in the prevention of stroke: review and updated meta-analysis of statins for stroke prevention. Lancet Neurol 2009; 8(5): 453-63.

Anderson CD, Falcone GJ, Phuah CL, Radmanesh F, Brouwers HB, Battey TW, *et al.* Genetic variants in CETP increase risk of intracerebral hemorrhage. Ann Neurol 2016; 80(5): 730-40.

Armitage J, Holmes MV, Preiss D. Cholesteryl Ester Transfer Protein Inhibition for Preventing Cardiovascular Events: JACC Review Topic of the Week. J Am Coll Cardiol 2019; 73(4): 477-87.

Badimon L. CETP inhibition and HDL: what is the trial REVEALing? Cardiovasc Res 2018; 114(2): e15-e6.

Barter PJ, Caulfield M, Eriksson M, Grundy SM, Kastelein JJ, Komajda M, *et al.* Effects of torcetrapib in patients at high risk for coronary events. N Engl J Med 2007; 357(21): 2109-22.

Blauw LL, Noordam R, Soidinsalo S, Blauw CA, Li-Gao R, de Mutsert R, *et al.* Mendelian randomization reveals unexpected effects of CETP on the lipoprotein profile. Eur J Hum Genet 2019; 27(3): 422-31.

Bowden J, Davey Smith G, Burgess S. Mendelian randomization with invalid instruments: effect estimation and bias detection through Egger regression. Int J Epidemiol 2015; 44(2): 512-25.

Bowden J, Hemani G, Davey Smith G. Invited Commentary: Detecting Individual and Global Horizontal Pleiotropy in Mendelian Randomization-A Job for the Humble Heterogeneity Statistic? Am J Epidemiol 2018; 187(12): 2681-5.

Brousseau ME, Schaefer EJ, Wolfe ML, Bloedon LT, Digenio AG, Clark RW, *et al.* Effects of an inhibitor of cholesteryl ester transfer protein on HDL cholesterol. N Engl J Med 2004; 350(15): 1505-15.

Burgess S. Sample size and power calculations in Mendelian randomization with a single instrumental variable and a binary outcome. Int J Epidemiol 2014; 43(3): 922-9.

Burgess S, Butterworth A, Thompson SG. Mendelian randomization analysis with multiple genetic variants using summarized data. Genet Epidemiol 2013; 37(7): 658-65.

Burgess S, Thompson SG. Multivariable Mendelian randomization: the use of pleiotropic genetic variants to estimate causal effects. Am J Epidemiol 2015; 181(4): 251-60.

Calkin AC, Drew BG, Ono A, Duffy SJ, Gordon MV, Schoenwaelder SM, *et al.* Reconstituted high-density lipoprotein attenuates platelet function in individuals with type 2 diabetes mellitus by promoting cholesterol efflux. Circulation 2009; 120(21): 2095-104.

Cholesterol Treatment Trialists C, Baigent C, Blackwell L, Emberson J, Holland LE, Reith C, *et al.* Efficacy and safety of more intensive lowering of LDL cholesterol: a meta-analysis of data from 170,000 participants in 26 randomised trials. Lancet 2010; 376(9753): 1670-81.

Chou R, Dana T, Blazina I, Daeges M, Jeanne TL. Statins for Prevention of Cardiovascular Disease in Adults: Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA 2016; 316(19): 2008-24.

Cockerill GW, Rye KA, Gamble JR, Vadas MA, Barter PJ. High-density lipoproteins inhibit cytokine-induced expression of endothelial cell adhesion molecules. Arterioscler Thromb Vasc Biol 1995; 15(11): 1987-94.

Collins R, Reith C, Emberson J, Armitage J, Baigent C, Blackwell L*, et al.* Interpretation of the evidence for the efficacy and safety of statin therapy. Lancet 2016; 388(10059): 2532-61.

de Leeuw FE, de Groot JC, Achten E, Oudkerk M, Ramos LM, Heijboer R*, et al.* Prevalence of cerebral white matter lesions in elderly people: a population based magnetic resonance imaging study. The Rotterdam Scan Study. J Neurol Neurosurg Psychiatry 2001; 70(1): 9-14.

Debette S, Schilling S, Duperron MG, Larsson SC, Markus HS. Clinical Significance of Magnetic Resonance Imaging Markers of Vascular Brain Injury: A Systematic Review and Meta-analysis. JAMA Neurol 2018.

Dichgans M, Leys D. Vascular Cognitive Impairment. Circ Res 2017; 120(3): 573-91.

Dichgans M, Pulit SL, Rosand J. Stroke genetics: discovery, biology, and clinical applications. Lancet Neurol 2019.

European Stroke Organisation Executive C, Committee ESOW. Guidelines for management of ischaemic stroke and transient ischaemic attack 2008. Cerebrovasc Dis 2008; 25(5): 457-507.

Ference BA, Ginsberg HN, Graham I, Ray KK, Packard CJ, Bruckert E*, et al.* Low-density lipoproteins cause atherosclerotic cardiovascular disease. 1. Evidence from genetic, epidemiologic, and clinical studies. A consensus statement from the European Atherosclerosis Society Consensus Panel. Eur Heart J 2017a; 38(32): 2459-72.

Ference BA, Kastelein JJP, Ginsberg HN, Chapman MJ, Nicholls SJ, Ray KK*, et al.* Association of Genetic Variants Related to CETP Inhibitors and Statins With Lipoprotein Levels and Cardiovascular Risk. JAMA 2017b; 318(10): 947-56.

Ference BA, Kastelein JJP, Ray KK, Ginsberg HN, Chapman MJ, Packard CJ*, et al.* Association of Triglyceride-Lowering LPL Variants and LDL-C-Lowering LDLR Variants With Risk of Coronary Heart Disease. JAMA 2019a; 321(4): 364-73.

Ference BA, Majeed F, Penumetcha R, Flack JM, Brook RD. Effect of naturally random allocation to lower low-density lipoprotein cholesterol on the risk of coronary heart disease mediated by polymorphisms in NPC1L1, HMGCR, or both: a 2 x 2 factorial Mendelian randomization study. J Am Coll Cardiol 2015; 65(15): 1552-61.

Ference BA, Ray KK, Catapano AL, Ference TB, Burgess S, Neff DR*, et al.* Mendelian Randomization Study of ACLY and Cardiovascular Disease. N Engl J Med 2019b; 380(11): 1033-42.

Ference BA, Robinson JG, Brook RD, Catapano AL, Chapman MJ, Neff DR*, et al.* Variation in PCSK9 and HMGCR and Risk of Cardiovascular Disease and Diabetes. N Engl J Med 2016; 375(22): 2144-53.

Ference BA, Yoo W, Alesh I, Mahajan N, Mirowska KK, Mewada A*, et al.* Effect of long-term exposure to lower low-density lipoprotein cholesterol beginning early in life on the risk of coronary heart disease: a Mendelian randomization analysis. J Am Coll Cardiol 2012; 60(25): 2631-9.

Fung KY, Wang C, Nyegaard S, Heit B, Fairn GD, Lee WL. SR-BI Mediated Transcytosis of HDL in Brain Microvascular Endothelial Cells Is Independent of Caveolin, Clathrin, and PDZK1. Front Physiol 2017; 8: 841.

Garner B, Waldeck AR, Witting PK, Rye KA, Stocker R. Oxidation of high density lipoproteins. II. Evidence for direct reduction of lipid hydroperoxides by methionine residues of apolipoproteins AI and AII. J Biol Chem 1998; 273(11): 6088-95.

Genomes Project C, Abecasis GR, Auton A, Brooks LD, DePristo MA, Durbin RM*, et al.* An integrated map of genetic variation from 1,092 human genomes. Nature 2012; 491(7422): 56-65.

Georgakis MK, Duering M, Wardlaw JM, Dichgans M. WMH and long-term outcomes in ischemic stroke: A systematic review and meta-analysis. Neurology 2019.

Gill D, Georgakis MK, Koskeridis F, Feng Q, Wei W-Q, Theodoratou E*, et al.* Genetic variants related to the blood pressure lowering effect of antihypertensive targets inform drug efficacy and side effects. Submitted 2018.

Goldstein JL, Brown MS. A century of cholesterol and coronaries: from plaques to genes to statins. Cell 2015; 161(1): 161-72.

Goldstein LB, Amarenco P, Szarek M, Callahan A, 3rd, Hennerici M, Sillesen H, *et al.* Hemorrhagic stroke in the Stroke Prevention by Aggressive Reduction in Cholesterol Levels study. Neurology 2008; 70(24 Pt 2): 2364-70.

Harrison SC, Holmes MV, Burgess S, Asselbergs FW, Jones GT, Baas AF, *et al.* Genetic Association of Lipids and Lipid Drug Targets With Abdominal Aortic Aneurysm: A Meta-analysis. JAMA Cardiol 2018; 3(1): 26-33.

Hartwig FP, Davey Smith G, Bowden J. Robust inference in summary data Mendelian randomization via the zero modal pleiotropy assumption. International journal of epidemiology 2017; 46(6): 1985-98.

Hegele RA. CETP Inhibitors - A New Inning? N Engl J Med 2017; 377(13): 1284-5.

Hindy G, Engstrom G, Larsson SC, Traylor M, Markus HS, Melander O, *et al.* Role of Blood Lipids in the Development of Ischemic Stroke and its Subtypes: A Mendelian Randomization Study. Stroke 2018; 49(4): 820-7.

Holmes MV, Ala-Korpela M, Smith GD. Mendelian randomization in cardiometabolic disease: challenges in evaluating causality. Nat Rev Cardiol 2017; 14(10): 577-90.

Holmes MV, Asselbergs FW, Palmer TM, Drenos F, Lanktree MB, Nelson CP, *et al.* Mendelian randomization of blood lipids for coronary heart disease. Eur Heart J 2015; 36(9): 539-50.

Holmes MV, Millwood IY, Kartsonaki C, Hill MR, Bennett DA, Boxall R, *et al.* Lipids, Lipoproteins, and Metabolites and Risk of Myocardial Infarction and Stroke. J Am Coll Cardiol 2018; 71(6): 620-32.

Hopewell JC, Clarke R. Emerging Risk Factors for Stroke: What Have We Learned From Mendelian Randomization Studies? Stroke; a journal of cerebral circulation 2016; 47(6): 1673-8.

Hopewell JC, Malik R, Valdes-Marquez E, Worrall BB, Collins R, ISGC MCot. Differential effects of PCSK9 variants on risk of coronary disease and ischaemic stroke. Eur Heart J 2018; 39(5): 354-9.

Hosomi N, Nagai Y, Kohriyama T, Ohtsuki T, Aoki S, Nezu T, *et al.* The Japan Statin Treatment Against Recurrent Stroke (J-STARS): A Multicenter, Randomized, Open-label, Parallel-group Study. EBioMedicine 2015; 2(9): 1071-8.

HPS3/TIMI55–REVEAL Collaborative Group, Bowman L, Hopewell JC, Chen F, Wallendszus K, Stevens W, *et al.* Effects of Anacetrapib in Patients with Atherosclerotic Vascular Disease. N Engl J Med 2017; 377(13): 1217-27.

Iadecola C, Duering M, Hachinski V, Joutel A, Pendlebury ST, Schneider J, *et al.* State-of-the-art-review: Vascular cognitive impairment and dementia. J Am Coll Cardiol (In Press) 2019.

Intercollegiate Stroke Working Party. National clinical guideline for stroke. 5th Ed. ed. London: Royal College of Physicians; 2016.

Joshi PH, Toth PP, Lirette ST, Griswold ME, Massaro JM, Martin SS, *et al.* Association of high-density lipoprotein subclasses and incident coronary heart disease: The Jackson Heart and Framingham Offspring Cohort Studies. Eur J Prev Cardiol 2016; 23(1): 41-9.

Kernan WN, Ovbiagele B, Black HR, Bravata DM, Chimowitz MI, Ezekowitz MD, *et al.* Guidelines for the prevention of stroke in patients with stroke and transient ischemic attack: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke 2014; 45(7): 2160-236.

Kettunen J, Demirkan A, Wurtz P, Draisma HH, Haller T, Rawal R, *et al.* Genome-wide study for circulating metabolites identifies 62 loci and reveals novel systemic effects of LPA. Nat Commun 2016; 7: 11122.

Khera AV, Kathiresan S. Genetics of coronary artery disease: discovery, biology and clinical translation. Nat Rev Genet 2017; 18(6): 331-44.

Klarin D, Damrauer SM, Cho K, Sun YV, Teslovich TM, Honerlaw J, *et al.* Genetics of blood lipids among ~300,000 multi-ethnic participants of the Million Veteran Program. Nat Genet 2018; 50(11): 1514-23.

Konishi M, Iso H, Komachi Y, Iida M, Shimamoto T, Jacobs DR, Jr., *et al.* Associations of serum total cholesterol, different types of stroke, and stenosis distribution of cerebral arteries. The Akita Pathology Study. Stroke 1993; 24(7): 954-64.

Kontush A, Chapman MJ. Antiatherogenic function of HDL particle subpopulations: focus on antioxidative activities. Curr Opin Lipidol 2010; 21(4): 312-8.

Lammie GA. Pathology of small vessel stroke. Br Med Bull 2000; 56(2): 296-306.

Lapergue B, Moreno JA, Dang BQ, Coutard M, Delbosc S, Raphaeli G, *et al.* Protective effect of high-density lipoprotein-based therapy in a model of embolic stroke. Stroke 2010; 41(7): 1536-42.

Lee CM, Chien CT, Chang PY, Hsieh MY, Jui HY, Liau CS, *et al.* High-density lipoprotein antagonizes oxidized low-density lipoprotein by suppressing oxygen free-radical formation and preserving nitric oxide bioactivity. Atherosclerosis 2005; 183(2): 251-8.

Lincoff AM, Nicholls SJ, Riesmeyer JS, Barter PJ, Brewer HB, Fox KAA, *et al.* Evacetrapib and Cardiovascular Outcomes in High-Risk Vascular Disease. N Engl J Med 2017; 376(20): 1933-42.

Malik R, Chauhan G, Traylor M, Sargurupremraj M, Okada Y, Mishra A, *et al.* Multiancestry genome-wide association study of 520,000 subjects identifies 32 loci associated with stroke and stroke subtypes. Nat Genet 2018a; 50(4): 524-37.

Malik R, Rannikmae K, Traylor M, Georgakis MK, Sargurupremraj M, Markus HS, *et al.* Genome-wide meta-analysis identifies 3 novel loci associated with stroke. Ann Neurol 2018b; 84(6): 934-9.

Manktelow BN, Potter JF. Interventions in the management of serum lipids for preventing stroke recurrence. Cochrane Database Syst Rev 2009(3): CD002091.

Martin SS, Jones SR, Toth PP. High-density lipoprotein subfractions: current views and clinical practice applications. Trends Endocrinol Metab 2014; 25(7): 329-36.

Martin SS, Khokhar AA, May HT, Kulkarni KR, Blaha MJ, Joshi PH, *et al.* HDL cholesterol subclasses, myocardial infarction, and mortality in secondary prevention: the Lipoprotein Investigators Collaborative. Eur Heart J 2015; 36(1): 22-30.

Martini SR, Flaherty ML, Brown WM, Haverbusch M, Comeau ME, Sauerbeck LR, *et al.* Risk factors for intracerebral hemorrhage differ according to hemorrhage location. Neurology 2012; 79(23): 2275-82.

Monette JS, Hutchins PM, Ronsein GE, Wimberger J, Irwin AD, Tang C, *et al.* Patients With Coronary Endothelial Dysfunction Have Impaired Cholesterol Efflux Capacity and Reduced HDL Particle Concentration. Circ Res 2016; 119(1): 83-90.

Murphy AJ, Woollard KJ, Hoang A, Mukhamedova N, Stirzaker RA, McCormick SP, *et al.* High-density lipoprotein reduces the human monocyte inflammatory response. Arterioscler Thromb Vasc Biol 2008; 28(11): 2071-7.

Nicholls SJ, Dusting GJ, Cutri B, Bao S, Drummond GR, Rye KA, *et al.* Reconstituted high-density lipoproteins inhibit the acute pro-oxidant and proinflammatory vascular changes induced by a periarterial collar in normocholesterolemic rabbits. Circulation 2005; 111(12): 1543-50.

Nofer JR, van der Giet M, Tolle M, Wolinska I, von Wnuck Lipinski K, Baba HA, *et al.* HDL induces NO-dependent vasorelaxation via the lysophospholipid receptor S1P3. J Clin Invest 2004; 113(4): 569-81.

Nowak C, Arnlov J. A Mendelian randomization study of the effects of blood lipids on breast cancer risk. Nat Commun 2018; 9(1): 3957.

O'Donnell CJ, Sabatine MS. Opportunities and Challenges in Mendelian Randomization Studies to Guide Trial Design. JAMA Cardiol 2018; 3(10): 967.

Palmer TM, Lawlor DA, Harbord RM, Sheehan NA, Tobias JH, Timpson NJ, *et al.* Using multiple genetic variants as instrumental variables for modifiable risk factors. Stat Methods Med Res 2012; 21(3): 223-42.

Pantoni L. Cerebral small vessel disease: from pathogenesis and clinical characteristics to therapeutic challenges. Lancet Neurol 2010; 9(7): 689-701.

Prosser HC, Ng MK, Bursill CA. The role of cholesterol efflux in mechanisms of endothelial protection by HDL. Curr Opin Lipidol 2012; 23(3): 182-9.

Qureshi AI, Mendelow AD, Hanley DF. Intracerebral haemorrhage. Lancet 2009; 373(9675): 1632-44.

Qureshi AI, Tuhrim S, Broderick JP, Batjer HH, Hondo H, Hanley DF. Spontaneous intracerebral hemorrhage. N Engl J Med 2001; 344(19): 1450-60.

Ray KK, Bays HE, Catapano AL, Lalwani ND, Bloedon LT, Sterling LR, *et al.* Safety and Efficacy of Bempedoic Acid to Reduce LDL Cholesterol. N Engl J Med 2019; 380(11): 1022-32.

Rutten-Jacobs LCA, Tozer DJ, Duering M, Malik R, Dichgans M, Markus HS, *et al.* Genetic Study of White Matter Integrity in UK Biobank (N=8448) and the Overlap With Stroke, Depression, and Dementia. Stroke 2018; 49(6): 1340-7.

Schwartz GG, Olsson AG, Abt M, Ballantyne CM, Barter PJ, Brumm J, *et al.* Effects of dalcetrapib in patients with a recent acute coronary syndrome. N Engl J Med 2012; 367(22): 2089-99.

Sorrentino SA, Besler C, Rohrer L, Meyer M, Heinrich K, Bahlmann FH, *et al.* Endothelial-vasoprotective effects of high-density lipoprotein are impaired in patients with type 2 diabetes mellitus but are improved after extended-release niacin therapy. Circulation 2010; 121(1): 110-22.

Spieker LE, Sudano I, Hurlimann D, Lerch PG, Lang MG, Binggeli C, *et al.* High-density lipoprotein restores endothelial function in hypercholesterolemic men. Circulation 2002; 105(12): 1399-402.

Stroke Foundation. Clinical Guidelines for Stroke Management Melbourne, Australia; 2017.

Sudlow CL, Warlow CP. Comparable studies of the incidence of stroke and its pathological types: results from an international collaboration. International Stroke Incidence Collaboration. Stroke 1997; 28(3): 491-9.

Sun L, Clarke R, Bennett D, Guo Y, Walters RG, Hill M, *et al.* Causal associations of blood lipids with risk of ischemic stroke and intracerebral hemorrhage in Chinese adults. Nat Med 2019; 25(4): 569-74.

Superko HR, Pendyala L, Williams PT, Momary KM, King SB, 3rd, Garrett BC. High-density lipoprotein subclasses and their relationship to cardiovascular disease. J Clin Lipidol 2012; 6(6): 496-523.

Terasaka N, Wang N, Yvan-Charvet L, Tall AR. High-density lipoprotein protects macrophages from oxidized low-density lipoprotein-induced apoptosis by promoting efflux of 7-ketocholesterol via ABCG1. Proc Natl Acad Sci U S A 2007; 104(38): 15093-8.

Tran-Dinh A, Diallo D, Delbosc S, Varela-Perez LM, Dang QB, Lapergue B, *et al.* HDL and endothelial protection. Br J Pharmacol 2013; 169(3): 493-511.

Viswambharan H, Ming XF, Zhu S, Hubsch A, Lerch P, Vergeres G, *et al.* Reconstituted high-density lipoprotein inhibits thrombin-induced endothelial tissue factor expression through inhibition of RhoA and stimulation of phosphatidylinositol 3-kinase but not Akt/endothelial nitric oxide synthase. Circ Res 2004; 94(7): 918-25.

Voight BF, Peloso GM, Orho-Melander M, Frikke-Schmidt R, Barbalic M, Jensen MK, *et al.* Plasma HDL cholesterol and risk of myocardial infarction: a mendelian randomisation study. Lancet 2012; 380(9841): 572-80.

Wang X, Dong Y, Qi X, Huang C, Hou L. Cholesterol levels and risk of hemorrhagic stroke: a systematic review and meta-analysis. Stroke 2013; 44(7): 1833-9.

Wardlaw JM, Smith C, Dichgans M. Mechanisms of sporadic cerebral small vessel disease: insights from neuroimaging. Lancet Neurol 2013; 12(5): 483-97.

Wardlaw JM, Smith C, M. D. Small vessel disease: mechanisms and clinical implications. Lancet Neurol (In Press) 2019.

White J, Swerdlow DI, Preiss D, Fairhurst-Hunter Z, Keating BJ, Asselbergs FW*, et al.* Association of Lipid Fractions With Risks for Coronary Artery Disease and Diabetes. JAMA Cardiol 2016; 1(6): 692-9.

Willer CJ, Schmidt EM, Sengupta S, Peloso GM, Gustafsson S, Kanoni S*, et al.* Discovery and refinement of loci associated with lipid levels. Nat Genet 2013; 45(11): 1274-83.

Williams PT. Low high-density lipoprotein 3 reduces the odds of men surviving to age 85 during 53-year follow-up. J Am Geriatr Soc 2012; 60(3): 430-6.

Woo D, Falcone GJ, Devan WJ, Brown WM, Biffi A, Howard TD*, et al.* Meta-analysis of genome-wide association studies identifies 1q22 as a susceptibility locus for intracerebral hemorrhage. Am J Hum Genet 2014; 94(4): 511-21.

Wurtz P, Havulinna AS, Soininen P, Tynkkynen T, Prieto-Merino D, Tillin T*, et al.* Metabolite profiling and cardiovascular event risk: a prospective study of 3 population-based cohorts. Circulation 2015; 131(9): 774-85.

Yin ZG, Wang QS, Yu K, Wang WW, Lin H, Yang ZH. Sex differences in associations between blood lipids and cerebral small vessel disease. Nutr Metab Cardiovasc Dis 2018; 28(1): 28-34.

Yu S, Yarnell JW, Sweetnam P, Bolton CH. High density lipoprotein subfractions and the risk of coronary heart disease: 9-years follow-up in the Caerphilly Study. Atherosclerosis 2003; 166(2): 331-8.

Yuhanna IS, Zhu Y, Cox BE, Hahner LD, Osborne-Lawrence S, Lu P*, et al.* High-density lipoprotein binding to scavenger receptor-BI activates endothelial nitric oxide synthase. Nat Med 2001; 7(7): 853-7.

Zhu Z, Zheng Z, Zhang F, Wu Y, Trzaskowski M, Maier R*, et al.* Causal associations between risk factors and common diseases inferred from GWAS summary data. Nat Commun 2018; 9(1): 224.

Figure 1. Mendelian randomization (MR) associations of genetically determined blood lipid levels (HDL-C, LDL-C, TG) with risk of small vessel stroke and WMH volume. Shown are the results derived from random-effects IVW MR and multivariable MR (MVMR) analyses adjusting for the effects of the genetic variants on all the three blood lipid traits.

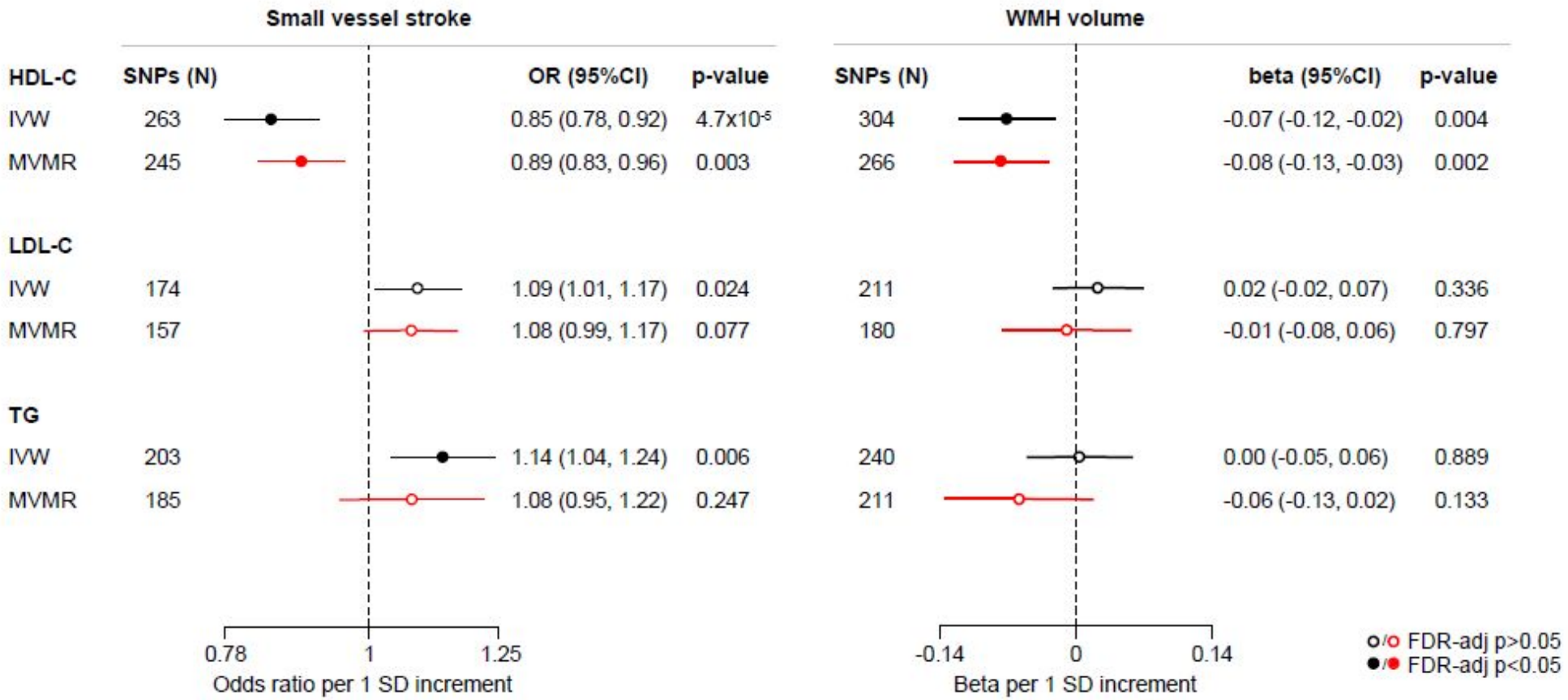
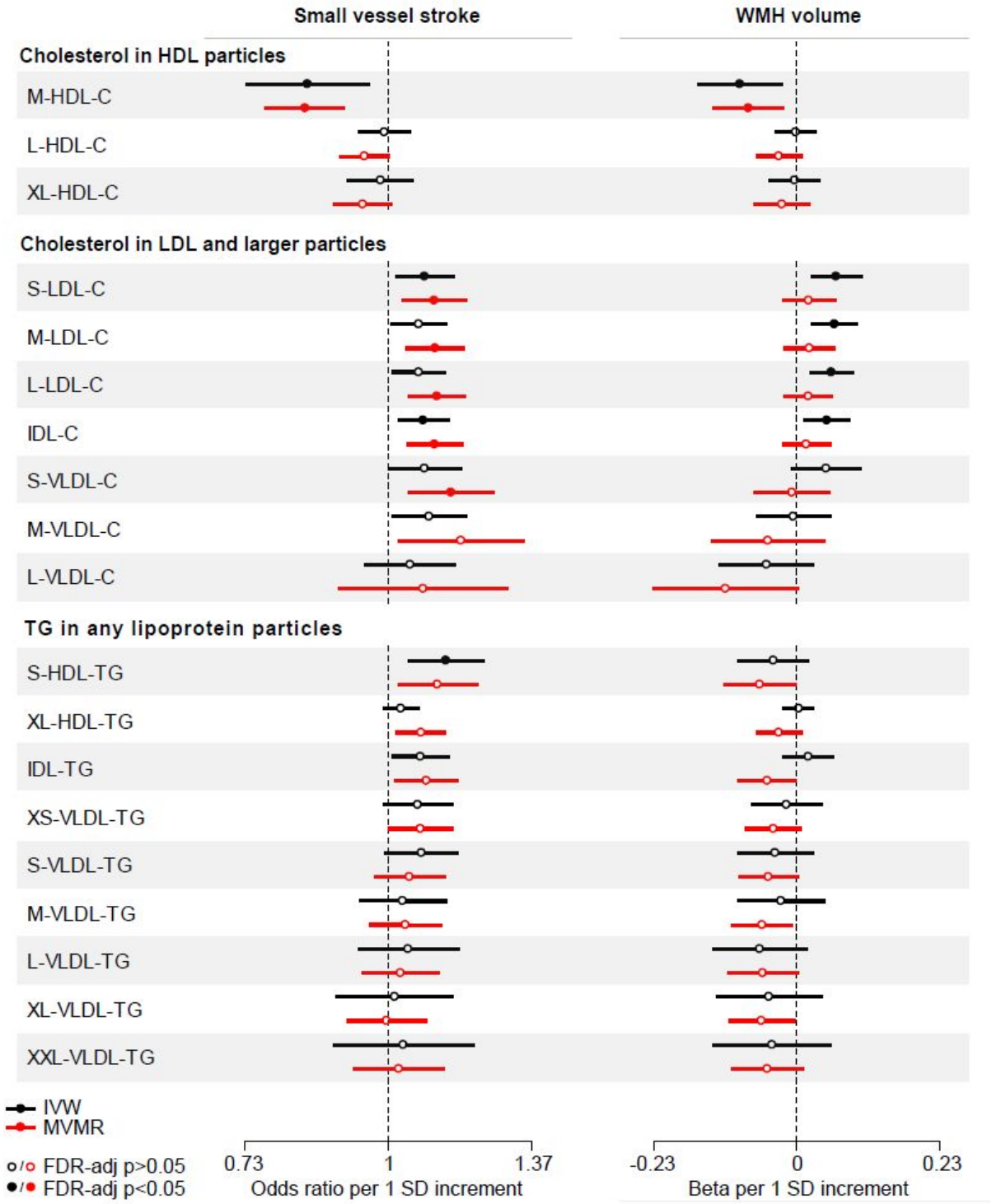


Figure 2. Mendelian randomization (MR) associations of genetically determined cholesterol (C) and triglyceride (TG) concentrations in size-defined lipoprotein particles with risk of small vessel stroke and WMH volume. Shown are the results derived from random-effects inverse-variance weighted (IVW) MR and multivariable MR (MVMR) analyses.



* MVMR for cholesterol in HDL particles adjusted for LDL-C and TG; for cholesterol in LDL and larger particles adjusted for HDL-C and TG; and for TG in any particles adjusted for HDL-C and LDL-C.

Figure 3. Mendelian randomization (MR) associations of genetically determined HDL-C with risk of small vessel stroke and WMH volume, when (A) using the full set of genetic instruments and (B) when restricting the analyses to instruments also associated with cholesterol concentration in medium-sized HDL. Shown are the results derived from random-effects inverse-variance weighted (IVW), weighted median and MR-Egger analyses.

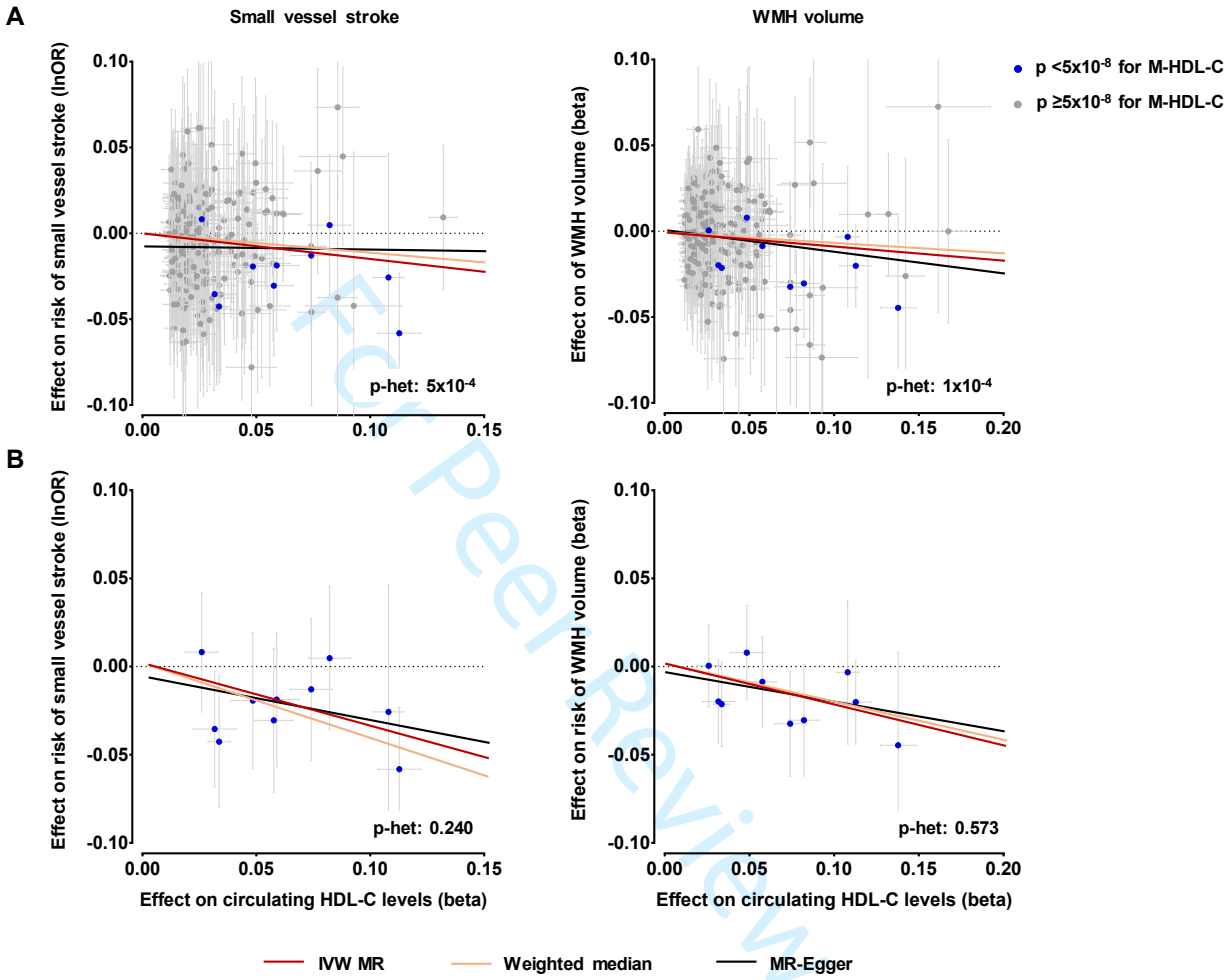


Figure 4. Mendelian randomization associations of genetic instruments used as proxies for HDL-C-raising and LDL-C-lowering drug targets with risk of small vessel stroke and WMH volume. Shown are the results derived from random-effects inverse-variance weighted (IVW) MR analyses. The results are scaled per 1 SD increment in circulating HDL-C levels for the HDL-C-raising proxies and per 1 SD increment in circulating LDL-C levels for the LDL-C-lowering proxies, respectively.

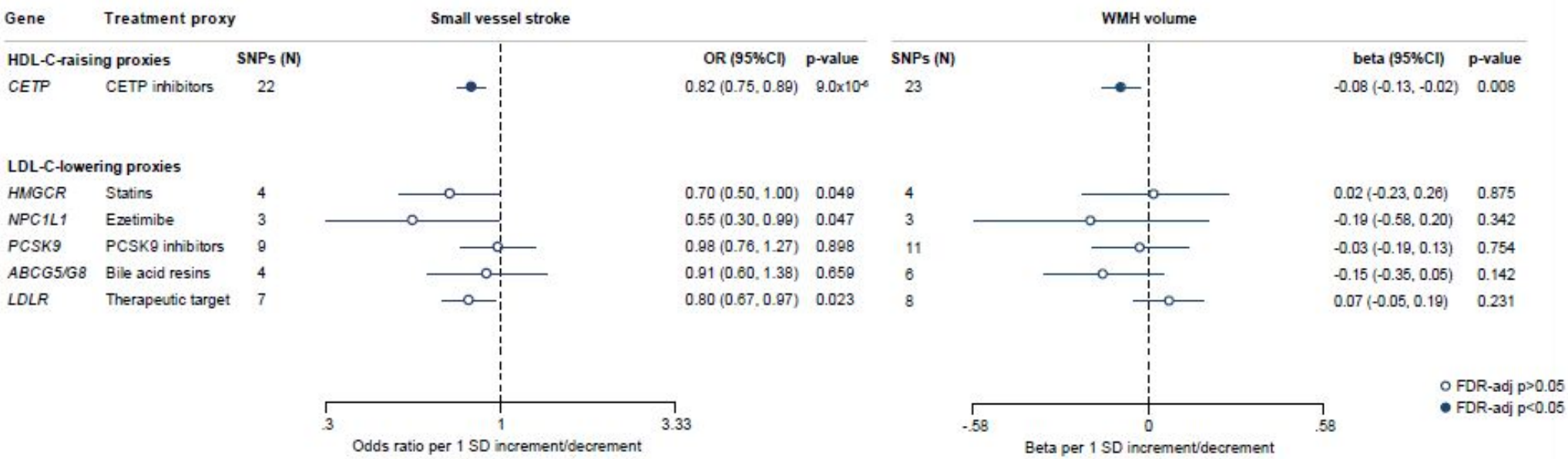


Figure 5. Mendelian randomization (MR) associations between HDL-C-raising genetic proxies for CETP inhibitors and (A) risk of small vessel stroke, (B) WMH volume, and (C) risk of ICH. Shown are the results from the random-effects inverse-variance weighted MR approach. The results are scaled per 1 SD increment in circulating HDL-C levels.

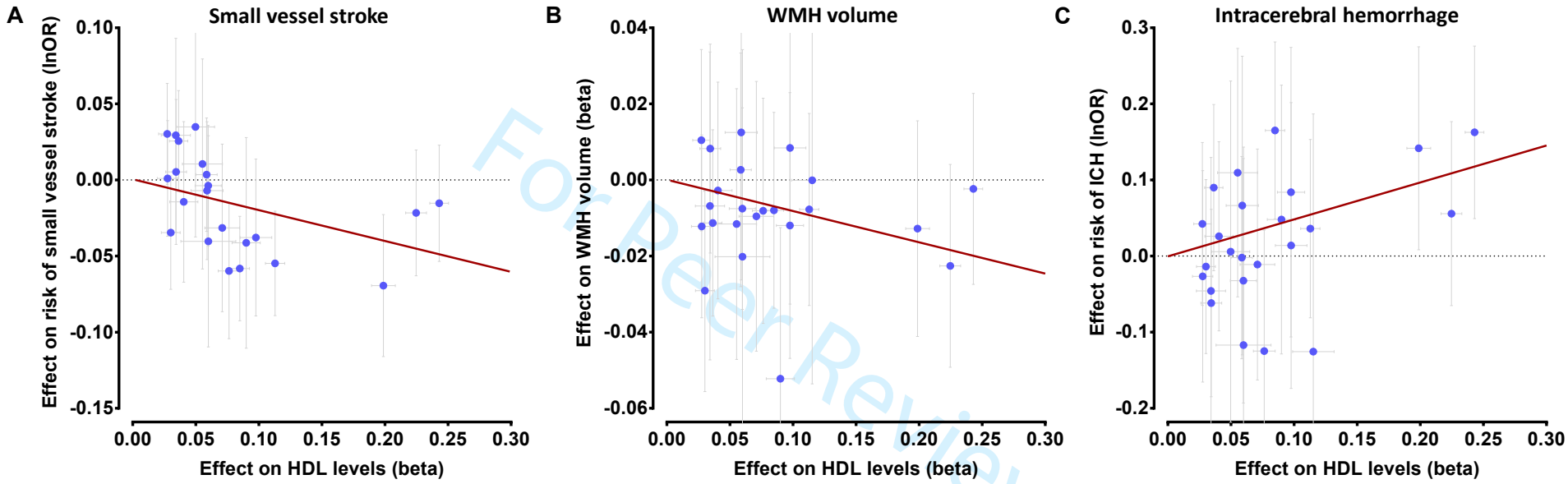
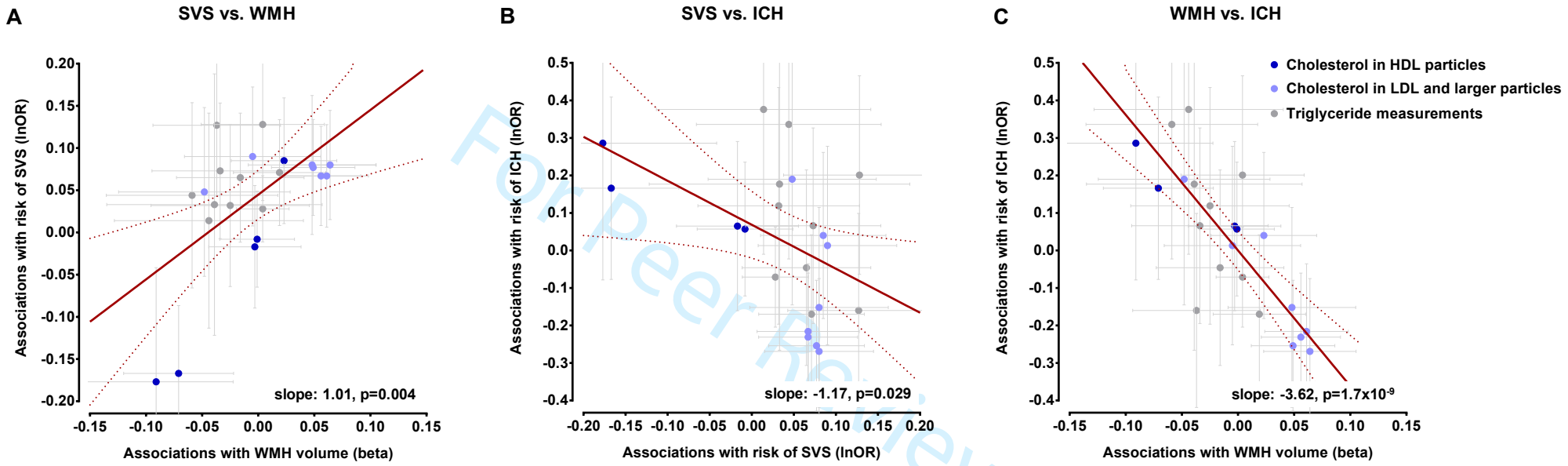


Figure 6. Comparisons of association estimates for genetically determined lipid traits (blood lipid levels and concentrations of lipoprotein particle components) between small vessel stroke, WMH volume, and ICH. Shown are the meta-regression slopes for the comparisons of (A) small vessel stroke and WMH volume, (B) small vessel stroke and ICH, and (C) WMH volume and ICH. Estimates are scaled per 1 SD increment.



SUPPLEMENTARY ONLINE CONTENT

Genetically determined blood lipids and cerebral small vessel disease: role of HDL cholesterol

Table of contents

Supplementary Table 1. Descriptive characteristics of the genome-wide association studies (GWAS) that were included in our Mendelian randomization analysis.

GWAS	Phenotype	Sample size	Ancestry	Adjustments[a]
Instrument selection				
GLGC & MVP	HDL-C, LDL-C, TG	617,303 individuals	Multi-ancestry	age, age^2, sex
GLGC	HDL-C, LDL-C, TG (for lipid-modifying drug targets & sensitivity analyses)	188,577 individuals	Multi-ancestry	age, age^2, sex
NMR-measured metabolite GWAS	Lipoprotein particle components	24,925 individuals	European	age, sex, time from last meal
Examined outcomes				
MEGASTROKE	Small vessel stroke	11,710 cases; 287,067 controls	Multi-ancestry	age, sex
UK Biobank	WMH volume	10,597 individuals	European (White British)	age, sex
ISGC ICH	ICH and subtypes (lobar, deep ICH)	1,537 cases/ 1,490 controls	European	age, sex

[a] All GWAS studies have further adjusted for principal components.

Abbreviations. GLGC, global lipids genetics consortium; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; MVP, Million Veteran Program; NMR, Nuclear Magnetic Resonance; TG, triglycerides.

Supplementary Table 6. Power calculations for the Mendelian randomization analyses performed in the current study.

Lipid trait	Variance explained (R^2) [a]	Maximum / Minimum association estimate [b] for 1-β >0.80		
		Small vessel stroke	WMH volume	Intracerebral hemorrhage
Sample		298,777	10,597	3,026
Number of cases		11,710		1,545
Blood lipid levels		OR	beta (max / min)	OR (max / min)
HDL-C	12.4%	≤0.93 & ≥1.08	≤-0.06 / ≥0.06	≤0.75 / ≥1.33
LDL-C	11.6%	≤0.93 / ≥1.08	≤-0.07/ ≥0.07	≤0.74 / ≥1.35
TG	9.31%	≤0.92 / ≥1.09	≤-0.09 / ≥0.09	≤0.71 / ≥1.40
Lipid drug targets [c]				
CETP	9.43%	≤0.92 / ≥1.09	≤-0.09 / ≥0.09	≤0.72 / ≥1.39
HMGCR	0.48%	≤0.72 / ≥1.39	≤-0.39 / ≥0.39	≤0.25 / ≥3.97
NPC1L1	0.18%	≤0.58 / ≥1.68	≤-0.64 / ≥0.64	≤0.12 / ≥8.03
PCSK9	1.11%	≤0.79 / ≥1.26	≤-0.26 / ≥0.26	≤0.39 / ≥2.57
ABCG5/G8	0.74%	≤0.76 / ≥1.31	≤-0.32 / ≥0.32	≤0.32 / ≥3.13
LDLR	1.87%	≤0.83 / ≥1.20	≤-0.20 / ≥0.20	≤0.48 / ≥2.08
PPARA	-	-	-	-
ANGPTL3	0.21%	≤0.63 / ≥1.59	≤-0.60 / ≥0.60	≤0.14 / ≥7.09
ANGPTL4	-	-	-	-
APOC3	2.25%	≤0.85 / ≥1.18	≤-0.19 / ≥0.19	≤0.51 / ≥1.95
LPL	1.65%	≤0.83 / ≥1.21	≤-0.22 / ≥0.22	≤0.46 / ≥2.18
Lipoprotein particle components				
S.HDL.TG	8.89%	≤0.92 / ≥1.09	≤-0.09 / ≥0.09	≤0.71 / ≥1.41
M.HDL.C	4.37%	≤0.88 / ≥1.13	≤-0.13 / ≥0.13	≤0.62 / ≥1.62
L.HDL.C	21.5%	≤0.94 / ≥1.06	≤-0.05 / ≥0.05	≤0.81 / ≥1.25
XL.HDL.C	13.9%	≤0.93 / ≥1.07	≤-0.06 / ≥0.06	≤0.76 / ≥1.32
XL.HDL.TG	47.8%	≤0.96 / ≥1.04	≤-0.04 / ≥0.04	≤0.86 / ≥1.16
S.LDL.C	35.9%	≤0.95 / ≥1.05	≤-0.05 / ≥0.05	≤0.84 / ≥1.19
M.LDL.C	42.2%	≤0.95 / ≥1.05	≤-0.04 / ≥0.04	≤0.85 / ≥1.17
L.LDL.C	45.7%	≤0.96 / ≥1.04	≤-0.04 / ≥0.04	≤0.86 / ≥1.16
IDL.C	42.1%	≤0.95 / ≥1.05	≤-0.04 / ≥0.04	≤0.85 / ≥1.17
IDL.TG	30.8%	≤0.95 / ≥1.05	≤-0.05 / ≥0.05	≤0.83 / ≥1.21
XS.VLDL.TG	17.4%	≤0.93 / ≥1.07	≤-0.06 / ≥0.06	≤0.78 / ≥1.28
S.VLDL.C	16.3%	≤0.93 / ≥1.07	≤-0.06 / ≥0.06	≤0.78 / ≥1.29
S.VLDL.TG	10.8%	≤0.93 / ≥1.08	≤-0.08 / ≥0.08	≤0.73 / ≥1.37
M.VLDL.C	11.6%	≤0.93 / ≥1.08	≤-0.07 / ≥0.07	≤0.74 / ≥1.35
M.VLDL.TG	7.86%	≤0.91 / ≥1.10	≤-0.10 / ≥0.10	≤0.69 / ≥1.44
L.VLDL.C	7.04%	≤0.91 / ≥1.10	≤-0.11 / ≥0.11	≤0.68 / ≥1.47
L.VLDL.TG	5.49%	≤0.89 / ≥1.12	≤-0.12 / ≥0.12	≤0.65 / ≥1.54
XL.VLDL.TG	4.40%	≤0.88 / ≥1.13	≤-0.13 / ≥0.13	≤0.62 / ≥1.62
XXL.VLDL.TG	3.30%	≤0.87 / ≥1.15	≤-0.15 / ≥0.15	≤0.57 / ≥1.74

Shown are the rages of associations estimates that could be detected with a power of 1-β>0.8 and at a statistical significance threshold of α<0.05.

[a] $R^2 = (beta\ x\ \sqrt{2\ x\ MAF(1-MAF)})^2$, where MAF is the minimum allele frequency and beta is the effect of the SNP on the respective cytokine levels (Park et al 2010, Nat. Genet. 42, 570–575).

[b] Odds Ratios are presented for the binary outcomes (small vessel stroke, intracerebral hemorrhage) and beta coefficients for the continuous outcomes (white matter hyperintensities volume).

[c] The R^2 for CETP, HMGCR, NPC1L1, PCSK9, ABCG5/G8, LDLR, PPARA, ANGPTL3, ANGPTL4, APOC3, and LPL drug targets correspond to the variance explained by variants in these loci for HDL-C, LDL-C, TG levels, as appropriately.

Supplementary Table 7. Mendelian randomization (MR) association estimates of cholesterol and triglyceride concentrations across lipoprotein particles with small vessel stroke and WMH volume. Shown are the results derived from IVW MR analyses.

	Small vessel stroke				WMH volume			
Outcome	**SNPs (N)**	**OR (95%CI)**	**p-value**	**p-het**	**SNPs (N)**	**beta (95%CI)**	**p-value**	**p-het**
Cholesterol in HDL particles								
M.HDL.C	8	0.84 (0.73-0.96)	**0.007**	0.183	10	-0.09 (-0.16 to -0.02)	**0.009**	0.232
L.HDL.C	42	0.99 (0.94-1.05)	0.781	0.509	54	0.00 (-0.03 to 0.03)	0.930	0.443
XL.HDL.C	30	0.98 (0.91-1.06)	0.646	0.044	36	0.00 (-0.04 to 0.04)	0.884	0.915
Cholesterol in LDL and larger particles								
S.LDL.C	36	1.08 (1.02-1.15)	**0.010**	0.539	46	0.06 (0.02 to 0.11)	**0.002**	0.012
M.LDL.C	36	1.07 (1.01-1.14)	0.030	0.716	49	0.06 (0.02 to 0.10)	**0.002**	0.027
L.LDL.C	40	1.07 (1.01-1.13)	0.022	0.614	57	0.06 (0.02 to 0.09)	**0.002**	0.095
IDL.C	42	1.08 (1.02-1.14)	**0.008**	0.589	42	0.05 (0.01 to 0.09)	**0.008**	0.027
S.VLDL.C	26	1.08 (1.00-1.18)	0.057	0.186	31	0.05 (-0.01 to 0.10)	0.091	0.367
M.VLDL.C	24	1.09 (1.01-1.19)	0.033	0.137	24	-0.01 (-0.07 to 0.06)	0.866	0.472
L.VLDL.C	17	1.05 (0.95-1.16)	0.354	0.116	17	-0.05 (-0.12 to 0.03)	0.215	0.791
Triglycerides in lipoprotein particles								
S.HDL.TG	25	**1.14 (1.04-1.23)**	**0.003**	0.175	31	-0.04 (-0.09 to 0.02)	0.200	0.018
XL.HDL.TG	76	1.03 (0.99-1.07)	0.165	0.437	88	0.00 (-0.02 to 0.03)	0.744	0.846
IDL.TG	41	1.07 (1.01-1.14)	0.027	0.685	41	0.02 (-0.02 to 0.06)	0.355	0.013
XS.VLDL.TG	27	1.07 (0.99-1.15)	0.095	0.325	28	-0.02 (-0.07 to 0.04)	0.568	0.039
S.VLDL.TG	26	1.08 (0.99-1.17)	0.074	0.164	26	-0.03 (-0.09 to 0.03)	0.264	0.177
M.VLDL.TG	18	1.03 (0.94-1.14)	0.509	0.162	21	-0.03 (-0.10 to 0.05)	0.486	0.857
L.VLDL.TG	15	1.04 (0.94-1.17)	0.432	0.029	15	-0.06 (-0.14 to 0.02)	0.131	0.663
XL.VLDL.TG	12	1.01 (0.89-1.15)	0.829	0.108	14	-0.04 (-0.13 to 0.04)	0.315	0.878
XXL.VLDL.TG	8	1.03 (0.89-1.21)	0.673	0.213	10	-0.04 (-0.14 to 0.06)	0.432	0.751

Bold indicates p-values <0.05 after adjustment for false discovery rate (FDR).

Odds Ratios correspond to 1 SD increment in the corresponding variable. P-het values correspond to the p-value of the Cochran's Q statistic exploring heterogeneity across the estimates.

Supplementary Table 8. Multivariable Mendelian randomization (MR) association estimates of cholesterol and triglyceride concentrations across lipoprotein particles with small vessel stroke and WMH volume.

	Small vessel stroke		WMH volume	
Outcome	**OR (95%CI)**	**p-value**	**beta (95%CI)**	**p-value**
Cholesterol in HDL particles [adjusted for LDL-C and TG]				
M.HDL.C	0.83 (0.76-0.91)	**$4.3x10^{-5}$**	-0.08 (-0.13 to -0.02)	**0.008**
L.HDL.C	0.95 (0.90-1.00)	0.063	-0.03 (-0.07 to 0.01)	0.145
XL.HDL.C	0.95 (0.89-1.01)	0.090	-0.02 (-0.07 to 0.02)	0.314
Cholesterol in LDL and larger particles [adjusted for HDL-C and TG]				
S.LDL.C	1.11 (1.03-1.19)	**0.004**	0.02 (-0.02 to 0.06)	0.366
M.LDL.C	1.11 (1.04-1.18)	**0.002**	0.02 (-0.02 to 0.06)	0.325
L.LDL.C	1.11 (1.04-1.19)	**0.001**	0.02 (-0.02 to 0.06)	0.338
IDL.C	1.11 (1.04-1.18)	**0.001**	0.02 (-0.02 to 0.05)	0.413
S.VLDL.C	1.15 (1.04-1.26)	**0.005**	-0.01 (-0.07 to 0.05)	0.821
M.VLDL.C	1.17 (1.02-1.35)	0.024	-0.05 (-0.14 to 0.05)	0.326
L.VLDL.C	1.08 (0.90-1.30)	0.420	-0.11 (-0.23 to 0.00)	0.058
TG in any lipoprotein particles [adjusted for HDL-C and LDL-C]				
S.HDL.TG	1.11 (1.02-1.22)	0.016	-0.06 (-0.12 to 0.00)	0.047
XL.HDL.TG	1.07 (1.02-1.14)	0.010	-0.03 (-0.07 to 0.01)	0.132
IDL.TG	1.09 (1.01-1.17)	0.018	-0.05 (-0.09 to 0.00)	0.051
XS.VLDL.TG	1.07 (1.00-1.15)	0.052	-0.04 (-0.08 to 0.01)	0.117
S.VLDL.TG	1.05 (0.97-1.13)	0.242	-0.04 (-0.09 to 0.00)	0.072
M.VLDL.TG	1.04 (0.96-1.13)	0.362	-0.06 (-0.10 to -0.01)	0.030
L.VLDL.TG	1.03 (0.94-1.12)	0.524	-0.05 (-0.11 to 0.00)	0.063
XL.VLDL.TG	1.00 (0.91-1.09)	0.937	-0.06 (-0.11 to 0.00)	0.038
XXL.VLDL.TG	1.02 (0.93-1.13)	0.646	-0.05 (-0.11 to 0.01)	0.117

Bold indicates p-values <0.05 after adjustment for false discovery rate (FDR).

Odds Ratios correspond to 1 SD increment in the corresponding variable.

For the multivariable MR analyses we used a genetic score for HDL-C, LDL-C and larger particle cholesterol, and for TGT, by combining all unique instruments significantly associated with HDL-C or cholesterol concentrations in HDL particles, LDL-C or cholesterol concentrations in LDL and larger ApoB particles, and with TG or triglyceride concentrations in any TG particles, respectively.

Supplementary Table 9. Mendelian randomization (MR) association estimates of cholesterol and triglyceride concentrations across lipoprotein particles with small vessel stroke and WMH volume, as derived from alternative MR methods in case of heterogeneity (p<0.10 in Cochran's Q) in the IVW analysis. Shown are the results derived from weighed median and MR-Egger analyses.

Small vessel stroke	MR method	OR	SE	95%CI		p-value
XL.HDL.C	IVW	0.96	0.062	0.85	1.09	0.537
	Weighted median	1.02	0.068	0.90	1.17	0.731
	MR Egger	0.95	0.212	0.63	1.44	0.812
	Egger Intercept	1.00	0.023	0.96	1.05	0.952
L.VLDL.TG	IVW	1.05	0.077	0.90	1.22	0.536
	Weighted median	1.01	0.079	0.86	1.18	0.910
	MR Egger	1.13	0.206	0.76	1.69	0.549
	Egger Intercept	0.99	0.022	0.95	1.03	0.690
WMH volume	**MR method**	**beta**	**SE**	**95%CI**		**p-value**
S.LDL.C	IVW	0.066	0.027	0.013	0.118	0.014
	Weighted median	0.054	0.03	-0.005	0.114	0.072
	MR Egger	0.098	0.05	0.000	0.197	0.050
	Egger Intercept	-0.005	0.006	-0.017	0.008	0.438
M.LDL.C	IVW	0.063	0.024	0.017	0.110	0.008
	Weighted median	0.088	0.032	0.026	0.150	0.006
	MR Egger	0.101	0.043	0.017	0.185	0.019
	Egger Intercept	-0.006	0.006	-0.017	0.005	0.292
L.LDL.C	IVW	0.058	0.021	0.017	0.099	0.005
	Weighted median	0.065	0.03	0.005	0.124	0.033
	MR Egger	0.099	0.037	0.027	0.171	0.007
	Egger Intercept	-0.007	0.005	-0.016	0.003	0.172
IDL.C	IVW	0.050	0.023	0.005	0.095	0.028
	Weighted median	0.053	0.027	0.000	0.106	0.051
	MR Egger	0.114	0.041	0.033	0.195	0.006
	Egger Intercept	-0.009	0.005	-0.018	0.001	0.067
IDL.TG	IVW	0.021	0.027	-0.031	0.073	0.428
	Weighted median	0.013	0.036	-0.056	0.083	0.710
	MR Egger	0.082	0.066	-0.047	0.211	0.214
	Egger Intercept	-0.008	0.008	-0.023	0.007	0.313
XS.VLDL.TG	IVW	-0.016	0.037	-0.088	0.056	0.667
	Weighted median	0.002	0.044	-0.084	0.088	0.964
	MR Egger	-0.036	0.119	-0.268	0.196	0.762
	Egger Intercept	0.002	0.012	-0.022	0.026	0.858

Odds Ratios correspond to 1 SD increment in the corresponding variable.

Supplementary Table 10. Mendelian randomization (MR) association estimates of HDL-C raising variants in/close to the *CEPT* locus, and risk of small vessel stroke, as derived from alternative MR methods. Shown are the results derived from weighed median and MR-Egger analyses, because the IVW MR analysis showed significant heterogeneity.

Small vessel stroke	MR method	OR	95%CI	p-value
HDL-C raising variants in *CETP*	IVW MR	0.82	(0.75-0.89)	0.001
	Weighted median	0.81	(0.68-0.96)	0.014
	MR Egger	0.71	(0.57-0.89)	0.003
	Egger Intercept	1.01	(0.99-1.03)	0.404

Odds Ratios correspond to 1 SD increment in HDL-C for the *CETP* variants.

Supplementary Table 11. Mendelian randomization (MR) association estimates of cholesterol and triglyceride concentrations across lipoprotein particles with intracerebral hemorrhage. Shown are the results derived from IVW MR and multivariable MR analyses.

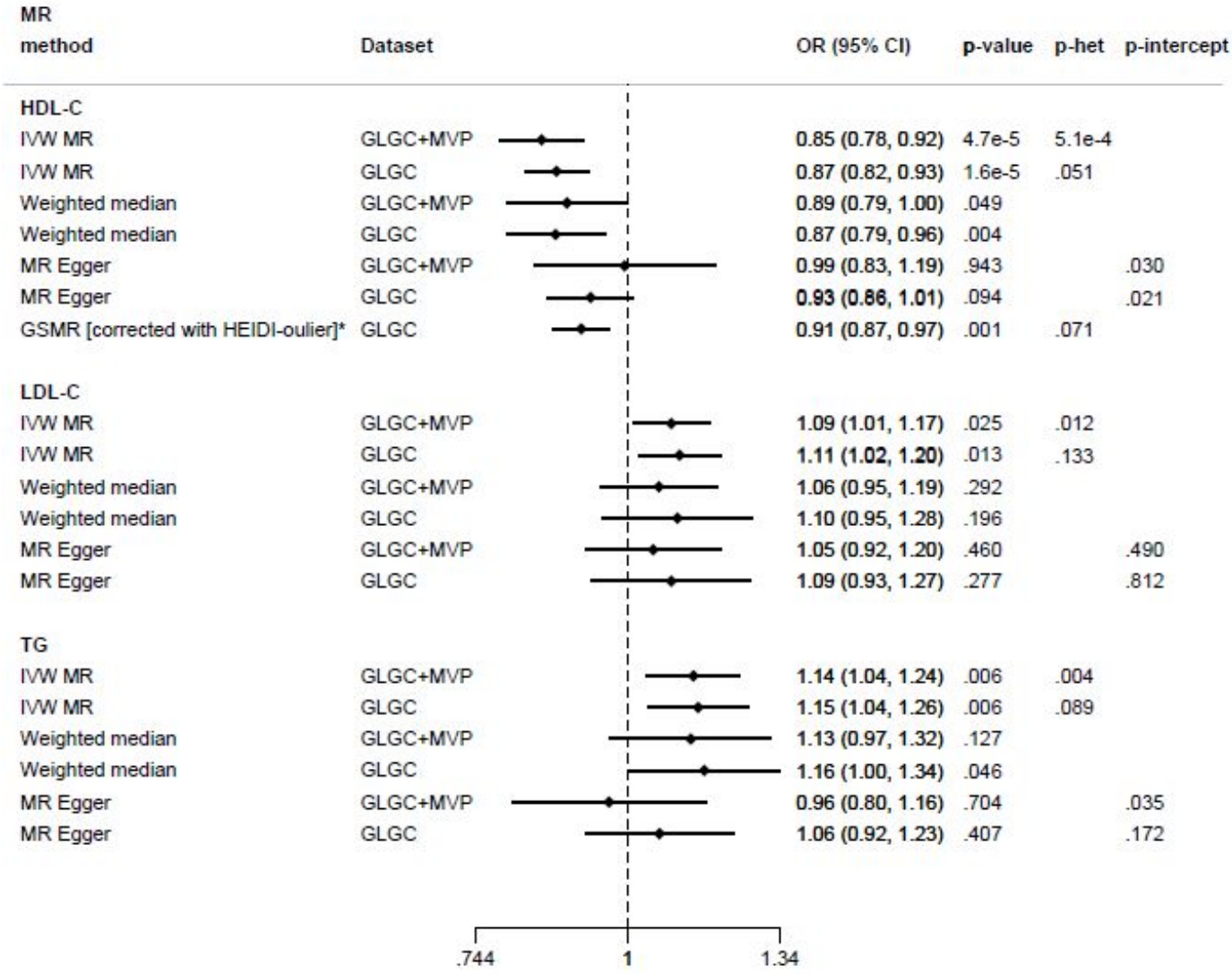
		IVW MR			Multivariable MR	
Outcome	**SNPs (N)**	**OR (95%CI)**	**p-value**	**p-het**	**OR (95%CI)**	**p-value**
Cholesterol in HDL particles [adjusted for LDL-C and TG]						
M.HDL.C	8	1.33 (0.92-1.92)	0.124	0.183	1.51 (1.17-1.95)	**0.001**
L.HDL.C	42	1.06 (0.89-1.26)	0.534	0.509	1.09 (0.93-1.29)	0.295
XL.HDL.C	30	1.07 (0.85-1.34)	0.570	0.044	1.15 (0.94-1.40)	0.172
Cholesterol in LDL and larger particles [adjusted for HDL-C and TG]						
S.LDL.C	36	0.76 (0.63-0.93)	**0.007**	0.702	0.84 (0.69-1.01)	0.066
M.LDL.C	36	0.81 (0.67-0.97)	0.019	0.472	0.85 (0.71-1.02)	0.088
L.LDL.C	40	0.79 (0.67-0.94)	**0.008**	0.283	0.83 (0.70-0.99)	0.036
IDL.C	42	0.78 (0.65-0.92)	**0.004**	0.589	0.78 (0.66-0.93)	**0.004**
S.VLDL.C	26	0.86 (0.66-1.12)	0.264	0.040	0.80 (0.61-1.05)	0.106
M.VLDL.C	24	1.01 (0.78-1.32)	0.923	0.074	0.90 (0.60-1.34)	0.592
L.VLDL.C	17	1.21 (0.86-1.69)	0.267	0.035	0.87 (0.51-1.49)	0.614
Triglycerides in any lipoprotein particle [adjusted for HDL-C and LDL-C]						
S.HDL.TG	25	0.85 (0.66-1.10)	0.223	0.175	1.14 (0.87-1.50)	0.346
XL.HDL.TG	76	0.93 (0.82-1.06)	0.291	0.437	0.94 (0.79-1.12)	0.477
IDL.TG	41	0.84 (0.68-1.04)	0.117	0.171	0.88 (0.70-1.10)	0.265
S.VLDL.TG	26	1.07 (0.82-1.39)	0.620	0.095	1.05 (0.84-1.31)	0.665
XS.VLDL.TG	27	0.96 (0.74-1.24)	0.732	0.156	1.09 (0.87-1.37)	0.447
M.VLDL.TG	18	1.13 (0.82-1.54)	0.458	0.050	1.23 (0.97-1.54)	0.085
L.VLDL.TG	15	1.40 (0.98-2.00)	0.065	0.249	1.26 (0.99-1.60)	0.055
XL.VLDL.TG	12	1.46 (0.99-2.14)	0.056	0.145	1.25 (0.97-1.60)	0.081
XXL.VLDL.TG	8	1.19 (0.77-1.86)	0.434	0.124	1.22 (0.92-1.61)	0.165

Bold indicates p-values <0.05 after adjustment for false discovery rate (FDR).

Odds Ratios correspond to 1 SD increment in the corresponding variable. P-het values correspond to the p-value of the Cochran's Q statistic exploring heterogeneity across the estimates.

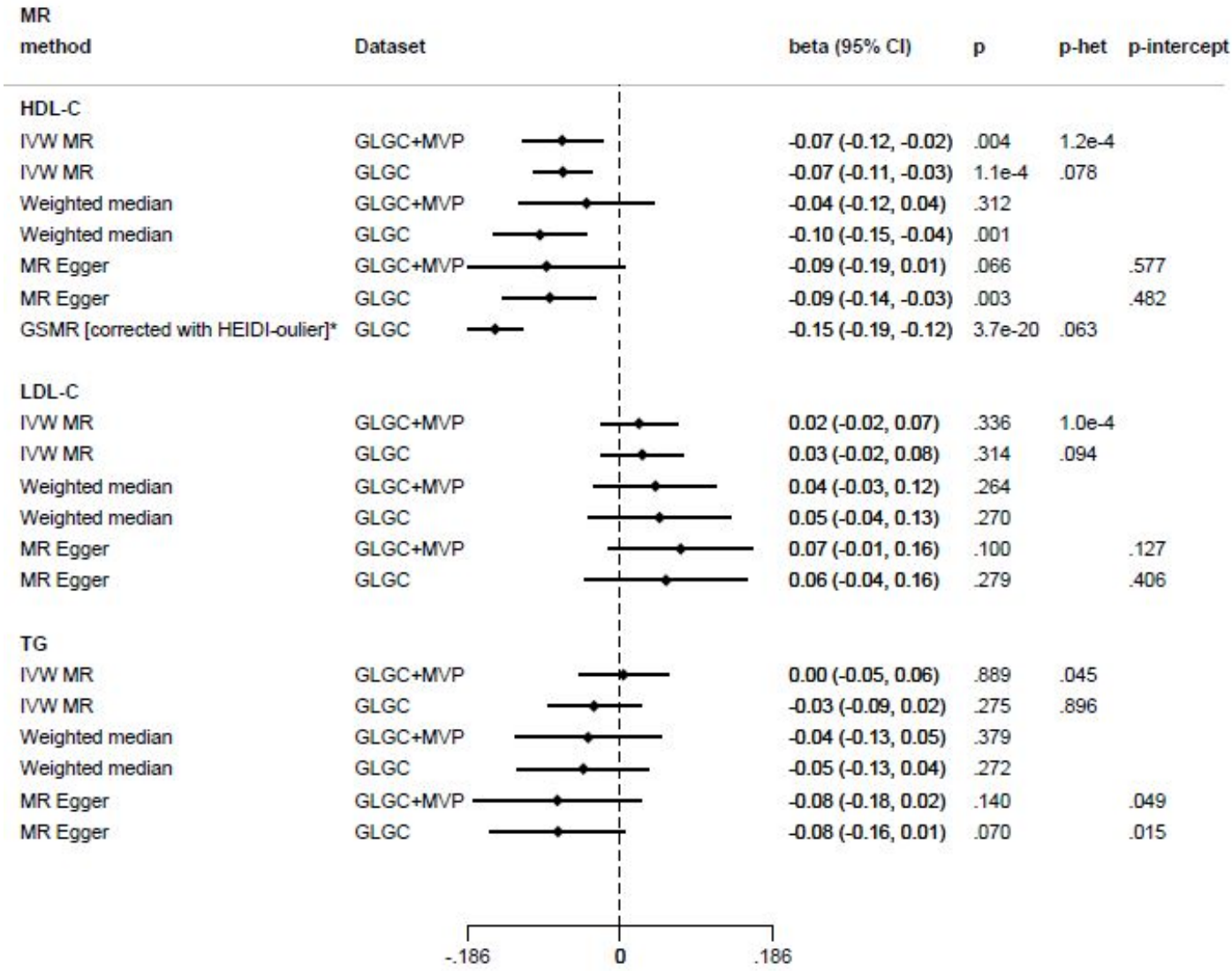
For the multivariable MR analyses we used a genetic score for HDL-C, LDL-C and larger particle cholesterol, and for triglycerides, by combining all unique instruments significantly associated with HDL-C or cholesterol concentrations in HDL particles, LDL-C or cholesterol concentrations in LDL and larger ApoB particles, and with TG or triglyceride concentrations in any TG particles. For the concentration of cholesterol in HDL particles, we have performed adjustments for LDL-C and TG, for concentration of cholesterol in LDL and larger ApoB particles, we have performed adjustments for HDL-C and TG, and for triglyceride concentrations we have performed adjustments for HDL-C and LDL-C.

Supplementary Figure 1. Sensitivity Mendelian randomization (MR) analyses between genetically determined blood lipid levels (HDL-C, LDL-C, TG) with risk of small vessel stroke. Shown are the results derived from IVW MR, weighted median, MR-Egger, and the GSMR approach incorporated with the HEIDI-outlier detector. The genetic instruments are weighted either based on the estimates derived from the full GLGC+MVP sample, or form those derived from the restricted GLGC dataset, where patients under lipid-modifying treatment had been excluded.



GLGC: global lipids genetics consortium; MVP: millions veteran program.
* the HEIDI-outlier approach detected rs11875988, rs11065979, and rs12417015 as outliers and excluded them from the analyses
p-het: derived from the Cochran Q statistic for the IVW analyses and from the global heterogeneity test for the GSMR analyses.
p-interecept: statistical significance of the intercept derived from MR-Egger regression analyses

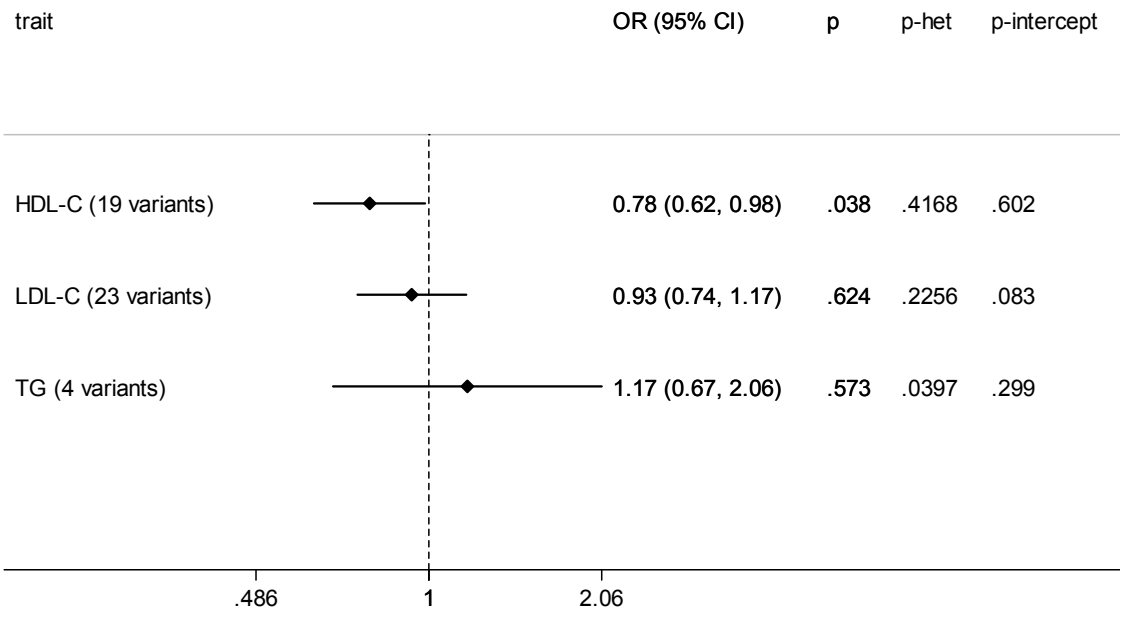
Supplementary Figure 2. Sensitivity Mendelian randomization (MR) analyses between genetically determined blood lipid levels (HDL-C, LDL-C, TG) with WMH volume. Shown are the results derived from IVW MR, weighted median, MR-Egger, and the GSMR approach incorporated with the HEIDI-outlier detector. The genetic instruments are weighted either based on the estimates derived from the full GLGC+MVP sample, or form those derived from the restricted GLGC dataset, where patients under lipid-modifying treatment had been excluded.



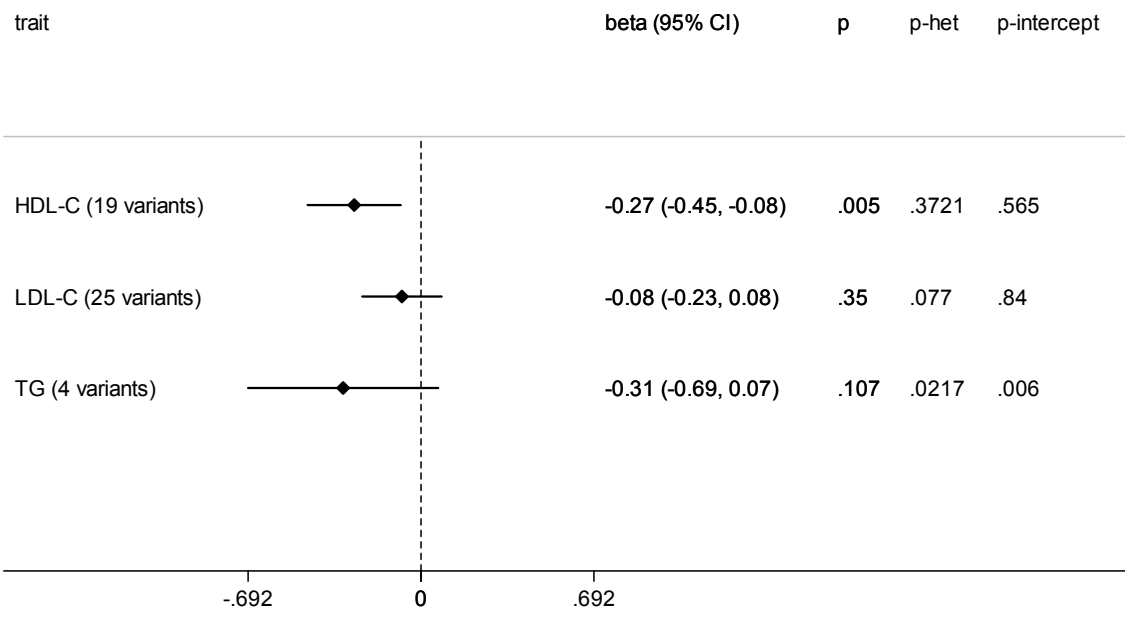
GLGC: global lipids genetics consortium; MVP: millions veteran program.
* the HEIDI-outlier approach detected rs701106 and rs13116385 as outliers and excluded them from the analyses
p-het: derived from the Cochran Q statistic for the IVW analyses and from the global heterogeneity test for the GSMR analyses.
p-interecept: statistical significance of the intercept derived from MR-Egger regression analyses

Supplementary Figure 3. Mendelian randomization (MR) associations between genetically determined blood lipid levels (HDL-C, LDL-C, TG) with (A) risk of small vessel stroke and (B) WMH volume when restricting instrument selection to those specific for the respective traits. Shown are the results derived from IVW MR.

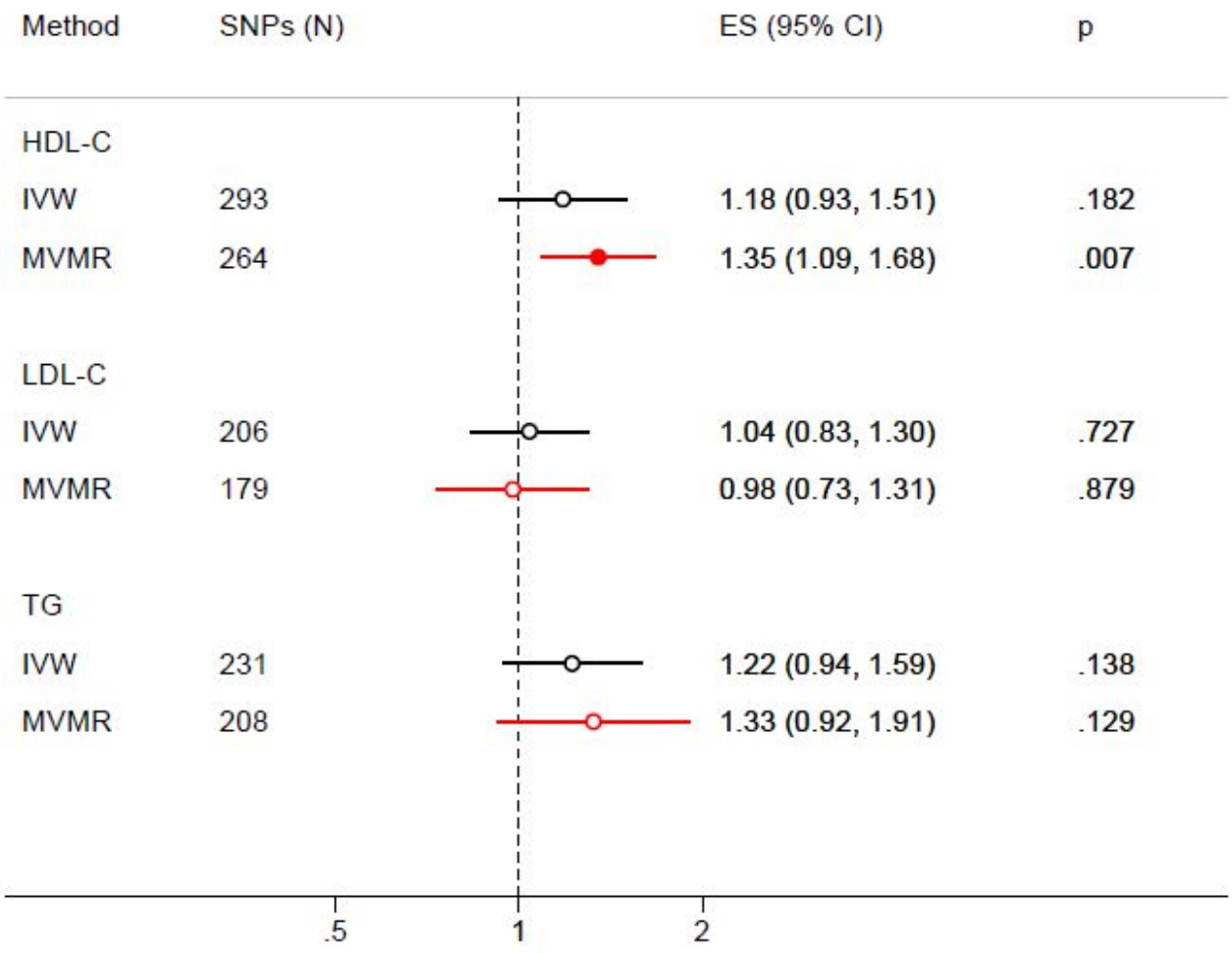
(A) Small vessel stroke



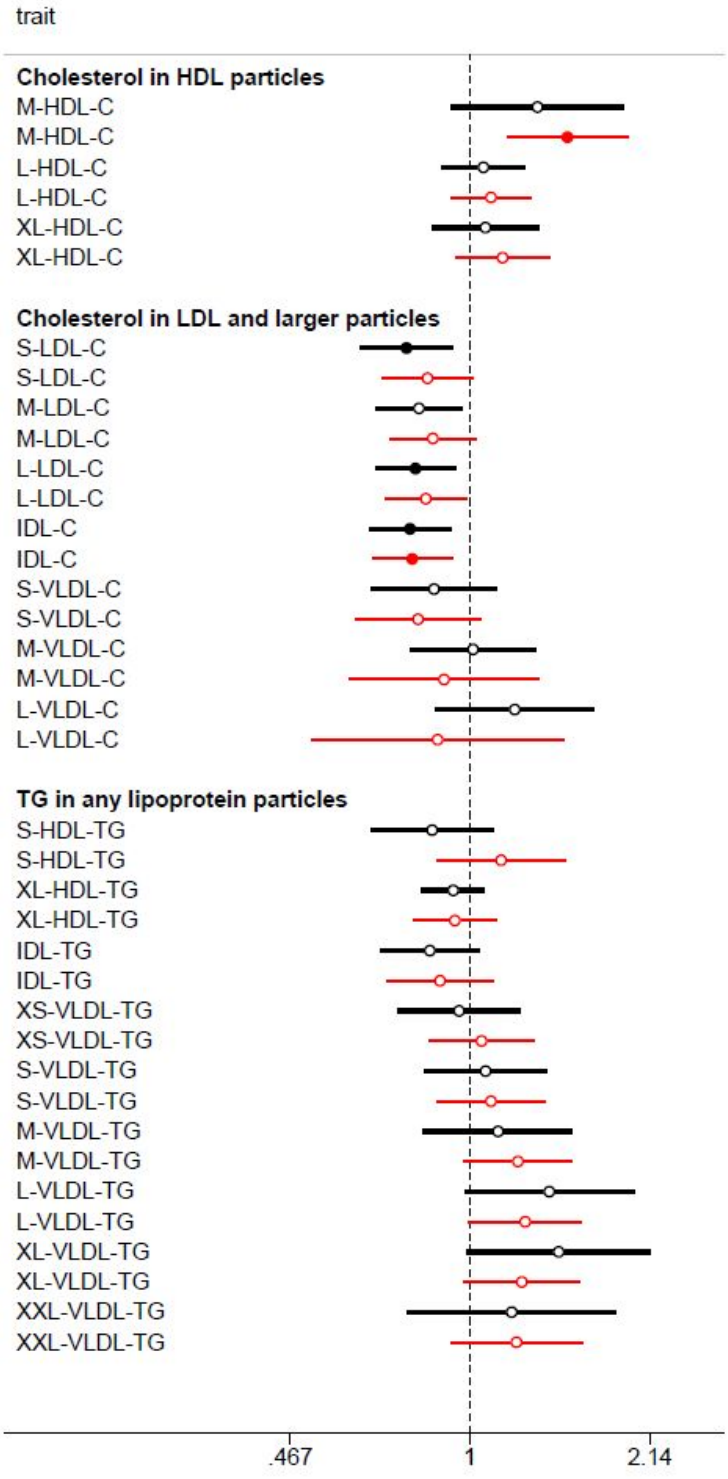
(B) WMH volume



Supplementary Figure 4. Mendelian randomization (MR) associations between genetically determined blood lipid levels (HDL-C, LDL-C, TG) with intracerebral hemorrhage. Shown are the results derived from IVW MR and multivariable MR (MVMR) analysis adjusting for the effects of the genetic variants on all the 3 blood lipid traits.



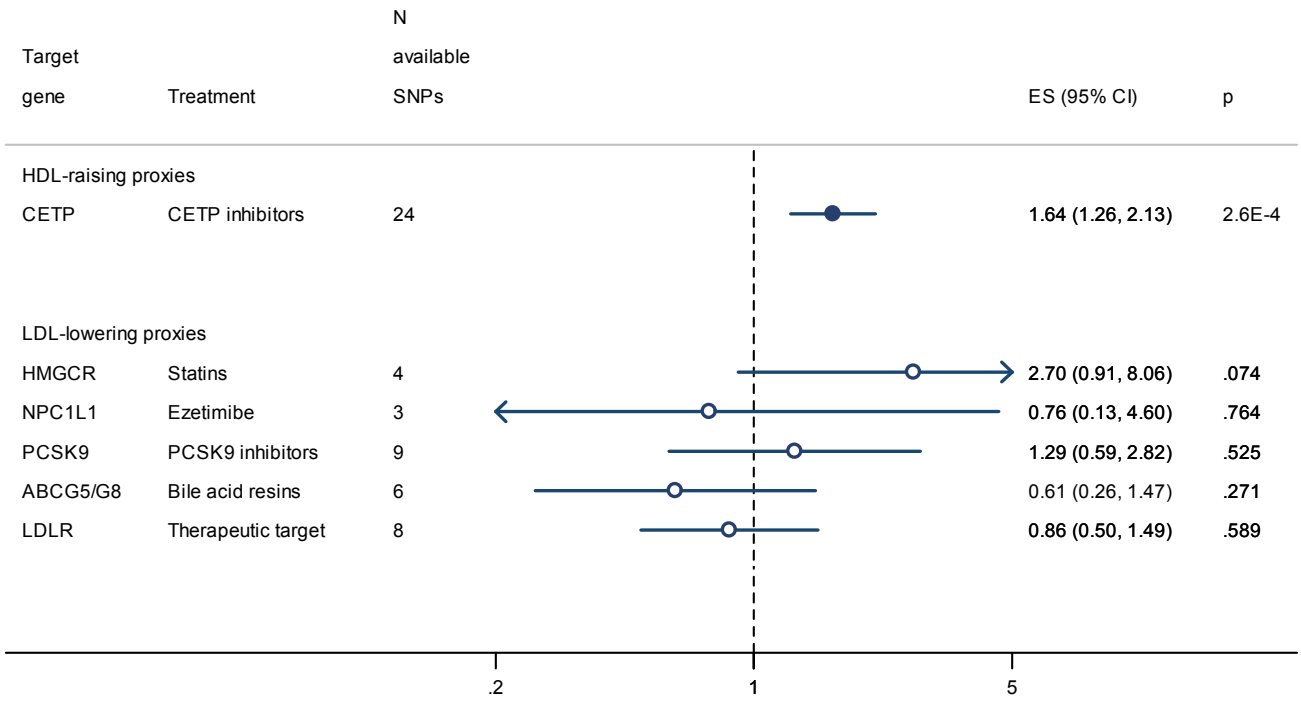
Supplementary Figure 5. Mendelian randomization (MR) associations of cholesterol (C) and triglyceride (TG) concentrations in lipoprotein particles defined by size with intracerebral hemorrhage. Shown are the results derived from IVW MR analyses.



Solid-centre circles indicate association estimates with a q-value <0.05 after adjusting for multiple testing comparisons with the false discovery rate (FDR).

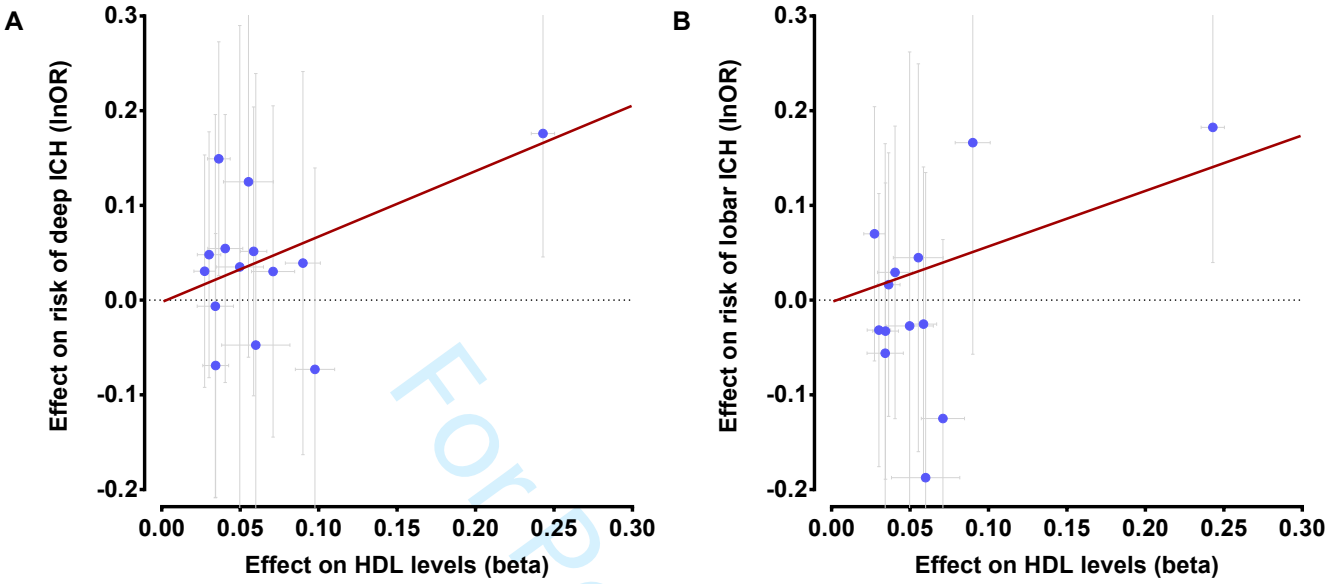
The black point estimates and confidence interval lines correspond to the results of the random-effects IVW MR analyses, whereas the red point estimates and confidence interval lines to the multivariable MR analyses.

Supplementary Figure 6. Mendelian randomization associations between genetic instruments used as proxies for HDL-C-raising and LDL-C-lowering and intracerebral hemorrhage. Shown are the results derived from IVW MR analyses.



The results are scaled per 1 SD increment in circulating HDL-C levels for the HDL-C-raising proxies and per 1 SD increment in circulating LDL- for the LDL-C-lowering proxies, respectively.

Supplementary Figure 7. Mendelian randomization (MR) associations between genetic instruments used as HDL-C-raising proxies for CETP inhibitors and risk of (A) deep and (B) lobar intracerebral hemorrhage (ICH). Shown are the results from the IVW MR analyses. The results are scaled per 1 SD increment in circulating HDL-C levels.



Supplementary Table 2. Genetic instruments for blood lipid levels selected from the meta-analyzed datasets of the Million Veterans Program (MVP) and the Global Lipids Genetics Consortium (GLGC).

Phenotype	SNP	Chr	Position (hg18)	Eff_allele	Effect	SE	P-value	R2	F
HDL-C	rs1767141	1	23734350	a	-0.026	0.004	1.4E-10	0.0001	64.5
HDL-C	rs6668958	1	26902388	t	0.020	0.003	2.3E-12	0.0001	81.0
HDL-C	rs17162330	1	27236212	t	0.041	0.003	1.5E-35	0.0004	258.0
HDL-C	rs12144891	1	28344980	a	0.017	0.003	1.3E-10	0.0001	69.4
HDL-C	rs4660293	1	40028180	a	0.040	0.002	2.5E-62	0.0006	342.9
HDL-C	rs1168089	1	63113719	t	-0.015	0.002	1.8E-10	0.0001	63.6
HDL-C	rs4847399	1	93584606	a	-0.022	0.002	8.3E-25	0.0002	136.2
HDL-C	rs2878349	1	107549245	a	-0.015	0.003	2.1E-09	0.0001	61.3
HDL-C	rs12740374	1	109817590	t	0.045	0.002	9.6E-79	0.0007	430.3
HDL-C	rs7550711	1	110082886	t	-0.049	0.006	1.6E-16	0.0001	82.5
HDL-C	rs28362581	1	110163879	a	-0.028	0.004	4.0E-13	0.0001	67.1
HDL-C	rs333947	1	110470764	a	-0.027	0.003	4.3E-15	0.0002	113.6
HDL-C	rs267738	1	150940625	t	-0.024	0.003	9.9E-22	0.0002	109.5
HDL-C	rs12145743	1	156700651	t	-0.014	0.002	2.0E-10	0.0001	53.0
HDL-C	rs1011731	1	172346548	a	0.013	0.002	1.9E-11	0.0001	54.5
HDL-C	rs4650994	1	178515312	a	-0.019	0.002	4.7E-22	0.0002	115.1
HDL-C	rs2243976	1	182157235	a	0.029	0.002	2.0E-33	0.0004	234.2
HDL-C	rs16856110	1	205631767	a	0.020	0.003	5.0E-10	0.0001	84.0
HDL-C	rs6694509	1	219631981	t	-0.019	0.002	2.6E-17	0.0002	111.2
HDL-C	rs2807834	1	220970593	t	-0.024	0.003	1.8E-21	0.0002	145.1
HDL-C	rs4846914	1	230295691	a	0.047	0.002	9.2E-110	0.0011	663.0
HDL-C	rs1043900	1	230416744	a	0.023	0.003	8.3E-16	0.0002	109.6
HDL-C	rs558971	1	234853406	a	-0.014	0.002	8.1E-09	0.0001	59.1
HDL-C	rs11553746	2	272203	t	0.016	0.002	5.7E-14	0.0001	68.7
HDL-C	rs2867125	2	622827	t	0.017	0.003	3.2E-11	0.0001	52.4
HDL-C	rs4850047	2	3634753	t	0.020	0.003	1.0E-09	0.0001	63.3
HDL-C	rs676210	2	21231524	a	0.062	0.002	4.7E-143	0.0013	787.0
HDL-C	rs562338	2	21288321	a	0.018	0.003	1.8E-12	0.0001	60.7
HDL-C	rs36020289	2	53992622	c	0.046	0.008	2.0E-09	0.0001	43.0
HDL-C	rs12990465	2	65281401	t	0.026	0.003	1.9E-18	0.0003	164.3
HDL-C	rs13389219	2	165528876	t	0.033	0.002	1.2E-54	0.0005	314.9
HDL-C	rs6435161	2	203519783	t	0.018	0.002	1.6E-13	0.0001	82.2
HDL-C	rs2943641	2	227093745	t	0.039	0.002	2.5E-77	0.0007	427.1
HDL-C	rs11712666	3	11619958	a	-0.014	0.002	1.0E-09	0.0001	60.7
HDL-C	rs2067819	3	12359049	a	0.021	0.003	5.6E-14	0.0002	93.9
HDL-C	rs2292101	3	12434901	t	-0.044	0.007	1.8E-11	0.0002	95.1
HDL-C	rs6777217	3	36979042	a	-0.013	0.002	1.1E-10	0.0001	51.0
HDL-C	rs2305637	3	47045846	t	-0.026	0.003	1.1E-19	0.0002	119.1
HDL-C	rs6762477	3	50093209	a	0.023	0.002	2.1E-28	0.0003	162.8
HDL-C	rs13326165	3	52532118	a	0.021	0.003	1.3E-16	0.0001	89.4
HDL-C	rs11242	3	53125922	t	0.015	0.002	2.3E-10	0.0001	68.0
HDL-C	rs35000036	3	123190731	t	-0.013	0.002	3.3E-10	0.0001	50.5
HDL-C	rs1279840	3	136006576	t	0.028	0.003	3.4E-25	0.0003	177.9
HDL-C	rs3773910	3	152171870	c	-0.017	0.003	4.1E-10	0.0001	65.9
HDL-C	rs900399	3	156798732	a	-0.021	0.002	1.4E-26	0.0002	134.2
HDL-C	rs7633675	3	185510613	t	0.013	0.002	2.2E-10	0.0001	49.0
HDL-C	rs4234589	3	185818882	a	0.022	0.003	6.2E-11	0.0001	72.3
HDL-C	rs11248051	4	858332	t	-0.019	0.003	8.5E-09	0.0001	40.8
HDL-C	rs10019888	4	26062990	a	0.024	0.003	4.6E-15	0.0002	102.8
HDL-C	rs293429	4	69591612	t	-0.013	0.002	1.5E-09	0.0001	45.5

HDL-C	rs10023050	4	88064431	a	-0.015	0.002	3.7E-11	0.0001	68.9
HDL-C	rs3822072	4	89741269	a	-0.021	0.002	1.4E-20	0.0002	141.0
HDL-C	rs2602836	4	100014805	a	0.013	0.002	2.0E-10	0.0001	48.7
HDL-C	rs112519623	4	103184239	a	-0.047	0.008	8.8E-09	0.0001	39.8
HDL-C	rs13107325	4	103188709	t	-0.078	0.004	6.3E-80	0.0009	540.0
HDL-C	rs6855363	4	157670537	t	-0.019	0.002	1.3E-14	0.0002	93.2
HDL-C	rs7735253	5	53297611	a	-0.021	0.003	6.5E-16	0.0002	105.7
HDL-C	rs459193	5	55806751	a	0.026	0.002	9.2E-33	0.0003	168.5
HDL-C	rs9686661	5	55861786	t	-0.034	0.003	3.5E-42	0.0004	229.0
HDL-C	rs4976033	5	67714246	a	0.013	0.002	1.8E-11	0.0001	55.1
HDL-C	rs10057967	5	74997756	t	-0.021	0.003	2.8E-14	0.0002	121.3
HDL-C	rs4705986	5	132349654	t	-0.035	0.006	2.0E-09	0.0001	87.9
HDL-C	rs390299	5	153363334	a	-0.015	0.002	4.6E-12	0.0001	60.4
HDL-C	rs2434612	5	158022041	a	0.023	0.003	8.1E-16	0.0002	104.0
HDL-C	rs7730898	5	170459675	a	-0.018	0.003	1.9E-12	0.0001	81.4
HDL-C	rs1265099	6	31105413	a	0.017	0.002	1.2E-16	0.0001	86.2
HDL-C	rs184070214	6	31526080	a	-0.045	0.007	1.5E-09	0.0001	46.8
HDL-C	rs9332739	6	31903804	c	-0.029	0.005	1.8E-09	0.0001	43.9
HDL-C	rs3135006	6	32667119	t	-0.019	0.003	3.0E-13	0.0001	84.9
HDL-C	rs2894342	6	33774394	a	0.015	0.002	1.3E-09	0.0001	46.4
HDL-C	rs1759645	6	34194866	t	0.024	0.003	3.3E-13	0.0002	97.4
HDL-C	rs16885998	6	34268107	t	0.051	0.006	3.0E-16	0.0002	138.8
HDL-C	rs11755393	6	34824636	a	0.030	0.002	5.9E-45	0.0004	262.9
HDL-C	rs41270076	6	35467891	t	0.039	0.006	6.2E-10	0.0001	48.2
HDL-C	rs4711698	6	41987451	t	0.018	0.003	2.8E-11	0.0001	76.4
HDL-C	rs2274517	6	42932715	t	0.016	0.002	1.4E-11	0.0001	74.5
HDL-C	rs6905288	6	43758873	a	-0.030	0.002	5.5E-49	0.0004	262.8
HDL-C	rs35349911	6	43785255	t	-0.014	0.002	1.0E-11	0.0001	57.9
HDL-C	rs881858	6	43806609	a	-0.014	0.002	9.5E-11	0.0001	49.3
HDL-C	rs2754820	6	109246891	a	0.020	0.003	3.1E-09	0.0001	76.6
HDL-C	rs884366	6	109574095	a	-0.014	0.002	8.1E-11	0.0001	54.0
HDL-C	rs3756772	6	116325142	t	0.013	0.002	1.6E-10	0.0001	49.4
HDL-C	rs2745353	6	127452935	t	-0.020	0.002	6.5E-24	0.0002	125.5
HDL-C	rs6925103	6	137076010	t	-0.012	0.002	1.3E-09	0.0001	45.5
HDL-C	rs643381	6	139839423	a	0.021	0.002	2.5E-25	0.0002	133.5
HDL-C	rs41272114	6	161006077	t	0.066	0.006	3.4E-27	0.0003	181.0
HDL-C	rs1652507	6	161082461	t	0.046	0.003	9.6E-51	0.0006	365.4
HDL-C	rs1997243	7	1083777	a	-0.022	0.003	2.2E-15	0.0001	80.2
HDL-C	rs2303361	7	6449496	t	-0.024	0.002	4.1E-23	0.0002	118.6
HDL-C	rs10282707	7	17911038	t	-0.026	0.002	7.6E-32	0.0003	200.3
HDL-C	rs1534696	7	26397239	a	0.019	0.003	1.3E-13	0.0002	104.1
HDL-C	rs2726070	7	36170883	a	-0.017	0.003	2.0E-10	0.0001	90.4
HDL-C	rs4917014	7	50305863	t	-0.014	0.002	5.0E-11	0.0001	50.2
HDL-C	rs1178979	7	72856430	t	-0.034	0.003	6.2E-41	0.0003	206.0
HDL-C	rs11556924	7	129663496	t	0.013	0.002	2.0E-09	0.0001	44.8
HDL-C	rs972283	7	130466854	a	0.028	0.002	2.9E-43	0.0004	233.6
HDL-C	rs3735080	7	150217309	t	-0.014	0.002	2.7E-09	0.0001	41.1
HDL-C	rs7787577	7	150521026	a	0.031	0.005	8.3E-12	0.0002	102.0
HDL-C	rs11774381	8	9183339	t	-0.028	0.003	5.1E-24	0.0003	192.0
HDL-C	rs4841132	8	9183596	a	-0.108	0.003	1.9E-215	0.0020	1207.7
HDL-C	rs9657541	8	10643164	t	-0.025	0.003	3.6E-17	0.0002	124.0
HDL-C	rs1801177	8	19805708	a	-0.120	0.009	2.3E-44	0.0005	324.7
HDL-C	rs264	8	19813180	a	0.033	0.003	6.1E-23	0.0003	161.6

HDL-C	rs268	8	19813529	a	0.238	0.008	5.5E-213	0.0018	1108.5
HDL-C	rs13702	8	19824492	t	-0.059	0.005	4.4E-32	0.0014	890.5
HDL-C	rs17091872	8	19831977	a	-0.056	0.004	2.6E-36	0.0009	573.9
HDL-C	rs2410622	8	19854773	t	-0.026	0.004	1.4E-10	0.0002	113.1
HDL-C	rs6983170	8	19860161	t	0.093	0.010	5.6E-19	0.0005	281.3
HDL-C	rs6651485	8	19861854	a	0.054	0.004	1.9E-36	0.0011	650.1
HDL-C	rs2083637	8	19865175	a	-0.048	0.005	3.5E-22	0.0009	557.7
HDL-C	rs7837677	8	19889872	t	-0.034	0.004	3.8E-16	0.0005	317.9
HDL-C	rs10106652	8	19928160	a	0.031	0.005	4.6E-11	0.0004	230.1
HDL-C	rs34859606	8	19930682	c	-0.019	0.003	9.0E-09	0.0001	70.4
HDL-C	rs6586892	8	19941145	a	0.036	0.004	5.5E-22	0.0006	377.0
HDL-C	rs6983999	8	19955920	a	0.024	0.003	2.3E-15	0.0003	176.9
HDL-C	rs4512408	8	71099094	t	0.026	0.004	5.5E-12	0.0001	80.8
HDL-C	rs2957447	8	106357374	a	0.014	0.002	8.9E-09	0.0001	58.2
HDL-C	rs2293889	8	116599199	t	-0.030	0.002	2.7E-52	0.0004	275.0
HDL-C	rs4871137	8	121868551	t	-0.021	0.002	4.4E-22	0.0002	127.3
HDL-C	rs17405319	8	126449406	t	-0.025	0.003	9.0E-16	0.0002	110.9
HDL-C	rs2954026	8	126484526	t	-0.049	0.002	1.3E-108	0.0010	622.1
HDL-C	rs581080	9	15305378	c	0.037	0.003	1.5E-49	0.0004	266.9
HDL-C	rs13292026	9	107557315	a	-0.044	0.007	4.9E-09	0.0001	66.2
HDL-C	rs2230808	9	107562804	t	-0.024	0.002	3.8E-23	0.0002	129.8
HDL-C	rs76881554	9	107578620	a	-0.164	0.025	3.4E-11	0.0001	56.4
HDL-C	rs2066714	9	107586753	t	-0.051	0.003	3.5E-69	0.0006	398.0
HDL-C	rs3905000	9	107657070	a	-0.055	0.003	6.8E-56	0.0008	477.7
HDL-C	rs10120087	9	107661150	a	0.044	0.004	1.5E-26	0.0004	228.8
HDL-C	rs1800978	9	107665978	c	0.057	0.004	3.7E-52	0.0007	460.3
HDL-C	rs13284054	9	107669073	t	0.054	0.005	1.5E-27	0.0006	375.3
HDL-C	rs1800977	9	107690450	a	0.026	0.003	3.2E-24	0.0003	186.2
HDL-C	rs10733608	9	117148430	t	0.014	0.002	6.3E-09	0.0001	59.9
HDL-C	rs635634	9	136155000	t	0.015	0.003	6.6E-09	0.0001	40.9
HDL-C	rs11255744	10	8601074	t	-0.018	0.003	1.3E-09	0.0001	80.4
HDL-C	rs10904908	10	17260290	a	-0.012	0.002	4.1E-09	0.0001	42.0
HDL-C	rs970548	10	46013277	a	-0.025	0.002	1.7E-26	0.0002	137.0
HDL-C	rs2068888	10	94839642	a	0.021	0.002	1.1E-24	0.0002	128.9
HDL-C	rs2862954	10	101912064	t	-0.017	0.002	6.0E-18	0.0001	90.6
HDL-C	rs2792751	10	113940329	t	0.028	0.002	2.5E-36	0.0003	197.6
HDL-C	rs2148489	10	114048792	t	0.022	0.003	1.8E-15	0.0002	108.0
HDL-C	rs7076938	10	115789375	t	0.017	0.002	5.2E-15	0.0001	73.1
HDL-C	rs140201358	11	823586	c	0.052	0.009	2.8E-09	0.0001	43.3
HDL-C	rs16928809	11	2936952	a	-0.025	0.004	7.7E-12	0.0001	62.1
HDL-C	rs6486121	11	13355770	t	-0.015	0.002	2.5E-10	0.0001	65.3
HDL-C	rs2303975	11	14276999	a	0.019	0.003	1.4E-10	0.0001	49.5
HDL-C	rs925946	11	27667202	t	-0.012	0.002	6.6E-09	0.0001	37.8
HDL-C	rs7927401	11	32481177	t	-0.021	0.003	1.2E-11	0.0002	98.1
HDL-C	rs3824866	11	47258853	t	0.033	0.004	4.4E-19	0.0003	178.2
HDL-C	rs326214	11	47298360	a	-0.025	0.003	1.0E-20	0.0003	162.9
HDL-C	rs10838738	11	47663049	a	0.019	0.002	1.6E-17	0.0002	103.0
HDL-C	rs61897793	11	61599347	a	0.024	0.004	3.7E-09	0.0002	98.3
HDL-C	rs174583	11	61609750	t	-0.042	0.002	1.1E-68	0.0008	498.3
HDL-C	rs35169799	11	64031241	t	-0.040	0.004	5.0E-22	0.0002	109.7
HDL-C	rs644740	11	65561468	t	0.016	0.002	3.9E-12	0.0001	78.0
HDL-C	rs622082	11	68703959	a	0.015	0.002	1.6E-13	0.0001	63.3
HDL-C	rs499974	11	75455021	a	-0.025	0.003	1.5E-22	0.0002	116.6

HDL-C	rs746463	11	109995944	t	-0.017	0.002	6.3E-14	0.0001	71.9
HDL-C	rs180349	11	116611827	a	0.017	0.003	1.8E-10	0.0001	75.4
HDL-C	rs10488698	11	116633947	a	0.045	0.004	1.2E-25	0.0002	131.4
HDL-C	rs964184	11	116648917	c	0.132	0.003	0.0E+00	0.0044	2730.3
HDL-C	rs138326449	11	116701354	a	0.716	0.026	2.1E-170	0.0031	1896.5
HDL-C	rs138407155	11	116707044	a	0.356	0.042	2.4E-17	0.0002	93.6
HDL-C	rs12281729	11	116838130	a	0.077	0.005	3.5E-49	0.0007	402.5
HDL-C	rs10892063	11	116896155	a	0.042	0.003	9.4E-45	0.0008	515.0
HDL-C	rs12269901	11	116973929	c	0.027	0.003	3.3E-23	0.0003	191.3
HDL-C	rs593245	11	117183650	t	0.015	0.002	2.0E-09	0.0001	64.9
HDL-C	rs7941030	11	122522375	t	-0.023	0.002	3.3E-30	0.0002	151.4
HDL-C	rs4937122	11	126228659	t	0.032	0.004	6.0E-13	0.0002	93.7
HDL-C	rs7134375	12	20473758	a	0.022	0.002	6.2E-27	0.0002	139.1
HDL-C	rs7134150	12	20591332	a	-0.031	0.005	6.3E-11	0.0001	76.1
HDL-C	rs4963975	12	26443030	a	-0.020	0.003	2.3E-13	0.0001	88.5
HDL-C	rs1126930	12	49399132	c	-0.037	0.006	2.9E-11	0.0001	52.5
HDL-C	rs784563	12	53866619	t	0.015	0.002	3.1E-11	0.0001	71.5
HDL-C	rs11613352	12	57792580	t	0.023	0.003	5.4E-17	0.0002	110.3
HDL-C	rs2373459	12	101873956	t	0.016	0.002	2.9E-11	0.0001	70.2
HDL-C	rs7298565	12	109937534	a	0.028	0.002	1.8E-44	0.0004	240.9
HDL-C	rs3184504	12	111884608	t	-0.024	0.002	5.0E-31	0.0003	182.5
HDL-C	rs72650673	12	111885310	a	-0.172	0.028	1.4E-09	0.0001	47.2
HDL-C	rs1183910	12	121420807	a	0.013	0.002	1.7E-09	0.0001	43.1
HDL-C	rs12369179	12	122963550	t	-0.031	0.005	3.8E-10	0.0001	92.3
HDL-C	rs1798192	12	123200768	t	-0.019	0.002	3.6E-21	0.0002	113.5
HDL-C	rs940904	12	123491572	a	-0.023	0.003	1.8E-16	0.0002	121.0
HDL-C	rs4759375	12	123796238	t	0.049	0.004	6.0E-35	0.0004	257.2
HDL-C	rs12317176	12	124404718	t	-0.022	0.002	5.2E-20	0.0002	141.9
HDL-C	rs863750	12	124505444	t	-0.017	0.002	3.1E-13	0.0001	88.0
HDL-C	rs12230272	12	125083696	a	0.022	0.003	5.7E-11	0.0002	102.9
HDL-C	rs838880	12	125261593	t	-0.025	0.002	6.3E-31	0.0003	173.3
HDL-C	rs10773105	12	125283766	t	-0.026	0.002	3.6E-27	0.0003	201.1
HDL-C	rs150728540	12	125292360	a	0.476	0.058	1.6E-16	0.0001	83.8
HDL-C	rs5891	12	125299542	t	0.078	0.009	2.2E-18	0.0001	91.1
HDL-C	rs7306660	12	125327384	a	-0.029	0.002	2.4E-32	0.0004	232.8
HDL-C	rs7298751	12	125380232	a	-0.043	0.004	5.1E-32	0.0004	244.7
HDL-C	rs17532301	13	41609047	a	-0.027	0.005	3.4E-09	0.0001	59.4
HDL-C	rs10483776	14	65914867	a	0.015	0.003	3.9E-09	0.0001	40.4
HDL-C	rs8021180	14	70783943	a	0.014	0.002	3.3E-09	0.0001	61.9
HDL-C	rs13379043	14	74250126	t	-0.018	0.002	1.4E-15	0.0001	78.1
HDL-C	rs4983559	14	105277209	a	-0.025	0.002	2.2E-36	0.0003	190.0
HDL-C	rs9944249	15	41847176	t	-0.013	0.002	9.1E-09	0.0001	53.0
HDL-C	rs55707100	15	43820717	t	-0.093	0.006	3.1E-51	0.0004	277.0
HDL-C	rs4622454	15	58646332	t	0.021	0.003	1.0E-14	0.0002	119.4
HDL-C	rs4775041	15	58674695	c	0.039	0.004	9.1E-24	0.0006	381.0
HDL-C	rs16940147	15	58676119	a	0.050	0.008	1.1E-09	0.0002	146.8
HDL-C	rs117901517	15	58678869	t	0.038	0.006	3.2E-10	0.0002	111.4
HDL-C	rs34718390	15	58682690	a	0.053	0.006	1.1E-18	0.0003	204.5
HDL-C	rs1532085	15	58683366	a	0.062	0.004	2.9E-68	0.0018	1137.3
HDL-C	rs7165077	15	58686809	t	-0.027	0.004	8.5E-13	0.0002	104.1
HDL-C	rs6494003	15	58690048	a	0.093	0.011	5.0E-18	0.0004	247.8
HDL-C	rs16940233	15	58702941	t	-0.048	0.006	7.0E-18	0.0003	198.5
HDL-C	rs12912415	15	58721447	a	0.040	0.004	2.6E-25	0.0004	246.5

HDL-C	rs6494006	15	58730571	t	0.044	0.006	1.7E-11	0.0002	145.5
HDL-C	rs17301746	15	58731395	t	0.088	0.010	8.6E-20	0.0003	169.8
HDL-C	rs936960	15	58751877	t	0.052	0.004	7.9E-32	0.0005	286.4
HDL-C	rs1869138	15	58779039	t	-0.028	0.004	3.1E-11	0.0001	88.4
HDL-C	rs6083	15	58838010	a	-0.016	0.003	5.0E-09	0.0001	77.0
HDL-C	rs17269397	15	58857378	a	-0.026	0.003	6.4E-18	0.0003	208.7
HDL-C	rs424346	15	59010962	t	0.054	0.009	2.2E-09	0.0002	133.3
HDL-C	rs181181625	15	59377940	t	0.348	0.033	1.3E-26	0.0003	208.9
HDL-C	rs12148597	15	61955338	a	-0.016	0.003	5.3E-09	0.0001	54.7
HDL-C	rs34317102	15	63414083	a	-0.019	0.002	1.5E-16	0.0001	80.0
HDL-C	rs2228510	15	63970456	t	-0.012	0.002	4.6E-09	0.0001	42.4
HDL-C	rs139271800	15	90214777	a	-0.248	0.037	3.2E-11	0.0001	53.2
HDL-C	rs7202647	16	985891	t	0.017	0.003	4.6E-09	0.0001	70.1
HDL-C	rs12928822	16	11403893	t	0.018	0.003	1.6E-10	0.0001	53.3
HDL-C	rs1421085	16	53800954	t	0.028	0.002	3.4E-45	0.0004	236.0
HDL-C	rs12929759	16	54410447	a	0.018	0.003	3.0E-13	0.0001	89.4
HDL-C	rs4238772	16	55029160	a	0.029	0.005	1.2E-09	0.0001	84.2
HDL-C	rs8044753	16	56883438	a	0.025	0.003	3.9E-19	0.0003	189.0
HDL-C	rs36049418	16	56921840	a	0.066	0.009	1.4E-14	0.0002	101.5
HDL-C	rs11648751	16	56937262	t	-0.030	0.004	1.0E-11	0.0002	117.6
HDL-C	rs37029	16	56949168	a	-0.024	0.003	2.0E-21	0.0003	177.8
HDL-C	rs9989419	16	56985139	a	-0.034	0.002	1.4E-41	0.0005	334.5
HDL-C	rs72786786	16	56985514	a	0.058	0.004	3.0E-40	0.0014	869.0
HDL-C	rs76315536	16	56986976	t	0.161	0.016	1.1E-24	0.0005	290.3
HDL-C	rs4783961	16	56994894	a	0.026	0.004	2.1E-12	0.0003	208.7
HDL-C	rs1800775	16	56995236	a	0.032	0.005	3.7E-11	0.0005	310.2
HDL-C	rs34065661	16	56995935	c	-0.485	0.019	1.5E-138	0.0021	1273.2
HDL-C	rs7203984	16	56999258	a	0.074	0.005	2.2E-56	0.0018	1104.4
HDL-C	rs1532624	16	57005479	a	0.113	0.005	1.7E-121	0.0062	3859.4
HDL-C	rs12708974	16	57005550	t	-0.086	0.005	4.5E-73	0.0015	956.9
HDL-C	rs5883	16	57007353	t	0.167	0.006	4.7E-186	0.0030	1877.3
HDL-C	rs289714	16	57007451	a	0.082	0.005	8.4E-70	0.0021	1312.3
HDL-C	rs5880	16	57015091	c	-0.138	0.005	1.5E-147	0.0018	1113.2
HDL-C	rs506829	16	57383759	t	0.019	0.003	2.2E-09	0.0001	78.3
HDL-C	rs16962034	16	60419220	t	-0.016	0.003	6.2E-09	0.0001	72.5
HDL-C	rs7202185	16	67714560	a	-0.037	0.005	3.4E-14	0.0002	115.6
HDL-C	rs16942887	16	67928042	a	0.074	0.003	3.1E-134	0.0012	765.1
HDL-C	rs1345868	16	71669624	a	0.014	0.003	7.8E-09	0.0001	55.0
HDL-C	rs12443634	16	81524274	a	-0.031	0.003	2.0E-25	0.0004	244.8
HDL-C	rs3803800	17	7462969	a	-0.013	0.002	5.7E-09	0.0001	40.4
HDL-C	rs2071379	17	26695832	a	0.014	0.002	5.1E-10	0.0001	61.3
HDL-C	rs11078915	17	37715426	t	-0.027	0.004	6.4E-13	0.0003	157.4
HDL-C	rs11869286	17	37813856	c	0.024	0.003	1.8E-18	0.0003	161.7
HDL-C	rs11556624	17	37815304	c	0.087	0.007	8.9E-37	0.0003	213.2
HDL-C	rs4794822	17	38156712	t	-0.018	0.002	1.9E-16	0.0001	91.1
HDL-C	rs72836561	17	41926126	t	-0.187	0.006	7.6E-228	0.0021	1293.7
HDL-C	rs231539	17	41942109	t	-0.036	0.004	4.2E-23	0.0004	221.1
HDL-C	rs17679445	17	46022065	a	0.030	0.004	6.1E-13	0.0001	66.0
HDL-C	rs11652146	17	47422363	a	-0.017	0.003	6.6E-12	0.0001	78.1
HDL-C	rs12602912	17	65870073	t	-0.018	0.002	2.2E-13	0.0001	59.4
HDL-C	rs10852765	17	66884879	a	0.016	0.002	1.1E-11	0.0001	73.8
HDL-C	rs2292642	17	76395430	t	0.032	0.002	1.6E-55	0.0005	297.9
HDL-C	rs2289750	17	76437343	a	-0.028	0.005	6.5E-09	0.0001	77.2

HDL-C	rs1788783	18	21161134	t	0.015	0.002	7.0E-11	0.0001	69.4
HDL-C	rs8093249	18	47097398	a	0.034	0.004	9.5E-22	0.0003	184.7
HDL-C	rs77960347	18	47109955	a	-0.250	0.009	7.7E-166	0.0017	1033.2
HDL-C	rs117623631	18	47113165	t	0.343	0.025	1.0E-41	0.0005	333.8
HDL-C	rs3786248	18	47118219	t	-0.059	0.006	2.8E-26	0.0004	221.8
HDL-C	rs7241918	18	47160953	t	0.074	0.003	4.3E-120	0.0015	902.9
HDL-C	rs4939886	18	47176793	a	0.020	0.003	8.8E-10	0.0002	110.5
HDL-C	rs11660468	18	47209143	t	0.025	0.002	1.2E-25	0.0003	190.2
HDL-C	rs9956279	18	57942799	t	-0.017	0.003	1.0E-10	0.0001	71.5
HDL-C	rs12975319	19	3414088	a	-0.015	0.003	3.7E-09	0.0001	62.1
HDL-C	rs10408844	19	7244884	t	0.018	0.003	5.2E-10	0.0001	63.6
HDL-C	rs4804833	19	7970635	a	-0.015	0.002	4.9E-10	0.0001	66.5
HDL-C	rs116843064	19	8429323	a	0.246	0.007	1.3E-252	0.0031	1913.2
HDL-C	rs2913968	19	8467235	t	0.017	0.003	2.0E-10	0.0001	68.3
HDL-C	rs6511720	19	11202306	t	0.020	0.003	1.1E-10	0.0001	49.4
HDL-C	rs17616661	19	11303554	a	0.026	0.004	1.2E-12	0.0001	62.1
HDL-C	rs737337	19	11347493	t	0.057	0.003	1.2E-62	0.0006	375.5
HDL-C	rs2111504	19	32917455	a	0.017	0.003	1.4E-10	0.0001	48.1
HDL-C	rs731839	19	33899065	a	0.018	0.002	2.4E-17	0.0001	89.5
HDL-C	rs2075650	19	45395619	a	0.038	0.003	7.7E-28	0.0003	209.7
HDL-C	rs77301115	19	45396973	a	-0.066	0.009	2.0E-13	0.0002	134.3
HDL-C	rs7412	19	45412079	t	0.086	0.004	3.0E-85	0.0011	650.4
HDL-C	rs439401	19	45414451	t	0.014	0.002	7.9E-11	0.0001	58.3
HDL-C	rs4420638	19	45422946	a	0.042	0.004	2.9E-29	0.0005	318.0
HDL-C	rs5167	19	45448465	t	-0.038	0.002	2.4E-78	0.0007	405.2
HDL-C	rs8111071	19	46307406	a	0.028	0.004	1.1E-14	0.0001	72.3
HDL-C	rs2303108	19	47589895	t	0.014	0.002	7.9E-11	0.0001	49.7
HDL-C	rs3752125	19	52327784	t	-0.020	0.003	3.4E-16	0.0002	105.8
HDL-C	rs12975366	19	54759361	t	0.021	0.002	1.4E-19	0.0002	132.8
HDL-C	rs386000	19	54792761	c	0.044	0.003	5.7E-48	0.0006	395.1
HDL-C	rs12979085	19	54837165	a	0.020	0.003	1.1E-12	0.0002	105.2
HDL-C	rs1132274	20	17596155	a	-0.016	0.003	3.9E-09	0.0001	42.6
HDL-C	rs2268086	20	32648738	a	0.014	0.002	3.4E-09	0.0001	60.2
HDL-C	rs1415771	20	33734493	a	-0.013	0.002	1.9E-10	0.0001	51.3
HDL-C	rs1800961	20	43042364	t	-0.142	0.006	5.1E-137	0.0012	745.5
HDL-C	rs3827066	20	44586023	t	0.050	0.004	4.2E-37	0.0007	413.4
HDL-C	rs8123864	20	44598670	t	0.048	0.003	2.2E-55	0.0010	643.8
HDL-C	rs1211644	20	45592842	t	-0.018	0.003	3.2E-09	0.0001	73.7
HDL-C	rs11700063	20	46153148	a	0.021	0.003	3.3E-14	0.0002	101.2
HDL-C	rs4239651	20	46340596	t	-0.021	0.003	8.4E-10	0.0001	82.2
HDL-C	rs6025606	20	56098733	t	0.012	0.002	2.9E-09	0.0001	40.6
HDL-C	rs310631	20	62196253	a	0.013	0.002	7.4E-09	0.0001	52.9
HDL-C	rs6062343	20	62695931	a	0.014	0.002	7.6E-12	0.0001	57.7
HDL-C	rs235314	21	46271452	t	-0.015	0.002	7.2E-11	0.0001	69.0
HDL-C	rs12482088	21	46901973	a	0.019	0.003	5.0E-10	0.0001	77.3
HDL-C	rs181362	22	21932068	t	-0.030	0.002	1.3E-36	0.0003	202.2
HDL-C	rs4823006	22	29451671	a	-0.013	0.002	9.1E-11	0.0001	51.4
HDL-C	rs17738540	22	30888527	t	-0.018	0.002	1.6E-14	0.0001	71.1
HDL-C	rs738322	22	38569006	a	-0.020	0.002	4.2E-23	0.0002	121.0
HDL-C	rs738409	22	44324727	c	0.016	0.002	1.5E-11	0.0001	51.9
LDL-C	***rs2992753***	1	18808292	a	-0.012	0.002	3.9E-09	0.0001	44.0
LDL-C	rs35172831	1	25850206	t	0.019	0.003	8.1E-12	0.0002	111.8
LDL-C	rs12748152	1	27138393	t	0.026	0.004	7.6E-12	0.0001	57.3

LDL-C	rs17111483	1	55485098	t	0.040	0.005	1.9E-16	0.0003	190.5
LDL-C	rs11206510	1	55496039	t	0.068	0.003	2.7E-111	0.0013	832.9
LDL-C	rs2479409	1	55504650	a	-0.022	0.002	1.1E-22	0.0002	140.7
LDL-C	rs11583680	1	55505668	t	0.027	0.004	1.9E-12	0.0002	105.8
LDL-C	rs10888896	1	55509213	c	0.029	0.003	1.0E-20	0.0003	200.2
LDL-C	rs693668	1	55521109	a	0.029	0.004	4.5E-15	0.0004	232.2
LDL-C	rs562556	1	55524237	a	0.130	0.008	4.9E-61	0.0047	2926.2
LDL-C	rs61739739	1	55548991	t	0.080	0.011	1.7E-12	0.0001	81.2
LDL-C	rs1165222	1	55638075	a	-0.135	0.008	1.7E-63	0.0047	2908.7
LDL-C	rs1475701	1	55638546	t	-0.068	0.006	1.8E-26	0.0003	211.8
LDL-C	rs7551981	1	55719166	t	0.030	0.003	7.2E-27	0.0004	258.6
LDL-C	rs10489488	1	55792722	a	-0.093	0.011	5.3E-17	0.0002	152.8
LDL-C	rs12742537	1	63346976	a	0.015	0.002	2.5E-14	0.0001	70.2
LDL-C	rs10874746	1	93323971	t	-0.015	0.002	2.3E-13	0.0001	66.4
LDL-C	rs1730859	1	107617707	a	-0.019	0.003	2.6E-13	0.0002	98.5
LDL-C	rs12740374	1	109817590	t	-0.160	0.002	0.0E+00	0.0086	5379.2
LDL-C	rs4745	1	155106227	a	0.012	0.002	5.7E-10	0.0001	47.5
LDL-C	rs867772	1	220972343	a	-0.026	0.003	5.8E-19	0.0003	173.2
LDL-C	rs558971	1	234853406	a	-0.036	0.002	1.2E-51	0.0007	406.6
LDL-C	rs1473886	2	20368519	t	-0.015	0.002	2.1E-10	0.0001	65.9
LDL-C	rs12710745	2	21112689	a	0.020	0.003	1.0E-14	0.0002	119.0
LDL-C	rs6547409	2	21190209	t	-0.095	0.006	8.9E-62	0.0009	573.7
LDL-C	rs1801702	2	21225485	c	0.097	0.007	1.5E-47	0.0005	281.4
LDL-C	rs1042023	2	21229446	c	0.086	0.011	5.5E-15	0.0001	85.9
LDL-C	rs12713843	2	21238367	t	-0.188	0.016	8.2E-33	0.0003	191.3
LDL-C	rs12713844	2	21238413	c	0.074	0.011	5.0E-12	0.0001	63.7
LDL-C	rs679899	2	21250914	a	-0.029	0.002	7.0E-37	0.0004	267.5
LDL-C	rs515135	2	21286057	t	-0.088	0.003	1.4E-202	0.0024	1489.3
LDL-C	rs62122515	2	21295227	a	0.026	0.003	8.2E-14	0.0003	183.0
LDL-C	rs4635554	2	21389659	t	-0.022	0.003	2.9E-18	0.0002	133.9
LDL-C	rs1260327	2	27711893	a	0.015	0.002	2.1E-11	0.0001	67.5
LDL-C	rs814295	2	27743215	a	0.031	0.003	1.2E-19	0.0002	153.4
LDL-C	rs11556157	2	44028013	a	-0.020	0.002	2.0E-18	0.0002	94.7
LDL-C	rs72796748	2	44080310	t	0.059	0.007	2.6E-19	0.0003	189.1
LDL-C	rs4077440	2	44081042	t	0.117	0.005	1.1E-122	0.0067	4167.0
LDL-C	rs6718187	2	44082362	a	-0.070	0.005	2.0E-43	0.0024	1501.7
LDL-C	rs4148218	2	44099582	a	-0.060	0.003	7.7E-70	0.0011	676.7
LDL-C	rs11125936	2	62871225	t	0.025	0.003	1.1E-13	0.0001	66.5
LDL-C	rs10185855	2	101642260	a	0.014	0.002	8.9E-09	0.0001	55.2
LDL-C	rs10490626	2	118835841	a	-0.045	0.004	2.4E-30	0.0003	168.7
LDL-C	rs1808458	2	118879253	t	0.031	0.005	2.6E-10	0.0001	74.7
LDL-C	rs6706968	2	121310269	a	-0.023	0.003	3.9E-16	0.0003	157.6
LDL-C	rs2198562	2	158465673	c	0.035	0.006	2.9E-10	0.0001	68.8
LDL-C	rs2287623	2	169830155	a	-0.018	0.002	1.4E-19	0.0002	97.5
LDL-C	rs6435161	2	203519783	t	0.024	0.003	4.3E-21	0.0002	146.1
LDL-C	rs1048013	2	204154552	t	0.012	0.002	8.8E-10	0.0001	46.2
LDL-C	rs887829	2	234668570	t	-0.021	0.002	1.7E-22	0.0002	115.3
LDL-C	rs7616006	3	12267648	a	0.022	0.002	2.3E-20	0.0002	149.7
LDL-C	rs7640978	3	32533010	t	-0.032	0.004	4.7E-20	0.0002	104.4
LDL-C	rs2251219	3	52584787	t	-0.014	0.002	7.6E-11	0.0001	54.9
LDL-C	rs13315871	3	58381287	a	-0.032	0.004	3.2E-19	0.0002	101.4
LDL-C	rs1979848	3	132165178	a	0.026	0.004	2.3E-09	0.0001	69.6
LDL-C	rs10513551	3	160086055	t	-0.015	0.002	1.4E-10	0.0001	73.0

LDL-C	rs3748034	4	3446091	t	0.018	0.003	2.4E-09	0.0001	49.1
LDL-C	rs3816873	4	100504664	t	0.014	0.002	4.1E-09	0.0001	43.3
LDL-C	rs13107325	4	103188709	t	-0.029	0.004	9.9E-13	0.0001	76.5
LDL-C	rs870992	5	52193237	a	-0.027	0.004	1.8E-10	0.0001	71.5
LDL-C	rs10062361	5	74565153	t	0.025	0.003	1.9E-13	0.0002	132.1
LDL-C	rs3846662	5	74651084	a	-0.057	0.002	2.1E-131	0.0016	980.6
LDL-C	rs11955819	5	74782412	a	-0.058	0.008	4.8E-13	0.0002	108.9
LDL-C	rs4530754	5	122855416	a	0.016	0.002	1.8E-14	0.0001	79.1
LDL-C	rs10065787	5	131436486	t	-0.019	0.003	2.2E-09	0.0002	109.2
LDL-C	rs2522056	5	131801726	a	-0.018	0.002	1.2E-13	0.0001	70.1
LDL-C	rs4704825	5	156382308	a	-0.028	0.003	5.1E-25	0.0004	221.9
LDL-C	rs2235215	6	16131156	t	0.025	0.003	1.8E-18	0.0003	163.8
LDL-C	rs1800562	6	26093141	a	-0.049	0.004	6.6E-29	0.0003	159.9
LDL-C	rs129128	6	26125342	t	0.021	0.004	3.4E-09	0.0001	62.5
LDL-C	rs2249741	6	31240712	a	-0.020	0.003	7.8E-14	0.0002	126.2
LDL-C	rs13192471	6	32671103	t	-0.034	0.003	5.8E-33	0.0003	179.2
LDL-C	rs3800406	6	35133074	a	0.028	0.004	1.1E-12	0.0002	95.6
LDL-C	rs1129187	6	42932200	t	-0.012	0.002	8.5E-10	0.0001	45.9
LDL-C	rs2239619	6	52453220	a	0.016	0.002	4.0E-14	0.0001	73.3
LDL-C	rs17789218	6	100600097	t	0.022	0.003	4.0E-16	0.0002	109.7
LDL-C	rs9390698	6	101296389	a	0.013	0.002	1.3E-10	0.0001	50.0
LDL-C	rs3798236	6	116309649	t	0.018	0.003	1.8E-13	0.0002	93.5
LDL-C	rs9376090	6	135411228	t	0.028	0.002	5.6E-33	0.0003	172.8
LDL-C	rs1044418	6	139229872	t	0.018	0.003	1.2E-10	0.0001	52.6
LDL-C	rs12208357	6	160543148	t	0.062	0.004	2.7E-52	0.0005	319.8
LDL-C	rs34130495	6	160560824	a	0.048	0.007	2.5E-13	0.0001	66.9
LDL-C	rs62440901	6	160569068	t	0.036	0.004	1.1E-20	0.0003	199.5
LDL-C	rs3798220	6	160961137	t	-0.136	0.008	1.2E-64	0.0007	410.3
LDL-C	rs10455872	6	161010118	a	-0.088	0.006	4.6E-54	0.0010	610.7
LDL-C	rs12175867	6	161019138	t	0.025	0.003	1.8E-14	0.0002	145.5
LDL-C	rs1652507	6	161082461	t	0.027	0.003	1.2E-19	0.0002	125.7
LDL-C	rs10263252	7	1049949	a	-0.023	0.003	6.3E-12	0.0002	107.4
LDL-C	rs1997243	7	1083777	a	-0.016	0.003	6.7E-09	0.0001	43.9
LDL-C	rs144787122	7	2296552	a	-0.104	0.018	4.0E-09	0.0001	44.1
LDL-C	rs2282889	7	21476188	a	-0.016	0.003	5.0E-09	0.0001	80.4
LDL-C	rs12670798	7	21607352	t	-0.029	0.002	1.4E-34	0.0003	196.1
LDL-C	rs4722551	7	25991826	t	-0.039	0.003	3.2E-42	0.0004	256.4
LDL-C	rs2391211	7	26008233	t	0.023	0.004	7.7E-11	0.0002	106.7
LDL-C	rs4302748	7	36191699	a	0.015	0.003	1.2E-09	0.0001	44.7
LDL-C	rs35803101	7	44578500	a	-0.139	0.017	1.1E-15	0.0001	82.8
LDL-C	rs10260606	7	44584551	c	0.037	0.003	1.2E-32	0.0004	260.1
LDL-C	rs1014283	7	87076587	a	-0.019	0.003	2.0E-09	0.0001	63.9
LDL-C	rs330093	8	9175958	c	0.029	0.003	2.0E-20	0.0003	187.1
LDL-C	rs11774381	8	9183339	t	-0.029	0.003	1.9E-24	0.0003	203.9
LDL-C	rs11782386	8	9201787	t	-0.025	0.003	8.5E-13	0.0001	72.3
LDL-C	rs4921914	8	18272438	t	-0.018	0.002	4.9E-14	0.0001	73.3
LDL-C	rs9298506	8	55437524	a	-0.022	0.003	8.4E-16	0.0002	92.9
LDL-C	rs2081687	8	59388565	t	0.027	0.002	2.5E-37	0.0003	202.4
LDL-C	rs2737245	8	116658583	t	-0.018	0.003	2.7E-09	0.0001	76.6
LDL-C	rs2954029	8	126490972	a	0.024	0.003	4.1E-18	0.0003	178.7
LDL-C	rs4870941	8	126498828	c	0.044	0.004	3.3E-33	0.0007	422.8
LDL-C	rs2954038	8	126507389	a	-0.037	0.003	8.5E-32	0.0006	344.9
LDL-C	rs3780181	9	2640759	a	0.033	0.004	4.1E-17	0.0001	89.4

LDL-C	rs67710536	9	19376255	a	-0.027	0.003	3.7E-15	0.0001	80.5
LDL-C	rs10757272	9	22088260	t	-0.020	0.003	2.9E-10	0.0002	117.8
LDL-C	rs3905000	9	107657070	a	-0.018	0.003	6.7E-10	0.0001	51.0
LDL-C	rs635634	9	136155000	t	0.075	0.003	1.5E-182	0.0018	1094.2
LDL-C	rs3812594	9	139368953	a	-0.014	0.002	1.6E-09	0.0001	44.9
LDL-C	rs7080366	10	17254832	t	0.019	0.003	8.5E-15	0.0002	115.9
LDL-C	rs41274050	10	52573772	t	0.077	0.011	4.8E-12	0.0002	142.2
LDL-C	rs2068888	10	94839642	a	-0.017	0.002	1.1E-17	0.0001	89.7
LDL-C	rs2274224	10	96039597	c	-0.014	0.002	3.0E-09	0.0001	61.7
LDL-C	rs2792751	10	113940329	t	0.026	0.002	1.1E-32	0.0003	176.5
LDL-C	rs1891110	10	124610027	a	0.021	0.002	3.0E-26	0.0002	137.3
LDL-C	rs4752805	11	48018355	a	-0.015	0.002	7.0E-10	0.0001	50.7
LDL-C	rs174449	11	61640379	a	0.027	0.003	1.1E-26	0.0003	204.8
LDL-C	rs2521567	11	61699055	a	-0.015	0.002	5.9E-10	0.0001	66.6
LDL-C	rs3816492	11	66297363	t	-0.017	0.002	3.4E-12	0.0001	61.4
LDL-C	rs11603023	11	118486067	t	0.013	0.002	3.0E-10	0.0001	47.9
LDL-C	rs7941030	11	122522375	t	-0.014	0.002	5.7E-12	0.0001	55.0
LDL-C	rs10893500	11	126250774	t	-0.043	0.003	4.0E-36	0.0004	271.7
LDL-C	rs1521516	12	51055708	t	-0.016	0.003	1.2E-10	0.0001	73.2
LDL-C	rs61754230	12	72179446	t	0.052	0.008	2.3E-11	0.0001	55.4
LDL-C	rs3184504	12	111884608	t	-0.026	0.002	1.4E-34	0.0003	204.5
LDL-C	rs1169288	12	121416650	a	-0.035	0.002	1.1E-55	0.0005	326.9
LDL-C	rs10773003	12	123775127	a	0.024	0.004	3.1E-09	0.0001	56.7
LDL-C	rs11571836	13	32973439	a	0.021	0.003	4.1E-10	0.0002	94.1
LDL-C	rs3742318	13	33017043	t	0.020	0.003	9.2E-16	0.0001	78.6
LDL-C	rs4773173	13	111025118	a	0.016	0.003	5.4E-11	0.0001	75.4
LDL-C	rs9646133	14	71096344	t	-0.019	0.002	2.0E-20	0.0002	101.4
LDL-C	rs13379043	14	74250126	t	0.014	0.002	5.5E-11	0.0001	52.7
LDL-C	rs28929474	14	94844947	t	0.071	0.008	5.0E-19	0.0002	102.5
LDL-C	rs3812945	15	75289722	t	-0.015	0.002	4.1E-10	0.0001	68.7
LDL-C	rs35259348	16	72003952	c	0.020	0.003	7.7E-13	0.0001	90.1
LDL-C	rs7197453	16	72079127	c	0.025	0.004	1.5E-12	0.0003	177.3
LDL-C	rs217181	16	72114002	t	-0.049	0.003	1.3E-48	0.0008	492.6
LDL-C	rs9302635	16	72144174	t	0.055	0.004	1.9E-41	0.0009	559.9
LDL-C	rs28555129	16	83984776	a	0.013	0.002	1.1E-09	0.0001	48.7
LDL-C	rs8069974	17	4670972	c	0.015	0.003	3.4E-09	0.0001	62.2
LDL-C	rs314253	17	7091650	t	0.020	0.002	4.6E-22	0.0002	115.1
LDL-C	rs871841	17	8216468	t	-0.015	0.002	2.5E-13	0.0001	66.1
LDL-C	rs6502640	17	18122485	a	0.019	0.003	3.6E-09	0.0001	75.4
LDL-C	rs704	17	26694861	a	0.020	0.002	2.2E-23	0.0002	124.4
LDL-C	rs12601110	17	27035335	a	0.027	0.005	4.9E-09	0.0001	71.0
LDL-C	rs1487971	17	28572753	t	-0.016	0.002	8.3E-11	0.0001	71.9
LDL-C	rs11080150	17	29629326	a	0.015	0.002	2.3E-11	0.0001	57.7
LDL-C	rs72836561	17	41926126	t	-0.037	0.006	2.5E-10	0.0001	51.2
LDL-C	rs4968318	17	45451894	a	0.022	0.002	1.7E-27	0.0002	142.7
LDL-C	rs118004742	17	45468858	t	0.029	0.005	2.2E-09	0.0001	52.4
LDL-C	rs12939848	17	65370808	t	-0.014	0.002	5.6E-09	0.0001	56.8
LDL-C	rs12602912	17	65870073	t	0.016	0.002	7.2E-11	0.0001	46.9
LDL-C	rs77542162	17	67081278	a	-0.177	0.009	1.9E-84	0.0011	667.1
LDL-C	rs4968839	17	67125840	t	0.039	0.003	5.8E-47	0.0006	395.5
LDL-C	rs72852601	17	67149972	t	0.048	0.008	2.5E-09	0.0001	48.2
LDL-C	rs2886232	17	67150176	t	0.041	0.005	6.6E-17	0.0003	202.3
LDL-C	rs4485425	17	73767437	a	-0.019	0.002	2.2E-16	0.0002	94.0

LDL-C	rs4129767	17	76403984	a	0.016	0.002	5.1E-15	0.0001	75.7
LDL-C	rs77960347	18	47109955	a	-0.080	0.009	1.1E-17	0.0002	104.4
LDL-C	rs7241918	18	47160953	t	0.019	0.003	9.0E-12	0.0001	60.0
LDL-C	rs941408	19	2814181	t	0.016	0.003	3.7E-10	0.0001	67.5
LDL-C	rs1982074	19	10668673	a	0.023	0.003	3.2E-18	0.0002	97.1
LDL-C	rs892010	19	11038843	c	0.040	0.005	2.3E-13	0.0002	120.0
LDL-C	rs10417443	19	11129429	c	0.032	0.003	1.5E-31	0.0005	322.9
LDL-C	rs1122608	19	11163601	t	-0.048	0.003	9.6E-63	0.0008	511.3
LDL-C	rs4300767	19	11163689	a	-0.095	0.006	3.8E-63	0.0017	1063.1
LDL-C	rs6511721	19	11206575	a	-0.037	0.003	1.1E-31	0.0007	425.7
LDL-C	rs73015030	19	11207516	a	-0.079	0.009	4.8E-20	0.0004	223.7
LDL-C	rs3745677	19	11211077	a	0.077	0.008	4.0E-20	0.0007	432.9
LDL-C	rs11669576	19	11222300	a	0.064	0.007	3.6E-22	0.0004	238.5
LDL-C	rs45508991	19	11233886	t	0.106	0.015	3.5E-13	0.0001	82.0
LDL-C	rs5927	19	11233941	a	-0.030	0.004	7.9E-15	0.0003	208.9
LDL-C	rs2569538	19	11238548	a	-0.061	0.007	2.1E-20	0.0006	389.1
LDL-C	rs892115	19	11263650	t	-0.023	0.004	2.3E-10	0.0002	143.1
LDL-C	rs6511727	19	11315817	t	0.020	0.003	1.8E-15	0.0002	119.4
LDL-C	rs4804579	19	11358700	t	0.024	0.004	2.8E-10	0.0002	99.9
LDL-C	rs58542926	19	19379549	t	-0.098	0.004	7.5E-146	0.0013	816.7
LDL-C	rs150090162	19	44536189	a	0.161	0.019	1.0E-16	0.0002	115.4
LDL-C	rs8103315	19	45254168	a	0.028	0.004	2.0E-11	0.0002	102.2
LDL-C	rs35106910	19	45284266	a	0.032	0.005	1.3E-11	0.0001	58.6
LDL-C	rs1135062	19	45322744	a	-0.017	0.002	4.5E-13	0.0001	73.4
LDL-C	rs3852856	19	45361574	a	0.061	0.005	5.9E-38	0.0012	747.4
LDL-C	rs12610605	19	45370838	a	0.126	0.005	4.9E-164	0.0043	2678.6
LDL-C	rs8104483	19	45372354	t	-0.087	0.004	3.4E-116	0.0031	1927.4
LDL-C	rs6859	19	45382034	a	0.078	0.003	8.7E-132	0.0030	1842.4
LDL-C	rs11669338	19	45382984	t	0.050	0.006	8.0E-16	0.0004	255.7
LDL-C	rs3852861	19	45383061	t	-0.056	0.004	1.1E-45	0.0015	950.4
LDL-C	rs187706273	19	45385488	a	-0.108	0.016	4.4E-11	0.0001	76.1
LDL-C	rs157580	19	45395266	a	0.075	0.003	2.2E-113	0.0027	1659.5
LDL-C	rs157582	19	45396219	t	-0.032	0.005	7.3E-11	0.0004	226.2
LDL-C	rs115881343	19	45403216	t	0.195	0.009	6.8E-94	0.0018	1136.5
LDL-C	rs10119	19	45406673	a	0.067	0.004	1.9E-53	0.0018	1103.7
LDL-C	rs405509	19	45408836	t	0.173	0.004	0.0E+00	0.0149	9325.2
LDL-C	rs769450	19	45410444	a	0.060	0.005	2.9E-37	0.0018	1093.3
LDL-C	rs769452	19	45411110	t	-0.149	0.020	4.3E-14	0.0001	71.4
LDL-C	rs439401	19	45414451	t	0.029	0.003	4.6E-22	0.0004	249.3
LDL-C	rs59325138	19	45416291	t	0.098	0.004	1.0E-119	0.0046	2845.8
LDL-C	rs732841	19	46207810	a	0.041	0.006	6.0E-13	0.0002	103.2
LDL-C	rs17651629	19	46406463	t	-0.032	0.004	1.3E-17	0.0002	127.7
LDL-C	rs492602	19	49206417	a	-0.028	0.002	4.3E-40	0.0004	238.7
LDL-C	rs641738	19	54676763	t	0.014	0.002	1.0E-09	0.0001	59.7
LDL-C	rs35350976	19	59023174	a	-0.017	0.003	7.2E-09	0.0001	51.8
LDL-C	rs2143544	20	17789221	t	-0.016	0.003	5.5E-09	0.0001	80.9
LDL-C	rs2745865	20	17847735	t	0.039	0.004	2.1E-26	0.0004	239.8
LDL-C	rs6058302	20	34290037	t	-0.027	0.003	1.8E-15	0.0002	106.0
LDL-C	rs6016373	20	39154095	a	0.023	0.002	9.2E-30	0.0002	150.9
LDL-C	rs926663	20	39245775	a	0.014	0.003	8.3E-09	0.0001	62.1
LDL-C	rs6072328	20	39913996	t	-0.026	0.003	1.7E-22	0.0003	203.1
LDL-C	rs6062343	20	62695931	a	-0.015	0.002	2.9E-13	0.0001	65.6
LDL-C	rs2833487	21	33087863	a	-0.035	0.006	4.3E-10	0.0001	71.1

LDL-C	rs2183573	21	40574305	a	-0.014	0.002	4.0E-10	0.0001	61.7
LDL-C	rs138777	22	35711098	a	0.013	0.002	2.3E-09	0.0001	45.0
LDL-C	rs738409	22	44324727	c	0.015	0.002	6.8E-10	0.0001	47.2
LDL-C	rs13268	22	45996298	a	0.042	0.007	3.6E-10	0.0001	48.6
TG	rs1077514	1	23766233	t	0.021	0.003	2.4E-14	0.0001	71.0
TG	***rs16826069***	1	39797055	a	-0.024	0.002	5.4E-23	0.0002	116.7
TG	rs2055491	1	50852769	t	-0.012	0.002	3.6E-09	0.0001	43.0
TG	rs10889353	1	63118196	a	0.075	0.002	2.0E-280	0.0025	1552.9
TG	rs2613503	1	72839774	a	0.020	0.003	1.5E-11	0.0001	74.0
TG	rs12740374	1	109817590	t	-0.015	0.002	1.8E-10	0.0001	48.9
TG	rs12043350	1	153854380	t	0.015	0.003	9.4E-10	0.0001	61.4
TG	rs1011731	1	172346548	a	-0.013	0.002	4.1E-11	0.0001	52.6
TG	rs78444298	1	184672098	a	-0.052	0.009	3.0E-09	0.0001	51.3
TG	rs2821231	1	203518382	t	0.016	0.003	3.9E-09	0.0001	77.8
TG	rs765751	1	219669226	t	-0.020	0.002	2.3E-17	0.0002	109.9
TG	rs10489615	1	230304988	a	0.039	0.002	3.2E-85	0.0007	461.5
TG	rs2273967	1	230415293	t	-0.018	0.003	8.8E-11	0.0001	69.0
TG	rs1473886	2	20368519	t	-0.017	0.002	1.2E-13	0.0001	89.8
TG	rs1801701	2	21228827	t	-0.030	0.004	2.2E-17	0.0001	89.0
TG	rs676210	2	21231524	a	-0.076	0.002	3.7E-211	0.0020	1208.9
TG	rs541041	2	21294975	a	0.023	0.003	1.2E-18	0.0002	102.0
TG	rs3208747	2	24431127	t	-0.150	0.022	6.3E-12	0.0001	66.5
TG	rs1049817	2	27550967	a	0.046	0.003	5.2E-49	0.0010	623.5
TG	rs11689803	2	27566520	a	-0.021	0.004	1.0E-09	0.0002	111.0
TG	rs11891554	2	27613617	a	-0.096	0.006	7.2E-63	0.0008	472.4
TG	rs79593977	2	27702663	a	0.269	0.029	2.0E-20	0.0013	806.8
TG	rs780090	2	27718474	t	0.048	0.005	1.9E-23	0.0004	237.5
TG	rs147073127	2	27726437	a	-0.213	0.019	2.7E-28	0.0003	162.7
TG	rs814295	2	27743215	a	0.077	0.004	9.3E-90	0.0016	982.0
TG	rs1919128	2	27801759	a	-0.046	0.003	1.4E-47	0.0008	499.0
TG	rs115289288	2	28006500	t	-0.222	0.019	1.4E-31	0.0022	1336.3
TG	rs4245791	2	44074431	t	-0.017	0.002	1.1E-14	0.0001	75.1
TG	rs1861410	2	58933591	t	-0.016	0.003	2.0E-09	0.0001	74.3
TG	rs2723062	2	65280220	a	-0.023	0.003	1.6E-17	0.0002	151.0
TG	rs2049019	2	66671858	a	-0.014	0.002	9.5E-09	0.0001	50.4
TG	rs13396091	2	146371961	a	0.014	0.002	2.0E-09	0.0001	57.8
TG	rs13389219	2	165528876	t	-0.035	0.002	2.1E-62	0.0006	364.9
TG	rs16849863	2	165728290	t	0.056	0.008	1.6E-12	0.0001	71.7
TG	rs3769823	2	202122995	a	-0.014	0.002	3.2E-10	0.0001	50.0
TG	rs6435161	2	203519783	t	0.015	0.002	1.4E-09	0.0001	55.5
TG	rs1344642	2	219555262	a	-0.013	0.002	5.1E-11	0.0001	52.5
TG	rs2943650	2	227105921	t	0.042	0.003	2.9E-48	0.0008	523.1
TG	rs1801282	3	12393125	c	0.034	0.003	3.7E-26	0.0002	149.4
TG	rs17819328	3	12489342	t	-0.025	0.002	3.3E-26	0.0003	191.2
TG	rs13326165	3	52532118	a	-0.017	0.003	1.4E-11	0.0001	56.1
TG	rs7621025	3	136272246	t	-0.021	0.003	4.1E-10	0.0002	96.8
TG	rs4683438	3	142652559	t	-0.017	0.002	8.1E-13	0.0001	82.8
TG	rs382534	3	155547274	t	0.015	0.003	4.5E-09	0.0001	54.4
TG	rs9822326	3	156803565	a	0.016	0.002	3.8E-11	0.0001	73.7
TG	rs10513687	3	170725730	t	0.022	0.003	6.7E-11	0.0001	67.4
TG	rs17600346	3	172223982	t	-0.046	0.007	3.3E-11	0.0002	101.7
TG	rs6599389	4	939113	a	0.022	0.004	6.9E-09	0.0001	45.5
TG	rs11248060	4	964359	t	0.022	0.003	6.1E-13	0.0001	64.6

TG	rs3748034	4	3446091	t	0.028	0.003	2.9E-19	0.0002	119.8
TG	rs16844401	4	3449652	a	0.032	0.004	1.0E-14	0.0001	80.5
TG	rs6831256	4	3473139	a	-0.014	0.002	1.7E-11	0.0001	60.4
TG	rs9884830	4	26027797	t	0.019	0.003	2.4E-10	0.0001	62.0
TG	rs1037814	4	88049850	t	-0.024	0.002	2.8E-24	0.0003	177.9
TG	rs10029254	4	88160140	t	0.021	0.003	1.1E-13	0.0002	93.7
TG	rs13133548	4	89740128	a	0.012	0.002	3.3E-09	0.0001	43.2
TG	rs1126673	4	100045616	t	0.018	0.002	5.6E-16	0.0001	81.2
TG	rs13107325	4	103188709	t	0.033	0.004	1.7E-15	0.0002	95.3
TG	rs41278045	4	110638764	a	-0.199	0.029	4.0E-12	0.0001	58.7
TG	rs6054	4	155489608	t	0.123	0.018	7.2E-12	0.0001	67.4
TG	rs6855363	4	157670537	t	0.017	0.002	5.9E-12	0.0001	74.3
TG	rs4311394	5	53300662	a	-0.020	0.002	3.4E-20	0.0002	98.2
TG	rs459193	5	55806751	a	-0.035	0.002	3.7E-52	0.0005	300.7
TG	rs2448428	5	55844049	t	0.015	0.002	4.3E-10	0.0001	68.3
TG	rs9686661	5	55861786	t	0.044	0.003	2.3E-67	0.0006	374.1
TG	rs4976033	5	67714246	a	-0.016	0.002	1.2E-15	0.0001	78.1
TG	rs1045241	5	118729286	t	-0.017	0.003	3.7E-11	0.0001	71.3
TG	rs26008	5	131008194	t	0.024	0.004	2.3E-10	0.0001	49.1
TG	rs4705986	5	132349654	t	0.034	0.006	4.4E-09	0.0001	84.1
TG	rs4704820	5	156334681	t	0.022	0.003	1.0E-11	0.0001	88.6
TG	rs6882076	5	156390297	t	-0.042	0.002	6.7E-83	0.0008	501.2
TG	rs1650527	5	158022724	t	0.025	0.003	5.1E-16	0.0002	138.9
TG	rs2524060	6	31267422	a	-0.029	0.003	3.3E-20	0.0003	185.6
TG	rs2442719	6	31320538	t	-0.024	0.002	7.5E-32	0.0003	178.9
TG	rs17207867	6	31938412	t	0.027	0.004	5.0E-13	0.0001	70.2
TG	rs9271366	6	32586854	a	0.028	0.003	7.4E-19	0.0002	119.2
TG	rs9273368	6	32626475	a	-0.018	0.003	9.3E-09	0.0001	78.8
TG	rs11752643	6	32669373	t	0.066	0.006	3.7E-26	0.0003	155.8
TG	rs2395655	6	36645696	a	0.017	0.002	6.6E-13	0.0001	80.0
TG	rs6458349	6	43759789	a	0.038	0.003	4.1E-37	0.0006	353.7
TG	rs78807370	6	43761091	a	-0.043	0.004	3.9E-31	0.0005	293.1
TG	rs881858	6	43806609	a	0.020	0.002	1.8E-20	0.0002	107.2
TG	rs4715316	6	52628998	t	-0.016	0.003	8.5E-09	0.0001	68.8
TG	rs2745353	6	127452935	t	0.019	0.002	1.9E-20	0.0002	106.0
TG	rs9388768	6	130374102	a	0.013	0.002	1.2E-09	0.0001	45.4
TG	rs643381	6	139839423	a	-0.024	0.002	3.2E-32	0.0003	172.5
TG	rs12208357	6	160543148	t	0.030	0.004	1.1E-13	0.0001	75.1
TG	rs2665357	6	160848167	a	-0.018	0.002	1.9E-15	0.0002	104.3
TG	rs645718	6	161406239	a	-0.034	0.005	2.1E-10	0.0001	62.5
TG	rs12699758	7	15964238	a	0.016	0.003	3.6E-09	0.0001	58.1
TG	rs4410790	7	17284577	t	-0.012	0.002	1.4E-09	0.0001	43.2
TG	rs10235225	7	25905599	a	0.015	0.002	1.3E-09	0.0001	64.9
TG	rs4722551	7	25991826	t	0.019	0.003	1.1E-11	0.0001	63.7
TG	rs1534696	7	26397239	a	-0.019	0.002	2.9E-15	0.0002	110.6
TG	rs2070971	7	44197583	t	0.023	0.003	7.2E-12	0.0001	84.4
TG	rs3757838	7	44231310	a	0.030	0.005	3.8E-11	0.0001	71.5
TG	rs1178979	7	72856430	t	0.044	0.004	1.1E-30	0.0006	353.9
TG	rs799158	7	73019074	t	0.076	0.008	4.0E-21	0.0004	273.6
TG	rs3812316	7	73020337	c	0.087	0.005	4.3E-82	0.0016	987.5
TG	rs287621	7	130435181	t	0.022	0.003	4.7E-19	0.0002	123.0
TG	rs3735080	7	150217309	t	0.016	0.002	2.6E-11	0.0001	56.2
TG	rs16884656	7	150512307	t	-0.024	0.004	8.3E-09	0.0001	75.6

TG	rs4240624	8	9184231	a	-0.034	0.004	1.2E-17	0.0002	108.7
TG	rs11776767	8	10683929	c	0.024	0.002	1.3E-27	0.0003	160.1
TG	rs2686187	8	11654796	a	-0.014	0.002	3.7E-09	0.0001	60.5
TG	rs3947	8	11702375	a	0.019	0.002	7.1E-15	0.0001	86.5
TG	rs1495741	8	18272881	a	-0.036	0.002	3.4E-56	0.0005	296.3
TG	rs1801177	8	19805708	a	0.095	0.009	1.1E-26	0.0003	202.0
TG	rs264	8	19813180	a	-0.028	0.003	7.9E-17	0.0002	120.1
TG	rs268	8	19813529	a	-0.232	0.008	5.5E-202	0.0017	1058.9
TG	rs301	8	19816934	t	0.062	0.005	2.8E-36	0.0015	904.3
TG	rs312	8	19817997	c	0.048	0.006	1.4E-13	0.0005	302.0
TG	rs326	8	19819439	a	0.078	0.005	6.7E-63	0.0026	1582.2
TG	rs12545984	8	19847259	t	0.044	0.006	2.1E-13	0.0005	316.6
TG	rs17091905	8	19849757	a	-0.042	0.006	1.5E-13	0.0004	237.7
TG	rs10105418	8	19875365	a	0.082	0.009	1.9E-21	0.0003	208.6
TG	rs4637851	8	19922610	a	-0.029	0.003	8.5E-22	0.0004	236.0
TG	rs13256965	8	19962962	a	0.017	0.002	7.5E-12	0.0001	84.7
TG	rs3736147	8	22471824	a	0.018	0.003	1.7E-10	0.0001	86.9
TG	rs1982768	8	25898565	a	-0.022	0.004	3.0E-09	0.0001	74.8
TG	rs2081687	8	59388565	t	0.019	0.002	9.5E-20	0.0002	102.6
TG	rs4738141	8	72469742	a	-0.017	0.003	1.6E-09	0.0001	67.1
TG	rs17730649	8	126465305	a	0.021	0.003	3.8E-16	0.0002	137.4
TG	rs6982502	8	126479362	t	-0.028	0.005	5.1E-09	0.0004	238.0
TG	rs2980876	8	126481694	t	-0.091	0.005	1.4E-73	0.0036	2230.5
TG	rs8180991	8	126500350	c	-0.034	0.003	2.6E-24	0.0004	260.5
TG	rs4871624	8	126629328	t	-0.020	0.003	1.0E-14	0.0002	100.1
TG	rs3927680	9	16887366	a	-0.016	0.002	1.2E-15	0.0001	78.1
TG	rs4120895	9	33787532	t	-0.018	0.003	4.3E-11	0.0001	92.3
TG	rs1800978	9	107665978	c	0.027	0.004	2.9E-13	0.0002	101.9
TG	rs17134592	10	5260682	c	0.021	0.003	4.3E-10	0.0001	64.6
TG	rs41274050	10	52573772	t	0.094	0.011	2.7E-17	0.0003	209.2
TG	rs7923609	10	65133822	a	0.030	0.003	1.2E-21	0.0004	270.8
TG	rs2298117	10	70346740	t	0.012	0.002	1.0E-09	0.0001	45.7
TG	rs7901016	10	74637326	t	-0.040	0.004	3.5E-20	0.0002	114.7
TG	rs10748579	10	94090498	a	-0.018	0.002	1.9E-18	0.0002	95.4
TG	rs7081888	10	94764660	t	-0.033	0.005	1.7E-11	0.0002	97.4
TG	rs2068888	10	94839642	a	-0.037	0.002	5.8E-71	0.0007	415.5
TG	rs2792751	10	113940329	t	-0.018	0.002	7.5E-16	0.0001	81.0
TG	rs11195943	10	114154815	t	-0.023	0.004	2.0E-10	0.0001	60.3
TG	rs10886863	10	122929493	t	-0.058	0.010	4.3E-09	0.0002	110.1
TG	rs7940646	11	10669228	t	-0.015	0.002	4.4E-12	0.0001	59.5
TG	rs10832027	11	13357183	a	0.016	0.002	1.8E-11	0.0001	68.7
TG	rs546383	11	18065663	t	-0.013	0.002	7.6E-09	0.0001	52.6
TG	rs925946	11	27667202	t	0.016	0.002	7.6E-14	0.0001	68.9
TG	rs326214	11	47298360	a	0.022	0.002	4.1E-26	0.0002	130.6
TG	rs2727271	11	61603358	a	-0.065	0.003	1.8E-78	0.0009	586.7
TG	rs174587	11	61612830	t	0.048	0.003	6.9E-50	0.0008	467.7
TG	rs35169799	11	64031241	t	0.041	0.004	4.8E-24	0.0002	120.4
TG	rs4014195	11	65506822	c	-0.015	0.002	2.6E-12	0.0001	60.8
TG	rs2229738	11	68562328	t	0.024	0.004	1.6E-10	0.0001	50.8
TG	rs11237471	11	78082604	t	-0.022	0.003	1.7E-10	0.0001	83.7
TG	rs4938289	11	116458785	t	0.047	0.006	1.3E-14	0.0003	164.7
TG	rs12799766	11	116558427	a	0.042	0.005	3.7E-19	0.0006	377.5
TG	rs74360954	11	116582542	t	-0.113	0.008	1.5E-43	0.0013	804.6

TG	rs2000571	11	116585533	a	0.063	0.006	1.5E-26	0.0013	811.0
TG	rs180357	11	116599504	t	-0.049	0.005	4.2E-24	0.0010	626.6
TG	rs4938307	11	116604514	a	-0.073	0.007	4.7E-28	0.0011	683.7
TG	rs61730763	11	116631482	a	0.190	0.023	2.9E-16	0.0002	128.9
TG	rs17120029	11	116650118	t	0.142	0.009	1.2E-56	0.0025	1576.5
TG	rs11604424	11	116651115	t	-0.066	0.006	1.5E-27	0.0015	930.8
TG	rs619054	11	116660813	a	-0.057	0.004	1.1E-36	0.0012	716.3
TG	rs143292359	11	116661001	a	0.241	0.040	1.5E-09	0.0001	57.6
TG	rs662799	11	116663707	a	-0.106	0.008	1.2E-43	0.0015	914.6
TG	rs9804646	11	116665079	t	-0.060	0.006	2.8E-23	0.0006	355.6
TG	rs5104	11	116692334	t	-0.035	0.004	1.6E-17	0.0003	190.7
TG	rs11216157	11	116711180	a	0.055	0.007	1.2E-16	0.0007	434.1
TG	rs888246	11	116724232	t	0.071	0.006	9.5E-29	0.0009	550.3
TG	rs2075292	11	116732512	t	-0.063	0.005	8.4E-40	0.0009	545.8
TG	rs11216168	11	116741553	a	-0.069	0.006	5.3E-27	0.0012	726.5
TG	rs2000615	11	116915819	t	0.057	0.006	4.0E-21	0.0007	430.3
TG	rs490262	11	117222592	a	-0.019	0.003	2.2E-13	0.0001	67.1
TG	rs7134375	12	20473758	a	-0.014	0.002	7.4E-13	0.0001	61.9
TG	rs4149056	12	21331549	t	-0.032	0.003	3.3E-30	0.0003	159.4
TG	rs718314	12	26453283	a	-0.019	0.003	1.4E-14	0.0001	87.3
TG	rs7979398	12	46086708	t	0.015	0.002	9.3E-11	0.0001	68.1
TG	rs11613352	12	57792580	t	-0.025	0.003	5.8E-20	0.0002	131.4
TG	rs2075260	12	109696838	a	0.015	0.003	4.6E-09	0.0001	41.5
TG	rs3742004	12	111798553	a	0.016	0.003	9.8E-09	0.0001	53.4
TG	rs940904	12	123491572	a	0.015	0.003	4.2E-09	0.0001	55.3
TG	rs11057408	12	124464836	t	-0.022	0.002	2.7E-20	0.0002	138.5
TG	rs10846744	12	125312425	c	0.027	0.003	1.3E-15	0.0002	121.2
TG	rs2298058	13	95248566	t	0.024	0.003	5.4E-17	0.0003	157.7
TG	rs7400722	13	114527838	a	0.016	0.002	1.9E-12	0.0001	71.6
TG	rs7157785	14	64235556	t	0.020	0.003	7.1E-13	0.0001	71.3
TG	rs11634257	15	40388492	a	0.018	0.003	1.5E-09	0.0001	74.5
TG	rs17747633	15	40916237	a	-0.015	0.002	4.6E-12	0.0001	63.2
TG	rs16949992	15	44238869	c	-0.075	0.006	5.7E-34	0.0005	293.5
TG	rs11858955	15	44246293	a	-0.115	0.016	3.8E-13	0.0002	133.3
TG	rs493258	15	58687880	t	0.017	0.002	1.4E-17	0.0001	89.9
TG	rs12913346	15	63530965	a	0.024	0.004	4.1E-11	0.0001	83.5
TG	rs17184382	15	63792486	a	0.017	0.002	3.9E-13	0.0001	88.9
TG	rs2415168	15	73109629	a	0.015	0.003	3.2E-09	0.0001	55.8
TG	rs10152471	15	101890913	a	-0.016	0.003	4.9E-09	0.0001	74.6
TG	rs143076454	16	921179	a	0.048	0.008	6.8E-09	0.0001	48.6
TG	rs11075253	16	15148646	a	-0.027	0.003	2.6E-15	0.0003	185.3
TG	rs2032915	16	31117413	t	-0.017	0.002	5.4E-14	0.0001	87.0
TG	rs9939609	16	53820527	a	0.019	0.002	2.0E-21	0.0002	106.8
TG	rs1800775	16	56995236	a	-0.023	0.002	3.4E-27	0.0003	162.2
TG	rs7203984	16	56999258	a	-0.022	0.003	5.2E-12	0.0002	97.0
TG	rs9940315	16	69876164	a	-0.019	0.003	4.7E-13	0.0002	107.5
TG	rs2000999	16	72108093	a	0.020	0.003	7.3E-15	0.0001	81.3
TG	rs12443634	16	81524274	a	0.018	0.003	9.3E-10	0.0001	84.4
TG	rs1053328	16	85711860	t	0.014	0.002	8.8E-09	0.0001	54.3
TG	rs3853818	17	7346302	t	0.016	0.002	6.5E-12	0.0001	75.9
TG	rs897453	17	17425631	t	-0.014	0.002	1.1E-12	0.0001	61.2
TG	rs1563631	17	18221134	t	-0.017	0.002	6.7E-15	0.0001	75.2
TG	rs3110454	17	28651363	t	-0.017	0.003	7.4E-10	0.0001	83.3

TG	rs2306590	17	34854280	a	-0.013	0.002	5.0E-10	0.0001	50.3
TG	rs2079005	17	41865627	t	-0.022	0.003	6.2E-15	0.0002	104.3
TG	rs1662750	17	42011823	a	-0.018	0.003	1.4E-11	0.0002	95.0
TG	rs2074108	17	42336149	t	-0.015	0.002	1.1E-09	0.0001	64.6
TG	rs11871606	17	45732774	a	0.016	0.002	3.4E-16	0.0001	82.2
TG	rs8075803	17	47346529	t	-0.019	0.002	1.3E-16	0.0002	111.7
TG	rs12602912	17	65870073	t	0.023	0.002	1.2E-21	0.0002	100.9
TG	rs2125345	17	73782191	t	0.013	0.002	1.8E-09	0.0001	46.5
TG	rs2292642	17	76395430	t	-0.021	0.002	4.3E-25	0.0002	125.4
TG	rs1652343	18	21131929	t	0.016	0.003	2.0E-09	0.0001	75.1
TG	rs17178414	19	4945250	t	0.019	0.003	1.0E-10	0.0002	97.1
TG	rs1799816	19	7125518	t	-0.068	0.011	6.4E-10	0.0001	47.6
TG	rs7248104	19	7224431	a	-0.019	0.002	1.5E-21	0.0002	108.6
TG	rs116843064	19	8429323	a	-0.265	0.007	3.8E-295	0.0036	2223.6
TG	rs140744493	19	8436373	t	-0.121	0.019	1.5E-10	0.0001	50.5
TG	rs1862644	19	18724315	a	-0.017	0.003	2.2E-09	0.0001	86.6
TG	rs117877390	19	19378416	t	-0.103	0.011	1.7E-21	0.0006	357.1
TG	rs10401969	19	19407718	t	0.095	0.004	5.2E-150	0.0013	824.6
TG	rs145702982	19	19579726	a	0.119	0.021	6.2E-09	0.0003	172.3
TG	rs8182584	19	33909710	t	0.017	0.002	2.7E-15	0.0001	81.6
TG	rs1688030	19	35556744	t	-0.033	0.005	5.5E-13	0.0001	78.8
TG	rs2018519	19	35559787	t	-0.021	0.003	8.9E-11	0.0001	74.7
TG	rs28399653	19	45315445	a	0.041	0.006	5.5E-12	0.0001	60.1
TG	rs4803760	19	45333834	t	0.021	0.003	1.3E-11	0.0001	83.5
TG	rs157582	19	45396219	t	0.042	0.004	7.5E-24	0.0006	383.4
TG	rs439401	19	45414451	t	-0.080	0.002	1.2E-229	0.0030	1869.3
TG	rs59325138	19	45416291	t	-0.040	0.003	1.2E-31	0.0008	469.6
TG	rs7259004	19	45432557	c	0.064	0.005	2.3E-45	0.0008	463.7
TG	rs2287922	19	49232226	a	0.018	0.002	4.0E-17	0.0002	96.4
TG	rs1132990	19	50028163	a	-0.018	0.003	4.2E-09	0.0001	63.0
TG	rs6029143	20	39118662	t	-0.035	0.005	8.6E-13	0.0001	92.4
TG	rs6016381	20	39180436	t	0.018	0.002	8.4E-15	0.0001	92.0
TG	rs1997833	20	39690342	t	-0.016	0.003	1.2E-09	0.0001	61.0
TG	rs3827066	20	44586023	t	-0.043	0.004	4.3E-28	0.0005	308.0
TG	rs8123864	20	44598670	t	-0.044	0.003	2.0E-46	0.0009	535.9
TG	rs1211644	20	45592842	t	0.024	0.003	2.8E-15	0.0002	131.0
TG	rs2426428	20	50886412	t	-0.031	0.005	2.3E-11	0.0001	92.2
TG	rs6025606	20	56098733	t	-0.013	0.002	7.4E-10	0.0001	48.3
TG	rs41302559	20	56140439	a	-0.145	0.021	1.8E-12	0.0001	61.9
TG	rs114139997	21	46875775	a	-0.365	0.039	2.9E-21	0.0003	180.4
TG	rs200559406	21	46875817	a	0.282	0.036	6.6E-15	0.0001	78.5
TG	rs35665085	22	17625915	a	0.032	0.005	1.9E-12	0.0001	61.4
TG	rs738322	22	38569006	a	0.021	0.002	9.2E-26	0.0002	135.9
TG	rs5757161	22	38990662	a	0.016	0.003	1.6E-10	0.0001	72.5
TG	rs738409	22	44324727	c	0.017	0.002	4.0E-12	0.0001	59.6

Supplementary Table 3. Trait-specific genetic instruments for blood lipid levels selected from the Global Lipids Genetics Consortium (GLGC) dataset. Variants were selected on the basis of their association with the respective trait at p<5E-8 and a p>0.01 regarding their associaton with the other two traits.

			Associations with HDL-C			Associations with LDL-C			Associations with TG		
Phenotype	**SNP**	**Eff_allele**	**Effect**	**SE**	**P-value**	**Effect**	**SE**	**P-value**	**Effect**	**SE**	**P-value**
HDL-C	rs103294	t	0.052	0.004	4.00E-30	0.007	0.005	0.123	-0.002	0.004	0.752
HDL-C	rs10773105	t	-0.036	0.004	3.20E-24	0.006	0.004	0.122	0.004	0.003	0.509
HDL-C	rs11246602	c	0.034	0.005	1.68E-10	0.002	0.006	0.526	-0.009	0.005	0.192
HDL-C	rs12226802	g	0.033	0.005	1.29E-09	0	0.005	0.619	-0.007	0.005	0.23
HDL-C	rs16942887	a	0.083	0.005	8.28E-54	0.001	0.005	0.798	-0.012	0.005	0.0296
HDL-C	rs17695224	g	0.029	0.004	2.42E-13	0.011	0.004	0.0125	-0.012	0.004	0.0113
HDL-C	rs181362	c	0.038	0.004	9.24E-18	0.007	0.005	0.0793	0.009	0.004	0.0281
HDL-C	rs205262	a	0.028	0.004	3.88E-13	0.009	0.004	0.0313	-0.003	0.004	0.803
HDL-C	rs2240327	g	0.024	0.003	1.11E-11	0.001	0.004	0.971	-0.002	0.003	0.867
HDL-C	rs2241210	g	0.033	0.004	2.49E-20	0.008	0.004	0.0855	0.003	0.003	0.247
HDL-C	rs2290547	a	-0.03	0.005	3.69E-09	0.001	0.005	0.793	0.01	0.004	0.0221
HDL-C	rs2472509	g	0.023	0.004	1.21E-09	0	0.004	0.708	-0.002	0.004	0.722
HDL-C	rs2602836	g	-0.019	0.003	4.96E-08	0.001	0.004	0.831	0.009	0.003	0.0212
HDL-C	rs4650994	a	-0.021	0.003	6.70E-09	0.003	0.004	0.338	0.002	0.003	0.398
HDL-C	rs4917014	g	0.022	0.004	1.03E-08	0.005	0.004	0.246	-0.001	0.004	0.887
HDL-C	rs4983559	g	0.02	0.004	9.57E-09	0.003	0.004	0.583	0	0.004	0.971
HDL-C	rs499974	a	-0.026	0.004	1.12E-08	0.001	0.005	0.826	-0.009	0.004	0.0541
HDL-C	rs702485	g	0.024	0.003	6.45E-12	0.001	0.004	0.787	-0.002	0.003	0.475
HDL-C	rs838876	g	-0.049	0.004	7.33E-33	0.003	0.004	0.442	0.005	0.004	0.377
LDL-C	rs1010167	g	-0.004	0.004	0.396	0.025	0.004	6.22E-11	0.002	0.004	0.808
LDL-C	rs11563251	t	0.006	0.006	0.365	0.035	0.006	4.50E-08	0.008	0.006	0.0826
LDL-C	rs1250229	c	-0.003	0.004	0.404	0.024	0.004	3.13E-08	0.009	0.004	0.0139
LDL-C	rs12670798	c	-0.001	0.004	0.733	0.034	0.004	4.81E-14	0.01	0.004	0.0168
LDL-C	rs16831243	t	0.011	0.005	0.039	0.038	0.006	9.06E-12	-0.001	0.005	0.987
LDL-C	rs17508045	t	-0.009	0.006	0.0466	0.049	0.007	4.91E-12	-0.008	0.006	0.4
LDL-C	rs1800562	g	0.007	0.007	0.242	0.062	0.008	8.25E-14	-0.013	0.007	0.172
LDL-C	rs2030746	t	-0.003	0.004	0.306	0.021	0.004	8.61E-09	0.003	0.004	0.491
LDL-C	rs2294261	a	-0.009	0.004	0.0206	0.033	0.004	6.57E-17	0.002	0.003	0.587
LDL-C	rs2328223	c	0	0.005	0.859	0.03	0.005	5.63E-09	-0.007	0.005	0.115
LDL-C	rs314253	t	-0.003	0.004	0.353	0.024	0.004	3.44E-10	0.009	0.003	0.0298
LDL-C	rs364585	g	0.001	0.004	0.822	0.025	0.004	4.28E-10	-0.002	0.003	0.44
LDL-C	rs3780181	a	0.004	0.007	0.542	0.045	0.007	1.76E-09	-0.007	0.007	0.491
LDL-C	rs4148218	g	-0.003	0.004	0.456	0.044	0.005	6.76E-21	0.004	0.004	0.295
LDL-C	rs4530754	a	0.001	0.003	0.934	0.028	0.004	3.58E-12	0.002	0.003	0.742
LDL-C	rs6065311	c	0.002	0.003	0.437	0.042	0.004	1.66E-30	0.006	0.003	0.0227
LDL-C	rs6489818	a	0	0.005	0.928	0.028	0.005	4.57E-09	-0.004	0.004	0.54
LDL-C	rs6603981	t	0.004	0.004	0.381	0.034	0.004	3.10E-13	0.007	0.004	0.174
LDL-C	rs7225700	c	0.01	0.004	0.0235	0.03	0.004	3.56E-13	-0.005	0.004	0.236
LDL-C	rs7703051	a	0.002	0.004	0.421	0.073	0.004	1.40E-77	0.006	0.003	0.163
LDL-C	rs7832643	t	-0.001	0.004	0.595	0.034	0.004	2.67E-17	0.002	0.003	0.472
LDL-C	rs7832643	t	-0.001	0.004	0.595	0.034	0.004	2.67E-17	0.002	0.003	0.472
LDL-C	rs8017377	a	-0.004	0.004	0.434	0.03	0.004	2.52E-15	0.006	0.004	0.142
LDL-C	rs8176720	t	0.001	0.004	0.943	0.033	0.004	1.59E-17	-0.007	0.004	0.0609
LDL-C	rs903319	c	0.01	0.004	0.0122	0.027	0.004	5.22E-11	-0.005	0.004	0.138
TG	rs10029254	t	-0.009	0.004	0.0487	0.006	0.004	0.205	0.027	0.004	7.55E-09
TG	rs1781930	g	0.002	0.005	0.625	0.01	0.005	0.057	0.031	0.004	2.51E-11
TG	rs603446	c	-0.002	0.004	0.873	0.009	0.004	0.0114	0.05	0.003	3.92E-43
TG	rs9693857	c	0.004	0.004	0.527	0.005	0.004	0.298	-0.02	0.003	1.69E-08

Supplementary Table 4. Genetic instruments for the circulating cholesterol and triglyceride concentrations of the lipoprotein particles as seleted and extracted from the dataset of the GWAS meta-analysis on Nuclear Magnetic Resonance (NMR)-measured circulating metabolites.

Metabolite	SNP	Chr	Position (hg18)	Eff_allele	Effect	SE	P-value	R2	F
L.HDL.C	rs1077835	15	58723426	G	0.181	0.012	1.39E-53	0.0122	265.5
L.HDL.C	rs11076174	16	57003146	C	-0.134	0.016	1.17E-16	0.0035	76.7
L.HDL.C	rs11076176	16	57007446	G	-0.171	0.014	1.62E-34	0.0081	176.2
L.HDL.C	rs111543310	15	59531818	C	0.338	0.049	6.88E-12	0.0036	69.2
L.HDL.C	rs112835635	15	59351989	G	0.263	0.035	2.13E-13	0.0031	63.2
L.HDL.C	rs112884731	15	59504897	C	0.544	0.057	2.75E-21	0.0055	98.4
L.HDL.C	rs113298164	15	58855748	T	0.584	0.047	2.74E-34	0.0092	165.4
L.HDL.C	rs116142092	15	59751872	T	0.383	0.050	5.61E-14	0.0034	61.4
L.HDL.C	rs11633043	15	58837722	A	0.078	0.014	2.57E-08	0.0017	36.4
L.HDL.C	rs117901517	15	58678869	C	-0.142	0.023	5.22E-10	0.0030	58.2
L.HDL.C	rs1318175	15	58586129	T	-0.087	0.013	5.41E-11	0.0022	47.1
L.HDL.C	rs1367117	2	21263900	A	-0.063	0.011	1.50E-08	0.0016	35.1
L.HDL.C	rs1373657	15	58717762	T	0.165	0.030	4.42E-08	0.0021	38.2
L.HDL.C	rs138690293	15	59310760	C	0.722	0.107	2.61E-11	0.0039	62.4
L.HDL.C	rs142855631	15	59286876	T	0.737	0.108	1.33E-11	0.0039	63.1
L.HDL.C	rs146842281	15	59356659	T	0.154	0.022	3.53E-12	0.0027	52.8
L.HDL.C	rs148902553	15	59776836	C	0.388	0.051	3.48E-14	0.0036	62.1
L.HDL.C	rs16940472	15	58835317	A	0.130	0.020	2.49E-10	0.0026	56.9
L.HDL.C	rs16940810	15	59115159	T	0.252	0.030	5.86E-17	0.0038	77.2
L.HDL.C	rs17301746	15	58731395	T	0.265	0.038	5.18E-12	0.0029	63.1
L.HDL.C	rs174583	11	61609750	T	-0.078	0.010	2.92E-14	0.0029	62.4
L.HDL.C	rs17821274	15	58684478	C	-0.086	0.010	3.91E-16	0.0033	72.3
L.HDL.C	rs17821298	15	58690738	A	0.092	0.012	7.20E-15	0.0030	65.7
L.HDL.C	rs1800777	16	57017319	A	-0.234	0.035	4.04E-11	0.0027	51.6
L.HDL.C	rs181412360	15	59158953	C	0.378	0.038	6.01E-23	0.0059	106.4
L.HDL.C	rs182776276	15	59254589	G	0.573	0.060	2.84E-21	0.0056	96.2
L.HDL.C	rs183975744	15	59052479	T	0.747	0.120	7.21E-10	0.0028	43.1
L.HDL.C	rs185241689	15	59143155	G	0.810	0.114	1.96E-12	0.0039	64.0
L.HDL.C	rs185481	15	58666679	C	0.069	0.010	2.68E-11	0.0024	51.0
L.HDL.C	rs186924495	20	44686926	T	-0.207	0.037	3.38E-08	0.0018	32.6
L.HDL.C	rs1883025	9	107664301	T	-0.072	0.012	9.85E-09	0.0016	35.1
L.HDL.C	rs189375934	15	60196526	G	0.310	0.053	6.61E-09	0.0022	38.1
L.HDL.C	rs189418461	15	59725202	G	0.379	0.050	5.52E-14	0.0034	61.2
L.HDL.C	rs192630343	15	59286102	A	0.708	0.107	5.45E-11	0.0038	62.1
L.HDL.C	rs247617	16	56990716	A	0.210	0.011	1.93E-82	0.0184	403.3
L.HDL.C	rs261291	15	58680178	C	0.179	0.010	2.39E-68	0.0151	329.4
L.HDL.C	rs28370984	15	58629308	C	0.177	0.032	3.98E-08	0.0017	33.7
L.HDL.C	rs291	8	19815852	C	0.101	0.012	1.45E-17	0.0036	77.8
L.HDL.C	rs34718390	15	58682690	A	0.156	0.024	6.31E-11	0.0028	61.5
L.HDL.C	rs35547826	15	58720405	A	-0.084	0.014	7.63E-09	0.0017	37.6
L.HDL.C	rs429358	19	45411941	C	-0.092	0.013	1.46E-11	0.0024	51.1
L.HDL.C	rs435306	20	44538484	T	-0.073	0.011	2.88E-10	0.0020	42.2
L.HDL.C	rs517755	19	45009036	C	-0.229	0.041	3.58E-08	0.0019	36.8
L.HDL.C	rs55995508	16	56827946	A	0.159	0.025	4.93E-10	0.0023	44.6
L.HDL.C	rs6065904	20	44534651	A	-0.135	0.012	1.72E-30	0.0065	140.2
L.HDL.C	rs6499857	16	56935090	C	-0.067	0.012	3.70E-08	0.0015	32.8
L.HDL.C	rs6507939	18	47176261	C	0.095	0.013	3.34E-12	0.0024	51.2
L.HDL.C	rs6544366	2	21204025	T	0.064	0.011	8.14E-09	0.0016	34.8
L.HDL.C	rs67053123	12	125353810	A	0.092	0.015	3.90E-10	0.0021	46.3

L.HDL.C	rs73959582	18	47148886	C	0.079	0.014	4.62E-08	0.0016	35.2
L.HDL.C	rs7412	19	45412079	T	0.158	0.025	8.48E-10	0.0026	48.2
L.HDL.C	rs75835816	8	19885513	C	-0.293	0.038	2.87E-14	0.0033	63.3
L.HDL.C	rs76083992	20	44544798	T	-0.229	0.032	2.01E-12	0.0026	51.8
L.HDL.C	rs76116860	15	59834938	C	0.277	0.041	2.66E-11	0.0027	52.2
L.HDL.C	rs79844529	15	58445279	T	0.190	0.032	3.43E-09	0.0024	45.8
L.HDL.C	rs8042174	15	58685970	C	-0.112	0.020	2.10E-08	0.0018	38.0
L.HDL.C	rs938507	15	58582034	A	0.101	0.014	2.89E-12	0.0024	51.2
L.HDL.C	rs964184	11	116648917	C	0.082	0.014	8.07E-09	0.0016	34.5
M.LDL.C	rs10424477	19	10636051	T	-0.071	0.011	1.53E-09	0.0021	46.4
M.LDL.C	rs111740198	19	44878217	A	-0.321	0.052	1.22E-09	0.0033	48.4
M.LDL.C	rs112635299	14	94838142	T	0.237	0.040	4.03E-09	0.0020	39.4
M.LDL.C	rs11587071	1	55522674	T	-0.092	0.014	1.95E-11	0.0023	49.1
M.LDL.C	rs116054287	1	56401689	C	-0.397	0.038	4.41E-25	0.0058	126.0
M.LDL.C	rs117261169	19	45491032	T	-0.361	0.055	1.44E-10	0.0025	48.6
M.LDL.C	rs117569256	19	45423330	G	-0.821	0.107	4.27E-14	0.0068	91.9
M.LDL.C	rs11878174	19	45723379	C	0.073	0.012	6.11E-10	0.0026	51.0
M.LDL.C	rs12043403	1	55431933	C	-0.138	0.018	3.27E-14	0.0038	73.8
M.LDL.C	rs12086676	1	55738663	T	-0.076	0.013	2.68E-09	0.0018	38.8
M.LDL.C	rs12916	5	74656539	C	0.084	0.010	1.86E-16	0.0034	73.7
M.LDL.C	rs137992968	19	11239696	T	-0.204	0.034	3.32E-09	0.0018	39.1
M.LDL.C	rs138270540	4	75353427	C	0.226	0.036	9.95E-10	0.0025	46.3
M.LDL.C	rs138287365	4	74781004	C	0.373	0.050	2.70E-13	0.0037	68.3
M.LDL.C	rs138525976	1	55960656	A	-0.103	0.018	2.24E-08	0.0017	35.7
M.LDL.C	rs140339333	4	75396456	A	0.288	0.045	2.32E-10	0.0030	55.3
M.LDL.C	rs140411770	19	45356517	A	-0.542	0.088	1.58E-09	0.0049	76.2
M.LDL.C	rs142130958	19	11190652	A	-0.221	0.016	2.19E-40	0.0092	200.6
M.LDL.C	rs143413051	4	75560225	T	0.381	0.055	1.05E-11	0.0034	57.9
M.LDL.C	rs143736900	4	72871285	C	0.594	0.083	2.35E-12	0.0045	71.5
M.LDL.C	rs144591518	19	10518992	T	-0.194	0.034	3.05E-08	0.0016	34.0
M.LDL.C	rs144721118	1	54196340	A	-0.270	0.040	1.94E-11	0.0034	65.0
M.LDL.C	rs146568567	1	54824117	A	-0.315	0.032	1.24E-22	0.0054	104.9
M.LDL.C	rs147319495	2	20912953	G	-0.064	0.011	8.09E-09	0.0017	36.9
M.LDL.C	rs147825223	19	45479553	C	0.173	0.028	1.92E-09	0.0022	39.8
M.LDL.C	rs148359521	2	21414212	T	-0.187	0.032	8.31E-09	0.0020	39.0
M.LDL.C	rs148382396	1	54639713	A	-0.390	0.051	5.53E-14	0.0044	70.1
M.LDL.C	rs149048538	19	45053024	A	-0.282	0.044	1.91E-10	0.0025	47.8
M.LDL.C	rs149844719	1	54519237	T	-0.183	0.028	1.18E-10	0.0023	50.7
M.LDL.C	rs149944945	1	56129361	G	-0.292	0.034	3.47E-17	0.0043	82.3
M.LDL.C	rs150785555	1	56005603	A	-0.451	0.036	1.28E-35	0.0090	175.6
M.LDL.C	rs150966173	19	45421204	T	0.225	0.039	1.01E-08	0.0020	39.4
M.LDL.C	rs150985779	19	45147992	T	-0.269	0.038	2.86E-12	0.0031	59.1
M.LDL.C	rs151193598	4	73303394	A	0.634	0.087	8.45E-13	0.0061	82.8
M.LDL.C	rs157594	19	45425175	G	0.133	0.012	4.31E-29	0.0086	167.0
M.LDL.C	rs17111503	1	55503448	G	0.075	0.013	1.34E-08	0.0018	39.6
M.LDL.C	rs17395160	1	55085141	G	-0.086	0.012	2.42E-12	0.0025	53.1
M.LDL.C	rs180961170	1	57012269	G	-0.364	0.052	4.27E-12	0.0037	65.6
M.LDL.C	rs181066897	4	73499882	C	0.515	0.080	2.30E-10	0.0041	66.1
M.LDL.C	rs181169081	2	21312870	A	-0.185	0.032	1.07E-08	0.0020	38.2
M.LDL.C	rs181594442	1	57006537	A	-0.364	0.052	4.33E-12	0.0037	65.6
M.LDL.C	rs181847072	4	73134560	G	0.592	0.083	1.85E-12	0.0046	72.3
M.LDL.C	rs182300850	1	54389320	C	-0.371	0.060	1.06E-09	0.0032	48.4
M.LDL.C	rs182318839	19	45747128	T	0.300	0.054	3.77E-08	0.0027	47.3

M.LDL.C	rs184566992	19	44887996	T	-0.353	0.052	2.52E-11	0.0037	58.6
M.LDL.C	rs184650103	4	74850649	T	0.406	0.047	2.78E-17	0.0045	77.6
M.LDL.C	rs185049786	4	74644512	C	0.335	0.054	1.08E-09	0.0034	62.6
M.LDL.C	rs185415345	1	56625395	A	-0.168	0.027	1.48E-09	0.0025	48.2
M.LDL.C	rs185802315	19	10777054	G	-0.231	0.036	2.50E-10	0.0025	44.8
M.LDL.C	rs185886292	19	45565918	T	0.184	0.032	1.51E-08	0.0021	37.3
M.LDL.C	rs186538116	1	56840574	C	-0.421	0.045	1.49E-20	0.0059	105.9
M.LDL.C	rs188099946	19	45189605	T	-0.296	0.045	1.06E-10	0.0022	48.6
M.LDL.C	rs189409600	19	45341066	T	-0.749	0.103	8.32E-13	0.0060	83.6
M.LDL.C	rs189718275	19	45063850	A	-0.296	0.044	3.75E-11	0.0028	53.2
M.LDL.C	rs190217562	4	75180409	C	0.251	0.035	1.36E-12	0.0059	106.0
M.LDL.C	rs190934192	1	55334001	A	-0.385	0.040	2.23E-21	0.0069	134.8
M.LDL.C	rs191210370	1	54236244	G	-0.212	0.038	3.42E-08	0.0021	40.7
M.LDL.C	rs191404723	1	54636232	T	-0.390	0.051	4.44E-14	0.0041	71.1
M.LDL.C	rs191448950	1	55584844	A	-0.484	0.032	1.80E-51	0.0111	243.0
M.LDL.C	rs192012905	19	44463485	G	-0.340	0.053	1.93E-10	0.0029	52.4
M.LDL.C	rs192570155	1	55246601	C	-0.492	0.045	4.04E-27	0.0085	152.5
M.LDL.C	rs193084249	1	26987646	G	0.182	0.031	1.04E-08	0.0021	39.7
M.LDL.C	rs2007708	19	45410420	A	-0.831	0.104	3.41E-15	0.0054	99.4
M.LDL.C	rs207176	1	55791846	T	0.121	0.017	2.14E-12	0.0026	55.4
M.LDL.C	rs2207132	20	39142516	A	0.137	0.025	3.69E-08	0.0021	40.8
M.LDL.C	rs2927472	19	45349369	C	0.151	0.018	6.13E-17	0.0041	88.8
M.LDL.C	rs2965149	19	45190766	C	-0.069	0.011	1.57E-10	0.0022	47.7
M.LDL.C	rs2967668	19	45302951	G	-0.178	0.017	4.32E-25	0.0071	137.2
M.LDL.C	rs2980875	8	126481747	G	-0.058	0.010	5.86E-09	0.0017	36.1
M.LDL.C	rs312030	2	21462743	C	0.108	0.018	1.25E-09	0.0019	41.9
M.LDL.C	rs3185010	19	11275842	A	0.064	0.011	5.50E-09	0.0017	37.0
M.LDL.C	rs34722314	2	21271707	A	-0.124	0.014	6.82E-18	0.0037	80.2
M.LDL.C	rs3741298	11	116657561	T	-0.072	0.012	1.49E-09	0.0018	39.1
M.LDL.C	rs429358	19	45411941	C	0.220	0.013	2.46E-59	0.0136	298.2
M.LDL.C	rs4609471	1	55493584	A	-0.382	0.030	8.83E-37	0.0113	220.5
M.LDL.C	rs4803748	19	45247048	T	-0.080	0.011	1.32E-13	0.0030	65.5
M.LDL.C	rs55810502	5	74380959	G	0.070	0.012	8.93E-09	0.0017	36.5
M.LDL.C	rs58826447	19	45328379	A	0.070	0.011	1.05E-10	0.0022	48.3
M.LDL.C	rs62117161	19	45233385	G	-0.206	0.020	1.98E-24	0.0054	117.5
M.LDL.C	rs62120794	2	21100426	T	-0.177	0.024	4.41E-13	0.0028	56.8
M.LDL.C	rs629301	1	109818306	T	0.126	0.012	1.62E-25	0.0055	118.9
M.LDL.C	rs6511721	19	11206575	A	-0.092	0.011	6.23E-17	0.0042	91.7
M.LDL.C	rs6663252	1	55630151	C	-0.084	0.012	1.01E-11	0.0024	51.1
M.LDL.C	rs6732011	2	21146521	T	-0.059	0.010	6.73E-09	0.0016	35.4
M.LDL.C	rs6859	19	45382034	G	-0.080	0.010	1.10E-15	0.0032	69.1
M.LDL.C	rs7255743	19	46018119	A	-0.178	0.032	4.50E-08	0.0016	35.0
M.LDL.C	rs73048351	19	45160086	A	-0.415	0.064	2.47E-10	0.0030	58.3
M.LDL.C	rs73066442	7	21592973	G	0.071	0.011	8.03E-10	0.0019	40.9
M.LDL.C	rs73556990	19	44888175	G	-0.326	0.052	8.98E-10	0.0036	50.7
M.LDL.C	rs73564218	19	45665952	C	0.173	0.030	1.27E-08	0.0020	35.4
M.LDL.C	rs74073060	1	55638930	A	-0.478	0.037	1.28E-36	0.0098	190.3
M.LDL.C	rs7412	19	45412079	T	-0.565	0.025	#######	0.0338	638.4
M.LDL.C	rs75647206	1	56947591	T	-0.365	0.050	6.08E-13	0.0035	67.7
M.LDL.C	rs7604788	2	21190024	T	-0.176	0.022	3.01E-15	0.0033	72.3
M.LDL.C	rs76670936	19	45196581	A	-0.145	0.018	1.18E-14	0.0034	74.4
M.LDL.C	rs76866386	2	44075483	C	-0.142	0.018	1.42E-14	0.0029	63.2
M.LDL.C	rs77021821	4	75684215	T	0.251	0.041	1.71E-09	0.0023	42.2

M.LDL.C	rs78620068	2	21524000	A	-0.115	0.017	7.72E-11	0.0022	47.6
M.LDL.C	rs79668907	19	11257169	T	-0.091	0.012	7.58E-13	0.0031	66.3
M.LDL.C	rs79890446	19	45723446	T	-0.234	0.033	2.89E-12	0.0034	65.8
M.LDL.C	rs8106814	19	45441608	C	-0.101	0.014	4.47E-12	0.0035	68.2
M.LDL.C	rs8111962	19	10915324	T	-0.095	0.014	1.59E-11	0.0023	49.6
M.LDL.C	rs934197	2	21267461	A	0.113	0.011	3.50E-24	0.0052	113.4
M.LDL.C	rs984976	5	74910870	G	0.075	0.010	1.30E-13	0.0027	59.0
IDL.TG	rs10495713	2	21200519	G	-0.062	0.010	2.48E-09	0.0019	37.2
IDL.TG	rs113105798	15	59301460	A	0.198	0.036	4.06E-08	0.0018	35.2
IDL.TG	rs113298164	15	58855748	T	0.395	0.047	2.42E-16	0.0042	75.3
IDL.TG	rs113531395	17	4886829	T	-0.246	0.036	2.44E-11	0.0031	59.4
IDL.TG	rs114822153	4	73238544	A	0.244	0.043	1.68E-08	0.0025	48.0
IDL.TG	rs115849089	8	19912370	A	-0.098	0.017	2.05E-08	0.0017	33.7
IDL.TG	rs116054287	1	56401689	C	-0.282	0.038	5.00E-13	0.0031	60.0
IDL.TG	rs116302332	4	75370891	T	0.257	0.040	1.90E-10	0.0028	54.7
IDL.TG	rs11633043	15	58837722	A	0.079	0.014	4.38E-08	0.0018	34.4
IDL.TG	rs116802199	17	4801101	C	-0.235	0.032	3.08E-13	0.0031	58.1
IDL.TG	rs1168041	1	62960250	C	0.084	0.012	1.96E-12	0.0028	53.9
IDL.TG	rs117749052	15	58749309	C	0.216	0.037	9.78E-09	0.0027	51.9
IDL.TG	rs118095054	19	19621301	G	-0.137	0.024	1.34E-08	0.0022	42.5
IDL.TG	rs12043403	1	55431933	C	-0.101	0.018	3.23E-08	0.0020	39.2
IDL.TG	rs1268353	11	116639692	T	-0.064	0.011	1.66E-09	0.0020	37.9
IDL.TG	rs1318175	15	58586129	T	-0.088	0.014	2.89E-10	0.0022	42.6
IDL.TG	rs13329672	15	58699937	T	0.086	0.012	9.82E-13	0.0029	55.6
IDL.TG	rs138195472	15	58672107	T	0.223	0.035	3.10E-10	0.0025	44.3
IDL.TG	rs138287365	4	74781004	C	0.407	0.049	3.37E-16	0.0044	85.3
IDL.TG	rs140250995	4	73723860	C	0.636	0.100	3.37E-10	0.0035	64.6
IDL.TG	rs140339333	4	75396456	A	0.309	0.044	4.64E-12	0.0034	65.8
IDL.TG	rs143413051	4	75560225	T	0.404	0.055	3.05E-13	0.0037	66.9
IDL.TG	rs143736900	4	72871285	C	0.692	0.082	1.08E-16	0.0060	100.2
IDL.TG	rs145347194	15	58670135	C	0.135	0.023	3.51E-09	0.0024	46.2
IDL.TG	rs146568567	1	54824117	A	-0.208	0.032	1.02E-10	0.0024	45.7
IDL.TG	rs146842281	15	59356659	T	0.146	0.022	6.31E-11	0.0024	47.1
IDL.TG	rs149297353	19	20115517	G	-0.192	0.030	2.02E-10	0.0026	50.9
IDL.TG	rs149944945	1	56129361	G	-0.248	0.034	9.23E-13	0.0031	59.1
IDL.TG	rs150392353	2	21320317	C	-0.228	0.032	1.93E-12	0.0030	58.2
IDL.TG	rs150536132	19	19679560	T	-0.183	0.030	1.13E-09	0.0028	50.4
IDL.TG	rs150785555	1	56005603	A	-0.328	0.036	1.74E-19	0.0048	92.2
IDL.TG	rs151193598	4	73303394	A	0.658	0.085	3.13E-14	0.0066	94.0
IDL.TG	rs1532085	15	58683366	G	-0.156	0.010	8.71E-49	0.0117	229.0
IDL.TG	rs157594	19	45425175	G	0.126	0.012	4.34E-26	0.0077	148.6
IDL.TG	rs1663255	15	58514242	T	-0.071	0.011	2.41E-10	0.0022	42.6
IDL.TG	rs16940213	15	58695337	T	0.126	0.013	1.70E-20	0.0046	89.8
IDL.TG	rs17001002	19	10948031	A	-0.094	0.016	8.44E-09	0.0022	35.2
IDL.TG	rs17216525	19	19662220	T	-0.132	0.021	4.39E-10	0.0021	40.7
IDL.TG	rs181066897	4	73499882	C	0.523	0.080	1.17E-10	0.0042	68.2
IDL.TG	rs181169081	2	21312870	A	-0.227	0.032	2.17E-12	0.0030	57.6
IDL.TG	rs181181625	15	59377940	T	0.388	0.058	3.00E-11	0.0027	48.4
IDL.TG	rs181275587	19	20486755	A	-0.167	0.029	2.02E-08	0.0022	39.0
IDL.TG	rs181412360	15	59158953	C	0.255	0.038	3.52E-11	0.0027	48.4
IDL.TG	rs1815786	11	116921390	C	-0.095	0.016	1.47E-09	0.0021	41.5
IDL.TG	rs181807530	17	4774814	G	-0.232	0.032	9.01E-13	0.0032	55.0
IDL.TG	rs181847072	4	73134560	G	0.692	0.082	5.83E-17	0.0062	102.2

IDL.TG	rs183162020	4	73690263	G	0.861	0.115	1.99E-13	0.0086	85.0
IDL.TG	rs183305631	19	19597444	A	-0.218	0.032	1.54E-11	0.0033	59.0
IDL.TG	rs1838504	15	58666410	T	0.099	0.010	1.20E-20	0.0049	94.4
IDL.TG	rs184650103	4	74850649	T	0.430	0.046	6.76E-20	0.0051	90.4
IDL.TG	rs1848922	2	21471603	C	0.113	0.013	7.08E-19	0.0044	84.5
IDL.TG	rs185049786	4	74644512	C	0.358	0.053	3.00E-11	0.0039	74.6
IDL.TG	rs1872741	15	59450895	T	0.073	0.013	3.91E-08	0.0017	32.2
IDL.TG	rs1883711	20	39179822	C	0.155	0.025	6.67E-10	0.0026	49.6
IDL.TG	rs189741280	19	19624481	G	-0.199	0.030	5.27E-11	0.0029	56.1
IDL.TG	rs190121281	19	19252779	A	-0.231	0.033	3.24E-12	0.0036	63.8
IDL.TG	rs190217562	4	75180409	C	0.327	0.040	1.00E-15	0.0040	72.1
IDL.TG	rs190934192	1	55334001	A	-0.246	0.040	1.37E-09	0.0028	55.0
IDL.TG	rs191448950	1	55584844	A	-0.319	0.032	4.51E-23	0.0053	103.5
IDL.TG	rs192570155	1	55246601	C	-0.335	0.045	2.46E-13	0.0039	70.4
IDL.TG	rs193092110	15	58730460	A	0.206	0.036	1.26E-08	0.0020	35.6
IDL.TG	rs247617	16	56990716	A	-0.084	0.011	4.51E-13	0.0029	56.3
IDL.TG	rs261334	15	58726744	C	-0.197	0.012	1.09E-56	0.0138	270.1
IDL.TG	rs2642636	15	58363242	G	-0.062	0.011	1.49E-08	0.0018	34.5
IDL.TG	rs28370984	15	58629308	C	0.215	0.032	3.09E-11	0.0026	49.7
IDL.TG	rs28395406	15	58629349	G	-0.108	0.016	2.50E-11	0.0026	49.6
IDL.TG	rs2954029	8	126490972	T	-0.083	0.010	1.36E-15	0.0035	67.2
IDL.TG	rs3005923	1	56801542	A	-0.250	0.036	1.13E-11	0.0033	64.7
IDL.TG	rs4075673	2	21150787	C	-0.102	0.010	5.92E-22	0.0050	97.5
IDL.TG	rs429358	19	45411941	C	0.122	0.014	3.02E-18	0.0042	81.1
IDL.TG	rs4609471	1	55493584	A	-0.254	0.030	3.64E-17	0.0050	97.2
IDL.TG	rs61999891	15	58299599	A	0.103	0.017	5.16E-09	0.0022	42.0
IDL.TG	rs6511720	19	11202306	T	-0.176	0.017	1.76E-23	0.0056	107.6
IDL.TG	rs6511721	19	11206575	A	-0.070	0.011	5.20E-10	0.0025	47.4
IDL.TG	rs660240	1	109817838	C	0.079	0.012	5.70E-10	0.0021	40.1
IDL.TG	rs74073060	1	55638930	A	-0.323	0.037	1.80E-17	0.0044	86.1
IDL.TG	rs7412	19	45412079	T	-0.263	0.026	2.70E-23	0.0073	116.9
IDL.TG	rs7604788	2	21190024	T	-0.195	0.022	4.58E-18	0.0044	84.8
IDL.TG	rs77021821	4	75684215	T	0.266	0.040	7.83E-11	0.0025	49.2
IDL.TG	rs79192207	2	21417897	C	0.087	0.014	7.29E-10	0.0021	40.5
IDL.TG	rs79225634	5	74619639	T	0.062	0.011	1.60E-08	0.0018	34.0
IDL.TG	rs79660716	15	58521171	G	0.205	0.027	1.68E-13	0.0035	66.9
IDL.TG	rs8042174	15	58685970	C	-0.132	0.020	2.42E-10	0.0024	45.4
IDL.TG	rs8100204	19	19393714	A	-0.118	0.016	1.88E-12	0.0032	61.1
IDL.TG	rs9302635	16	72144174	C	-0.078	0.013	1.27E-08	0.0017	33.7
IDL.TG	rs964184	11	116648917	C	-0.149	0.015	7.59E-24	0.0054	104.8
L.LDL.C	rs10424477	19	10636051	T	-0.082	0.011	1.82E-12	0.0029	63.0
L.LDL.C	rs10449300	1	109381904	G	-0.060	0.011	3.73E-08	0.0016	34.3
L.LDL.C	rs111740198	19	44878217	A	-0.341	0.052	1.13E-10	0.0037	54.4
L.LDL.C	rs114664261	2	21410015	T	0.264	0.046	2.19E-08	0.0027	52.8
L.LDL.C	rs11587071	1	55522674	T	-0.099	0.014	7.48E-13	0.0026	56.0
L.LDL.C	rs116054287	1	56401689	C	-0.397	0.038	3.95E-25	0.0058	126.0
L.LDL.C	rs117261169	19	45491032	T	-0.396	0.055	1.99E-12	0.0030	58.4
L.LDL.C	rs117569256	19	45423330	G	-0.867	0.107	1.42E-15	0.0076	102.6
L.LDL.C	rs11878174	19	45723379	C	0.077	0.012	9.53E-11	0.0029	55.8
L.LDL.C	rs12043403	1	55431933	C	-0.141	0.018	1.20E-14	0.0039	76.2
L.LDL.C	rs12086676	1	55738663	T	-0.081	0.013	2.28E-10	0.0020	44.0
L.LDL.C	rs13014768	2	21514796	G	-0.117	0.017	2.48E-12	0.0025	54.8
L.LDL.C	rs137992968	19	11239696	T	-0.213	0.034	6.08E-10	0.0020	42.8

L.LDL.C	rs138270540	4	75353427	C	0.220	0.036	1.62E-09	0.0023	45.1
L.LDL.C	rs138287365	4	74781004	C	0.346	0.049	4.07E-12	0.0032	61.6
L.LDL.C	rs138525976	1	55960656	A	-0.107	0.018	7.47E-09	0.0018	38.1
L.LDL.C	rs140339333	4	75396456	A	0.266	0.044	2.49E-09	0.0025	48.8
L.LDL.C	rs140411770	19	45356517	A	-0.519	0.088	7.65E-09	0.0044	69.6
L.LDL.C	rs142130958	19	11190652	A	-0.233	0.016	1.07E-44	0.0102	222.7
L.LDL.C	rs143413051	4	75560225	T	0.363	0.055	6.07E-11	0.0030	53.8
L.LDL.C	rs143736900	4	72871285	C	0.540	0.082	1.08E-10	0.0037	60.7
L.LDL.C	rs144064722	4	73406173	G	0.232	0.034	1.82E-11	0.0027	51.3
L.LDL.C	rs144591518	19	10518992	T	-0.196	0.034	1.88E-08	0.0016	35.0
L.LDL.C	rs144721118	1	54196340	A	-0.292	0.040	3.96E-13	0.0039	75.9
L.LDL.C	rs144900553	19	10798974	T	-0.293	0.052	2.35E-08	0.0022	47.8
L.LDL.C	rs146568567	1	54824117	A	-0.332	0.032	4.40E-25	0.0060	116.9
L.LDL.C	rs147319495	2	20912953	G	-0.066	0.011	3.19E-09	0.0018	38.9
L.LDL.C	rs147825223	19	45479553	C	0.166	0.028	8.18E-09	0.0021	36.6
L.LDL.C	rs148359521	2	21414212	T	-0.194	0.032	2.43E-09	0.0022	41.8
L.LDL.C	rs148382396	1	54639713	A	-0.416	0.051	1.04E-15	0.0050	79.7
L.LDL.C	rs149048538	19	45053024	A	-0.310	0.044	2.45E-12	0.0030	57.7
L.LDL.C	rs149844719	1	54519237	T	-0.203	0.028	8.40E-13	0.0029	62.4
L.LDL.C	rs149944945	1	56129361	G	-0.298	0.034	8.05E-18	0.0044	85.5
L.LDL.C	rs150785555	1	56005603	A	-0.470	0.036	1.20E-38	0.0098	190.9
L.LDL.C	rs150966173	19	45421204	T	0.228	0.039	6.44E-09	0.0021	40.3
L.LDL.C	rs150985779	19	45147992	T	-0.284	0.038	1.53E-13	0.0034	66.0
L.LDL.C	rs151330717	19	45196964	A	-0.329	0.058	2.07E-08	0.0025	48.4
L.LDL.C	rs157594	19	45425175	G	0.138	0.012	3.63E-31	0.0092	179.3
L.LDL.C	rs17111503	1	55503448	G	0.077	0.013	6.09E-09	0.0019	41.4
L.LDL.C	rs180961170	1	57012269	G	-0.380	0.052	4.36E-13	0.0040	71.6
L.LDL.C	rs181169081	2	21312870	A	-0.192	0.032	2.83E-09	0.0021	41.2
L.LDL.C	rs181594442	1	57006537	A	-0.380	0.052	4.36E-13	0.0040	71.6
L.LDL.C	rs181847072	4	73134560	G	0.537	0.082	9.04E-11	0.0037	61.4
L.LDL.C	rs182300850	1	54389320	C	-0.401	0.060	4.12E-11	0.0038	56.6
L.LDL.C	rs183162020	4	73690263	G	0.722	0.115	6.81E-10	0.0060	59.6
L.LDL.C	rs183383492	19	11232974	C	-0.352	0.063	3.52E-08	0.0019	33.5
L.LDL.C	rs184229638	19	45671925	A	-0.688	0.115	3.24E-09	0.0042	50.6
L.LDL.C	rs184566992	19	44887996	T	-0.371	0.052	2.06E-12	0.0041	64.9
L.LDL.C	rs184650103	4	74850649	T	0.381	0.046	5.88E-16	0.0040	71.0
L.LDL.C	rs185049786	4	74644512	C	0.323	0.053	2.07E-09	0.0031	60.6
L.LDL.C	rs185415345	1	56625395	A	-0.171	0.027	6.61E-10	0.0026	50.1
L.LDL.C	rs185802315	19	10777054	G	-0.235	0.036	1.30E-10	0.0026	46.1
L.LDL.C	rs186538116	1	56840574	C	-0.441	0.045	2.06E-22	0.0065	116.1
L.LDL.C	rs188099946	19	45189605	T	-0.276	0.045	1.65E-09	0.0020	42.3
L.LDL.C	rs189409600	19	45341066	T	-0.746	0.103	1.00E-12	0.0059	82.8
L.LDL.C	rs189718275	19	45063850	A	-0.323	0.044	4.55E-13	0.0033	63.6
L.LDL.C	rs190217562	4	75180409	C	0.293	0.040	6.82E-13	0.0032	57.7
L.LDL.C	rs190934192	1	55334001	A	-0.399	0.040	7.10E-23	0.0075	144.8
L.LDL.C	rs191210370	1	54236244	G	-0.236	0.038	7.05E-10	0.0026	50.7
L.LDL.C	rs191404723	1	54636232	T	-0.415	0.051	9.32E-16	0.0046	80.4
L.LDL.C	rs191448950	1	55584844	A	-0.498	0.032	1.03E-54	0.0119	258.4
L.LDL.C	rs192012905	19	44463485	G	-0.362	0.053	1.19E-11	0.0033	59.4
L.LDL.C	rs192570155	1	55246601	C	-0.511	0.045	3.38E-29	0.0092	164.7
L.LDL.C	rs193084249	1	26987646	G	0.180	0.031	1.48E-08	0.0020	38.8
L.LDL.C	rs2007708	19	45410420	A	-0.852	0.104	6.39E-16	0.0057	104.5
L.LDL.C	rs207176	1	55791846	T	0.125	0.017	4.57E-13	0.0027	58.7

L.LDL.C	rs2207132	20	39142516	A	0.142	0.025	1.13E-08	0.0023	43.8
L.LDL.C	rs261334	15	58726744	C	-0.070	0.012	6.63E-09	0.0017	37.2
L.LDL.C	rs2722641	19	44892775	A	-0.262	0.044	5.32E-09	0.0029	52.2
L.LDL.C	rs2954022	8	126482621	A	-0.058	0.010	6.03E-09	0.0017	36.1
L.LDL.C	rs2965149	19	45190766	C	-0.068	0.011	1.82E-10	0.0022	47.3
L.LDL.C	rs2967668	19	45302951	G	-0.187	0.017	1.28E-27	0.0078	151.7
L.LDL.C	rs312030	2	21462743	C	0.101	0.018	1.72E-08	0.0017	36.0
L.LDL.C	rs34042070	16	72101525	G	0.069	0.012	2.68E-08	0.0015	33.1
L.LDL.C	rs34722314	2	21271707	A	-0.138	0.014	1.22E-21	0.0046	98.5
L.LDL.C	rs3741298	11	116657561	T	-0.069	0.012	8.86E-09	0.0016	35.4
L.LDL.C	rs3935470	5	74352180	G	0.058	0.011	4.76E-08	0.0015	32.7
L.LDL.C	rs404935	19	45372794	A	-0.157	0.017	2.82E-19	0.0044	94.4
L.LDL.C	rs429358	19	45411941	C	0.208	0.013	2.54E-53	0.0122	266.6
L.LDL.C	rs4426495	2	21143982	T	-0.064	0.010	3.82E-10	0.0019	41.4
L.LDL.C	rs4609471	1	55493584	A	-0.401	0.030	1.78E-40	0.0125	243.3
L.LDL.C	rs4803748	19	45247048	T	-0.080	0.011	1.64E-13	0.0030	64.9
L.LDL.C	rs4804573	19	11277232	A	-0.057	0.010	2.60E-08	0.0016	35.3
L.LDL.C	rs495828	9	136154867	T	0.072	0.012	1.61E-09	0.0018	38.5
L.LDL.C	rs58446550	19	45328380	A	0.070	0.011	9.41E-11	0.0022	48.4
L.LDL.C	rs58996925	1	56267033	G	-0.062	0.011	2.38E-08	0.0016	34.0
L.LDL.C	rs61770425	1	55085125	G	-0.083	0.012	1.26E-11	0.0023	50.1
L.LDL.C	rs62117161	19	45233385	G	-0.217	0.020	5.38E-27	0.0060	130.5
L.LDL.C	rs62120794	2	21100426	T	-0.185	0.024	3.51E-14	0.0031	62.1
L.LDL.C	rs629301	1	109818306	T	0.128	0.012	4.36E-26	0.0056	121.6
L.LDL.C	rs6511721	19	11206575	A	-0.091	0.011	1.76E-16	0.0041	88.9
L.LDL.C	rs6663252	1	55630151	C	-0.087	0.012	2.33E-12	0.0025	54.2
L.LDL.C	rs6756629	2	44065090	A	-0.141	0.018	2.03E-14	0.0029	62.2
L.LDL.C	rs6859	19	45382034	G	-0.079	0.010	2.22E-15	0.0031	67.6
L.LDL.C	rs7255743	19	46018119	A	-0.183	0.032	1.93E-08	0.0017	36.8
L.LDL.C	rs73048351	19	45160086	A	-0.419	0.064	1.57E-10	0.0031	59.4
L.LDL.C	rs73066442	7	21592973	G	0.073	0.011	2.90E-10	0.0020	43.0
L.LDL.C	rs73556990	19	44888175	G	-0.346	0.052	8.47E-11	0.0040	56.9
L.LDL.C	rs73564218	19	45665952	C	0.167	0.030	4.33E-08	0.0018	32.8
L.LDL.C	rs74073060	1	55638930	A	-0.496	0.037	2.63E-39	0.0105	204.6
L.LDL.C	rs7412	19	45412079	T	-0.573	0.025	#######	0.0347	657.1
L.LDL.C	rs75647206	1	56947591	T	-0.382	0.050	4.90E-14	0.0038	74.1
L.LDL.C	rs7604788	2	21190024	T	-0.183	0.022	2.55E-16	0.0036	77.8
L.LDL.C	rs76488675	1	56885874	G	-0.134	0.024	2.5E-08	0.0020	38.9
L.LDL.C	rs76670936	19	45196581	A	-0.144	0.018	1.9E-14	0.0034	73.1
L.LDL.C	rs77021821	4	75684215	T	0.242	0.040	3.3E-09	0.0021	40.7
L.LDL.C	rs79225634	5	74619639	T	0.086	0.010	4.4E-16	0.0033	72.0
L.LDL.C	rs79668907	19	11257169	T	-0.092	0.012	4E-13	0.0031	67.8
L.LDL.C	rs79890446	19	45723446	T	-0.248	0.033	1.5E-13	0.0038	73.4
L.LDL.C	rs8106814	19	45441608	C	-0.103	0.014	1.6E-12	0.0037	70.9
L.LDL.C	rs8111962	19	10915324	T	-0.102	0.014	4E-13	0.0027	57.4
L.LDL.C	rs934197	2	21267461	A	0.114	0.011	1.7E-24	0.0053	114.8
L.LDL.C	rs9749236	19	45524553	C	-0.441	0.075	8.4E-09	0.0024	45.2
L.LDL.C	rs984976	5	74910870	G	0.071	0.010	1.5E-12	0.0025	53.8
M.HDL.C	rs117040820	16	57005762	T	0.320	0.052	1.1E-09	0.0027	52.4
M.HDL.C	rs1800777	16	57017319	A	-0.233	0.035	5.1E-11	0.0026	50.8
M.HDL.C	rs2126259	8	9185146	C	0.094	0.014	1.4E-10	0.0020	43.1
M.HDL.C	rs247617	16	56990716	A	0.165	0.011	7.6E-52	0.0114	249.2
M.HDL.C	rs286	8	19815256	T	0.124	0.021	4.2E-09	0.0018	39.2

M.HDL.C	rs28888131	16	56991624	A	-0.123	0.013	1.3E-19	0.0042	91.9
M.HDL.C	rs289743	16	57017796	A	-0.060	0.010	1.1E-08	0.0016	34.7
M.HDL.C	rs34932218	8	19855661	G	0.064	0.011	1.2E-08	0.0016	34.2
M.HDL.C	rs429358	19	45411941	C	-0.083	0.013	7.3E-10	0.0020	42.3
M.HDL.C	rs4939883	18	47167214	C	0.073	0.013	2.3E-08	0.0015	32.4
M.HDL.C	rs590820	1	230309619	G	-0.058	0.010	1.7E-08	0.0016	35.3
M.HDL.C	rs7499892	16	57006590	T	-0.171	0.013	1.5E-38	0.0085	184.0
M.HDL.C	rs75835816	8	19885513	C	-0.238	0.038	6.3E-10	0.0022	41.6
IDL.C	rs10424477	19	10636051	T	-0.083	0.012	5.1E-12	0.0029	56.7
IDL.C	rs10449300	1	109381904	G	-0.066	0.011	6E-09	0.0019	37.2
IDL.C	rs111740198	19	44878217	A	-0.327	0.052	6.2E-10	0.0034	50.1
IDL.C	rs114664261	2	21410015	T	0.259	0.047	4.1E-08	0.0026	50.8
IDL.C	rs11579068	1	55780213	C	-0.106	0.014	9.1E-14	0.0030	57.6
IDL.C	rs116054287	1	56401689	C	-0.400	0.038	1.1E-24	0.0062	120.8
IDL.C	rs117261169	19	45491032	T	-0.367	0.055	6.9E-11	0.0026	50.3
IDL.C	rs11748027	5	74909972	T	0.072	0.010	6.2E-12	0.0026	49.6
IDL.C	rs117569256	19	45423330	G	-0.780	0.107	7.2E-13	0.0061	82.9
IDL.C	rs11878174	19	45723379	C	0.076	0.012	1.3E-10	0.0028	55.0
IDL.C	rs12043403	1	55431933	C	-0.132	0.018	4.5E-13	0.0035	67.1
IDL.C	rs12086676	1	55738663	T	-0.084	0.013	1.8E-10	0.0022	43.2
IDL.C	rs137992968	19	11239696	T	-0.228	0.035	1.3E-10	0.0023	44.4
IDL.C	rs138287365	4	74781004	C	0.305	0.049	1E-09	0.0025	47.8
IDL.C	rs138525976	1	55960656	A	-0.115	0.019	1.6E-09	0.0021	40.7
IDL.C	rs142130958	19	11190652	A	-0.238	0.017	4.2E-42	0.0103	201.3
IDL.C	rs143413051	4	75560225	T	0.313	0.055	1.7E-08	0.0022	40.0
IDL.C	rs144545816	2	21413077	A	0.093	0.012	1.7E-14	0.0033	63.1
IDL.C	rs144721118	1	54196340	A	-0.297	0.040	1.8E-13	0.0040	78.2
IDL.C	rs144900553	19	10798974	T	-0.346	0.053	1.6E-10	0.0030	58.5
IDL.C	rs146568567	1	54824117	A	-0.328	0.032	1.7E-24	0.0059	114.2
IDL.C	rs148359521	2	21414212	T	-0.203	0.032	4E-10	0.0024	46.0
IDL.C	rs148382396	1	54639713	A	-0.419	0.051	6.7E-16	0.0051	80.8
IDL.C	rs149048538	19	45053024	A	-0.311	0.044	2.2E-12	0.0030	58.0
IDL.C	rs149844719	1	54519237	T	-0.207	0.028	4.6E-13	0.0032	62.4
IDL.C	rs149944945	1	56129361	G	-0.289	0.034	7.9E-17	0.0042	80.5
IDL.C	rs150966173	19	45421204	T	0.221	0.039	1.9E-08	0.0020	37.9
IDL.C	rs150985779	19	45147992	T	-0.271	0.038	1.8E-12	0.0031	60.1
IDL.C	rs151193598	4	73303394	A	0.507	0.085	4.8E-09	0.0039	55.7
IDL.C	rs1532085	15	58683366	G	-0.091	0.011	2.1E-17	0.0040	76.5
IDL.C	rs157594	19	45425175	G	0.136	0.012	3.7E-30	0.0089	173.3
IDL.C	rs16940213	15	58695337	T	0.080	0.013	4.7E-09	0.0018	35.7
IDL.C	rs180961170	1	57012269	G	-0.375	0.052	9.5E-13	0.0039	69.6
IDL.C	rs181169081	2	21312870	A	-0.202	0.032	4E-10	0.0024	45.7
IDL.C	rs181594442	1	57006537	A	-0.375	0.052	9.4E-13	0.0039	69.6
IDL.C	rs182300850	1	54389320	C	-0.419	0.060	5.6E-12	0.0041	61.7
IDL.C	rs182896710	19	10962613	T	-0.182	0.032	2.5E-08	0.0021	40.7
IDL.C	rs183162020	4	73690263	G	0.651	0.115	2.8E-08	0.0049	48.4
IDL.C	rs183305631	19	19597444	A	-0.186	0.032	1E-08	0.0024	42.6
IDL.C	rs183383492	19	11232974	C	-0.362	0.063	1.5E-08	0.0020	35.5
IDL.C	rs184229638	19	45671925	A	-0.663	0.115	1.2E-08	0.0038	46.9
IDL.C	rs184566992	19	44887996	T	-0.353	0.052	2.4E-11	0.0037	58.7
IDL.C	rs184650103	4	74850649	T	0.327	0.046	3.8E-12	0.0029	52.4
IDL.C	rs185415345	1	56625395	A	-0.164	0.027	3.2E-09	0.0024	46.2
IDL.C	rs186538116	1	56840574	C	-0.439	0.045	3E-22	0.0064	115.3

IDL.C	rs188026950	1	55939497	A	-0.463	0.036	9.3E-38	0.0096	186.5
IDL.C	rs1883711	20	39179822	C	0.149	0.025	3E-09	0.0024	45.7
IDL.C	rs189409600	19	45341066	T	-0.650	0.103	5.3E-10	0.0045	62.8
IDL.C	rs189524519	19	11002852	G	-0.263	0.041	2.7E-10	0.0026	47.1
IDL.C	rs189718275	19	45063850	A	-0.322	0.044	5.5E-13	0.0033	63.2
IDL.C	rs190121281	19	19252779	A	-0.197	0.033	2.8E-09	0.0026	46.4
IDL.C	rs190217562	4	75180409	C	0.254	0.040	5.1E-10	0.0024	43.3
IDL.C	rs190425759	19	10644246	A	-0.219	0.035	1.1E-09	0.0022	41.6
IDL.C	rs190934192	1	55334001	A	-0.388	0.040	1.2E-21	0.0070	136.7
IDL.C	rs191210370	1	54236244	G	-0.250	0.038	6.5E-11	0.0029	56.9
IDL.C	rs191404723	1	54636232	T	-0.416	0.051	8.9E-16	0.0046	80.5
IDL.C	rs191448950	1	55584844	A	-0.484	0.032	2.1E-51	0.0123	240.3
IDL.C	rs192012905	19	44463485	G	-0.347	0.053	8.1E-11	0.0031	54.6
IDL.C	rs192570155	1	55246601	C	-0.500	0.045	5.2E-28	0.0088	158.0
IDL.C	rs2007708	19	45410420	A	-0.751	0.104	1.1E-12	0.0044	80.9
IDL.C	rs2287029	19	10916684	T	-0.109	0.015	2.2E-13	0.0029	56.6
IDL.C	rs2479410	1	55505861	A	-0.081	0.012	8.1E-11	0.0026	50.3
IDL.C	rs261334	15	58726744	C	-0.119	0.012	2E-21	0.0050	97.0
IDL.C	rs2722641	19	44892775	A	-0.253	0.044	2E-08	0.0027	48.4
IDL.C	rs2965149	19	45190766	C	-0.070	0.011	4.6E-10	0.0023	44.3
IDL.C	rs2967668	19	45302951	G	-0.172	0.017	1.4E-23	0.0066	128.2
IDL.C	rs2980860	8	126485337	G	-0.065	0.010	5.2E-10	0.0021	40.6
IDL.C	rs312030	2	21462743	C	0.106	0.018	8.7E-09	0.0019	36.0
IDL.C	rs35913552	2	21272896	A	-0.143	0.015	3.9E-21	0.0049	94.6
IDL.C	rs395908	19	45373565	A	-0.161	0.018	2.6E-18	0.0044	85.7
IDL.C	rs429358	19	45411941	C	0.183	0.014	5.9E-39	0.0094	182.2
IDL.C	rs4609471	1	55493584	A	-0.394	0.030	4.5E-39	0.0120	234.6
IDL.C	rs4803748	19	45247048	T	-0.071	0.011	2.4E-10	0.0024	45.7
IDL.C	rs4804573	19	11277232	A	-0.059	0.011	4.5E-08	0.0017	33.2
IDL.C	rs565436	1	55524601	A	0.089	0.012	3.8E-13	0.0029	56.4
IDL.C	rs58446550	19	45328380	A	0.065	0.011	2.9E-09	0.0020	38.0
IDL.C	rs61770425	1	55085125	G	-0.086	0.013	1.3E-11	0.0026	49.3
IDL.C	rs62117161	19	45233385	G	-0.195	0.021	6.2E-21	0.0049	95.3
IDL.C	rs62120794	2	21100426	T	-0.182	0.024	1.9E-13	0.0032	56.9
IDL.C	rs62523994	8	145026582	A	0.060	0.011	2.3E-08	0.0017	33.2
IDL.C	rs629301	1	109818306	T	0.127	0.012	7.5E-24	0.0055	105.7
IDL.C	rs635634	9	136155000	T	0.083	0.013	2.1E-10	0.0022	42.4
IDL.C	rs6511721	19	11206575	A	-0.086	0.011	1.9E-14	0.0037	71.9
IDL.C	rs6663252	1	55630151	C	-0.091	0.012	5E-13	0.0029	55.1
IDL.C	rs6732011	2	21146521	T	-0.074	0.011	3.6E-12	0.0026	50.3
IDL.C	rs6756629	2	44065090	A	-0.129	0.019	1.7E-11	0.0025	47.8
IDL.C	rs6859	19	45382034	G	-0.071	0.010	1.1E-11	0.0025	49.1
IDL.C	rs7255743	19	46018119	A	-0.181	0.033	4.6E-08	0.0018	34.2
IDL.C	rs72740818	15	58654303	C	0.058	0.010	4.4E-08	0.0017	32.0
IDL.C	rs73048351	19	45160086	A	-0.377	0.064	8.5E-09	0.0025	48.1
IDL.C	rs73556990	19	44888175	G	-0.329	0.052	6.4E-10	0.0036	51.6
IDL.C	rs74073060	1	55638930	A	-0.487	0.037	6.7E-38	0.0101	197.0
IDL.C	rs7412	19	45412079	T	-0.533	0.026	5.1E-92	0.0298	490.8
IDL.C	rs75647206	1	56947591	T	-0.379	0.050	7.9E-14	0.0038	72.9
IDL.C	rs7604788	2	21190024	T	-0.189	0.022	3.8E-17	0.0041	80.1
IDL.C	rs76488675	1	56885874	G	-0.147	0.024	1.1E-09	0.0024	46.6
IDL.C	rs76670936	19	45196581	A	-0.142	0.019	2.1E-13	0.0033	63.0
IDL.C	rs7786322	7	21592766	T	0.070	0.012	9E-09	0.0018	35.1

IDL.C	rs78620068	2	21524000	A	-0.131	0.019	4.7E-12	0.0027	52.3
IDL.C	rs79225634	5	74619639	T	0.090	0.011	2.5E-16	0.0037	71.5
IDL.C	rs79668907	19	11257169	T	-0.084	0.013	1.1E-10	0.0026	50.6
IDL.C	rs79890446	19	45723446	T	-0.238	0.033	1.3E-12	0.0035	67.8
IDL.C	rs8106814	19	45441608	C	-0.095	0.014	9.4E-11	0.0031	59.6
IDL.C	rs952275	2	21221399	G	0.109	0.010	3.6E-25	0.0058	112.4
XS.VLDL.TG	rs11076176	16	57007446	G	0.090	0.014	8.7E-10	0.0022	42.0
XS.VLDL.TG	rs11096689	2	21140540	T	-0.097	0.012	1.6E-16	0.0037	71.6
XS.VLDL.TG	rs113531395	17	4886829	T	-0.215	0.036	5.3E-09	0.0024	45.6
XS.VLDL.TG	rs115849089	8	19912370	A	-0.156	0.017	3.4E-19	0.0044	86.0
XS.VLDL.TG	rs116802199	17	4801101	C	-0.197	0.032	1.1E-09	0.0022	40.7
XS.VLDL.TG	rs1168041	1	62960250	C	0.094	0.012	4E-15	0.0035	67.2
XS.VLDL.TG	rs1260326	2	27730940	C	-0.081	0.011	6.6E-14	0.0030	58.8
XS.VLDL.TG	rs1268353	11	116639692	T	-0.081	0.011	2.5E-14	0.0031	60.7
XS.VLDL.TG	rs12747477	1	55448248	A	-0.219	0.033	9.9E-11	0.0027	52.5
XS.VLDL.TG	rs138287365	4	74781004	C	0.313	0.049	3.9E-10	0.0026	50.3
XS.VLDL.TG	rs143413051	4	75560225	T	0.308	0.055	2.9E-08	0.0022	38.8
XS.VLDL.TG	rs143736900	4	72871285	C	0.593	0.082	1.3E-12	0.0044	73.5
XS.VLDL.TG	rs146695330	19	20139610	A	-0.215	0.035	1.5E-09	0.0027	48.0
XS.VLDL.TG	rs150536132	19	19679560	T	-0.181	0.030	1.8E-09	0.0028	49.2
XS.VLDL.TG	rs150617279	19	20139234	A	-0.118	0.017	1.9E-11	0.0027	52.7
XS.VLDL.TG	rs150785555	1	56005603	A	-0.229	0.036	3.2E-10	0.0023	44.8
XS.VLDL.TG	rs151007118	11	116583864	T	0.221	0.033	8.6E-11	0.0025	48.6
XS.VLDL.TG	rs151193598	4	73303394	A	0.531	0.086	9.5E-10	0.0043	61.2
XS.VLDL.TG	rs157594	19	45425175	G	0.111	0.012	1.1E-20	0.0060	116.0
XS.VLDL.TG	rs17216525	19	19662220	T	-0.143	0.021	1.4E-11	0.0025	47.9
XS.VLDL.TG	rs174418	15	58687603	C	-0.088	0.010	1.5E-16	0.0038	73.1
XS.VLDL.TG	rs181169081	2	21312870	A	-0.213	0.032	5.1E-11	0.0026	50.5
XS.VLDL.TG	rs181847072	4	73134560	G	0.595	0.082	6.8E-13	0.0045	75.4
XS.VLDL.TG	rs183162020	4	73690263	G	0.711	0.116	1.5E-09	0.0059	57.8
XS.VLDL.TG	rs183305631	19	19597444	A	-0.212	0.032	6.1E-11	0.0031	55.7
XS.VLDL.TG	rs1838504	15	58666410	T	0.069	0.010	7E-11	0.0024	46.3
XS.VLDL.TG	rs184650103	4	74850649	T	0.340	0.046	5.7E-13	0.0032	56.5
XS.VLDL.TG	rs1848922	2	21471603	C	0.093	0.013	4E-13	0.0029	56.6
XS.VLDL.TG	rs1883711	20	39179822	C	0.149	0.025	3.3E-09	0.0024	45.6
XS.VLDL.TG	rs188651594	11	116673091	A	0.267	0.042	5.5E-10	0.0025	45.2
XS.VLDL.TG	rs189741280	19	19624481	G	-0.188	0.030	5.5E-10	0.0026	50.2
XS.VLDL.TG	rs190121281	19	19252779	A	-0.210	0.033	2.3E-10	0.0030	53.0
XS.VLDL.TG	rs190217562	4	75180409	C	0.251	0.040	7.5E-10	0.0024	42.5
XS.VLDL.TG	rs191164477	2	21267593	T	-0.212	0.032	3.8E-11	0.0026	51.0
XS.VLDL.TG	rs193260502	11	116611138	A	0.216	0.038	2.6E-08	0.0023	44.1
XS.VLDL.TG	rs247617	16	56990716	A	-0.116	0.011	2.2E-23	0.0055	106.9
XS.VLDL.TG	rs261334	15	58726744	C	-0.118	0.012	2.9E-21	0.0050	96.3
XS.VLDL.TG	rs2878419	5	74640490	T	0.061	0.010	9E-09	0.0018	35.0
XS.VLDL.TG	rs2954029	8	126490972	T	-0.086	0.010	2.8E-16	0.0037	70.6
XS.VLDL.TG	rs34041051	19	45442349	C	0.067	0.011	8.9E-09	0.0021	39.7
XS.VLDL.TG	rs34346326	7	73016181	C	-0.076	0.014	3.6E-08	0.0017	31.9
XS.VLDL.TG	rs429358	19	45411941	C	0.108	0.014	1.7E-14	0.0033	63.1
XS.VLDL.TG	rs4609471	1	55493584	A	-0.173	0.030	1E-08	0.0023	45.0
XS.VLDL.TG	rs58542926	19	19379549	T	-0.153	0.021	7.9E-13	0.0028	53.6
XS.VLDL.TG	rs62123892	2	21084445	T	-0.090	0.016	2.2E-08	0.0018	33.9
XS.VLDL.TG	rs6511720	19	11202306	T	-0.145	0.017	1.9E-16	0.0038	73.1
XS.VLDL.TG	rs6511721	19	11206575	A	-0.064	0.011	1.4E-08	0.0020	39.5

XS.VLDL.TG	rs6544366	2	21204025	T	-0.121	0.011	2.9E-25	0.0058	112.3
XS.VLDL.TG	rs7115242	11	116908283	G	-0.125	0.016	5E-15	0.0034	66.7
XS.VLDL.TG	rs72660594	1	55636240	C	-0.201	0.029	7.2E-12	0.0027	52.9
XS.VLDL.TG	rs74073060	1	55638930	A	-0.229	0.037	1.8E-09	0.0022	43.2
XS.VLDL.TG	rs77182215	11	116942366	A	0.165	0.029	1.6E-08	0.0019	37.6
XS.VLDL.TG	rs79202680	17	4692640	T	-0.217	0.035	7.9E-10	0.0023	44.9
XS.VLDL.TG	rs964184	11	116648917	C	-0.216	0.015	9.4E-49	0.0114	222.7
S.VLDL.TG	rs10401845	19	11191536	C	-0.078	0.013	5.2E-09	0.0018	38.2
S.VLDL.TG	rs1042034	2	21225281	T	0.105	0.011	1.3E-20	0.0042	91.0
S.VLDL.TG	rs111648015	8	19724434	T	-0.168	0.030	3.3E-08	0.0018	38.3
S.VLDL.TG	rs112030397	19	8582383	G	-0.082	0.014	8.4E-09	0.0017	35.8
S.VLDL.TG	rs113560866	11	117015189	C	0.082	0.014	1.3E-08	0.0017	37.5
S.VLDL.TG	rs115849089	8	19912370	A	-0.176	0.017	1.6E-25	0.0059	129.0
S.VLDL.TG	rs1168041	1	62960250	C	0.086	0.011	3.8E-14	0.0030	64.1
S.VLDL.TG	rs116843064	19	8429323	A	-0.211	0.035	2.5E-09	0.0025	48.9
S.VLDL.TG	rs117001569	8	19574920	G	-0.232	0.041	2.6E-08	0.0017	33.7
S.VLDL.TG	rs1240659	11	116493950	G	0.071	0.013	4.5E-08	0.0016	34.2
S.VLDL.TG	rs1260326	2	27730940	C	-0.099	0.010	6.2E-22	0.0046	98.8
S.VLDL.TG	rs1268353	11	116639692	T	-0.085	0.010	5.1E-17	0.0034	74.0
S.VLDL.TG	rs12997242	2	21381177	A	0.062	0.010	2.7E-09	0.0017	37.7
S.VLDL.TG	rs145106713	8	19942183	T	-0.257	0.042	2.3E-09	0.0020	38.8
S.VLDL.TG	rs150617279	19	20139234	A	-0.106	0.017	1.3E-09	0.0022	42.8
S.VLDL.TG	rs151007118	11	116583864	T	0.268	0.033	2.5E-15	0.0037	71.6
S.VLDL.TG	rs17216525	19	19662220	T	-0.137	0.020	1E-11	0.0023	49.5
S.VLDL.TG	rs188651594	11	116673091	A	0.312	0.042	3.1E-13	0.0035	61.8
S.VLDL.TG	rs2980853	8	126478350	C	-0.072	0.010	4.1E-13	0.0026	56.3
S.VLDL.TG	rs34346326	7	73016181	C	-0.113	0.014	1.1E-14	0.0031	67.0
S.VLDL.TG	rs36229786	16	56993901	C	0.086	0.014	1.3E-09	0.0020	43.0
S.VLDL.TG	rs3826688	19	45418961	C	0.090	0.011	1.4E-15	0.0035	76.5
S.VLDL.TG	rs429358	19	45411941	C	0.106	0.013	5.8E-15	0.0032	68.6
S.VLDL.TG	rs4341893	2	21135577	G	-0.066	0.010	4.7E-10	0.0019	41.1
S.VLDL.TG	rs5167	19	45448465	G	0.058	0.010	3.8E-08	0.0016	31.8
S.VLDL.TG	rs579674	11	116528224	G	0.081	0.013	2.8E-10	0.0020	43.7
S.VLDL.TG	rs6065904	20	44534651	A	0.076	0.012	1.6E-10	0.0020	43.8
S.VLDL.TG	rs61905067	11	116578982	G	0.235	0.039	2E-09	0.0021	45.5
S.VLDL.TG	rs7115242	11	116908283	G	-0.127	0.016	8.8E-16	0.0033	71.9
S.VLDL.TG	rs72836561	17	41926126	T	0.215	0.036	3.1E-09	0.0023	43.5
S.VLDL.TG	rs72999033	19	19366632	T	-0.155	0.021	3.4E-13	0.0027	57.8
S.VLDL.TG	rs77182215	11	116942366	A	0.205	0.029	1.6E-12	0.0030	58.3
S.VLDL.TG	rs7826306	8	19900671	C	-0.064	0.010	1.4E-09	0.0018	39.1
S.VLDL.TG	rs821840	16	56993886	G	-0.109	0.012	3.1E-20	0.0046	99.1
S.VLDL.TG	rs9472125	6	43756169	T	-0.095	0.016	5.6E-09	0.0025	48.6
S.VLDL.TG	rs964184	11	116648917	C	-0.242	0.014	7.6E-66	0.0140	305.7
S.VLDL.C	rs1042034	2	21225281	T	0.107	0.011	2.1E-21	0.0044	94.6
S.VLDL.C	rs115849089	8	19912370	A	-0.125	0.017	1.6E-13	0.0030	64.4
S.VLDL.C	rs11591147	1	55505647	T	-0.338	0.035	1E-21	0.0068	109.3
S.VLDL.C	rs116054287	1	56401689	C	-0.242	0.038	2.7E-10	0.0022	46.6
S.VLDL.C	rs1168041	1	62960250	C	0.076	0.011	1.9E-11	0.0023	50.4
S.VLDL.C	rs118146573	16	57000938	A	0.120	0.017	2.5E-12	0.0025	53.9
S.VLDL.C	rs11881315	19	10909953	T	-0.074	0.013	1.2E-08	0.0016	35.1
S.VLDL.C	rs1260326	2	27730940	C	-0.074	0.010	7.6E-13	0.0025	54.5
S.VLDL.C	rs1268353	11	116639692	T	-0.066	0.010	5.4E-11	0.0021	45.2
S.VLDL.C	rs1367117	2	21263900	A	0.098	0.011	1E-18	0.0040	85.5

S.VLDL.C	rs138287365	4	74781004	C	0.301	0.049	1.5E-09	0.0024	46.5
S.VLDL.C	rs140339333	4	75396456	A	0.259	0.044	5.8E-09	0.0024	46.3
S.VLDL.C	rs142130958	19	11190652	A	-0.173	0.016	2.4E-25	0.0056	122.0
S.VLDL.C	rs143413051	4	75560225	T	0.345	0.055	4.3E-10	0.0027	48.6
S.VLDL.C	rs143736900	4	72871285	C	0.520	0.082	4.3E-10	0.0034	56.4
S.VLDL.C	rs146568567	1	54824117	A	-0.221	0.032	5.8E-12	0.0027	51.5
S.VLDL.C	rs150103689	1	56105434	G	-0.327	0.044	1.5E-13	0.0036	63.7
S.VLDL.C	rs150617279	19	20139234	A	-0.107	0.017	8.5E-10	0.0023	43.6
S.VLDL.C	rs151007118	11	116583864	T	0.214	0.033	2.4E-10	0.0024	45.8
S.VLDL.C	rs151193598	4	73303394	A	0.528	0.085	9.5E-10	0.0043	60.4
S.VLDL.C	rs157594	19	45425175	G	0.102	0.012	1.1E-17	0.0050	96.9
S.VLDL.C	rs17216525	19	19662220	T	-0.131	0.020	7.3E-11	0.0021	45.3
S.VLDL.C	rs17414716	1	55759138	G	-0.281	0.033	1.4E-17	0.0038	82.6
S.VLDL.C	rs181847072	4	73134560	G	0.522	0.082	2.6E-10	0.0035	57.9
S.VLDL.C	rs183162020	4	73690263	G	0.682	0.115	5.2E-09	0.0054	53.1
S.VLDL.C	rs183305631	19	19597444	A	-0.184	0.032	1.3E-08	0.0023	41.7
S.VLDL.C	rs184650103	4	74850649	T	0.346	0.046	1.6E-13	0.0033	58.6
S.VLDL.C	rs188357577	4	75417188	G	0.335	0.051	9.4E-11	0.0026	50.8
S.VLDL.C	rs188651594	11	116673091	A	0.254	0.042	3.1E-09	0.0023	40.8
S.VLDL.C	rs190934192	1	55334001	A	-0.250	0.040	6.7E-10	0.0029	56.5
S.VLDL.C	rs192570155	1	55246601	C	-0.325	0.045	9.3E-13	0.0037	66.4
S.VLDL.C	rs2980875	8	126481747	G	-0.067	0.010	1.8E-11	0.0022	47.9
S.VLDL.C	rs3005923	1	56801542	A	-0.222	0.036	1.5E-09	0.0026	50.9
S.VLDL.C	rs312030	2	21462743	C	0.110	0.018	5.4E-10	0.0020	43.4
S.VLDL.C	rs3764261	16	56993324	A	-0.103	0.011	4E-21	0.0044	95.4
S.VLDL.C	rs429358	19	45411941	C	0.138	0.013	2.2E-24	0.0054	116.6
S.VLDL.C	rs4609471	1	55493584	A	-0.251	0.030	8.4E-17	0.0049	94.3
S.VLDL.C	rs562338	2	21288321	G	0.083	0.013	9.7E-11	0.0021	44.8
S.VLDL.C	rs61905067	11	116578982	G	0.222	0.039	1.5E-08	0.0019	40.6
S.VLDL.C	rs62123892	2	21084445	T	-0.092	0.015	4.6E-09	0.0018	37.9
S.VLDL.C	rs646776	1	109818530	T	0.070	0.012	5.6E-09	0.0017	36.8
S.VLDL.C	rs6511721	19	11206575	A	-0.068	0.011	5.3E-10	0.0023	50.2
S.VLDL.C	rs6720307	2	20921334	C	-0.061	0.010	2.9E-09	0.0018	38.1
S.VLDL.C	rs7115242	11	116908283	G	-0.103	0.016	6.2E-11	0.0022	47.5
S.VLDL.C	rs72999033	19	19366632	T	-0.147	0.021	4.8E-12	0.0024	52.1
S.VLDL.C	rs74073060	1	55638930	A	-0.308	0.037	4E-16	0.0040	78.3
S.VLDL.C	rs7412	19	45412079	T	-0.235	0.025	6.6E-20	0.0058	107.2
S.VLDL.C	rs77021821	4	75684215	T	0.231	0.040	1.5E-08	0.0019	37.0
S.VLDL.C	rs79225634	5	74619639	T	0.078	0.010	1.7E-13	0.0027	58.9
S.VLDL.C	rs964184	11	116648917	C	-0.188	0.014	2.3E-40	0.0084	183.7
S.VLDL.C	rs984976	5	74910870	G	0.071	0.010	1.4E-12	0.0025	53.7
M.VLDL.TG	rs1168001	1	62933758	A	0.072	0.011	2.6E-11	0.0022	46.5
M.VLDL.TG	rs116843064	19	8429323	A	-0.210	0.035	3.4E-09	0.0025	47.5
M.VLDL.TG	rs1260326	2	27730940	C	-0.095	0.010	6.8E-20	0.0041	88.1
M.VLDL.TG	rs1268353	11	116639692	T	-0.079	0.010	1E-14	0.0029	62.4
M.VLDL.TG	rs149611002	8	19986935	T	-0.248	0.042	6.4E-09	0.0022	42.0
M.VLDL.TG	rs150617279	19	20139234	A	-0.096	0.017	4.1E-08	0.0018	34.6
M.VLDL.TG	rs151007118	11	116583864	T	0.246	0.034	4.7E-13	0.0031	59.2
M.VLDL.TG	rs17120347	11	116996539	A	0.091	0.015	7.4E-10	0.0019	40.5
M.VLDL.TG	rs17216525	19	19662220	T	-0.120	0.020	2.6E-09	0.0018	37.5
M.VLDL.TG	rs188632579	11	116611098	C	0.256	0.046	3.7E-08	0.0017	33.6
M.VLDL.TG	rs188651594	11	116673091	A	0.277	0.043	1.2E-10	0.0027	47.6
M.VLDL.TG	rs34121855	7	73040814	G	-0.117	0.013	2E-18	0.0039	83.4

M.VLDL.TG	rs42121	7	72842267	T	-0.107	0.018	7.7E-09	0.0024	45.3
M.VLDL.TG	rs439401	19	45414451	C	0.080	0.011	1.2E-12	0.0027	57.8
M.VLDL.TG	rs579674	11	116528224	G	0.081	0.013	3.6E-10	0.0020	42.7
M.VLDL.TG	rs59007384	19	45396665	T	0.069	0.012	1.2E-08	0.0017	36.2
M.VLDL.TG	rs6065904	20	44534651	A	0.077	0.012	9.1E-11	0.0021	44.5
M.VLDL.TG	rs61905067	11	116578982	G	0.222	0.039	1.7E-08	0.0019	40.0
M.VLDL.TG	rs6586886	8	19875408	A	-0.058	0.010	2.4E-08	0.0016	33.1
M.VLDL.TG	rs673548	2	21237544	A	-0.080	0.011	2.4E-12	0.0024	51.1
M.VLDL.TG	rs7115242	11	116908283	G	-0.114	0.016	4.1E-13	0.0027	57.8
M.VLDL.TG	rs72999033	19	19366632	T	-0.138	0.021	9E-11	0.0021	45.4
M.VLDL.TG	rs77182215	11	116942366	A	0.205	0.029	2.4E-12	0.0030	56.7
M.VLDL.TG	rs77697917	17	41840849	T	0.209	0.037	2.8E-08	0.0020	37.7
M.VLDL.TG	rs79236614	8	19860460	G	-0.166	0.017	1.6E-21	0.0045	96.2
M.VLDL.TG	rs821840	16	56993886	G	-0.070	0.012	3.3E-09	0.0019	40.4
M.VLDL.TG	rs9472125	6	43756169	T	-0.091	0.016	2.6E-08	0.0023	43.9
M.VLDL.TG	rs964184	11	116648917	C	-0.228	0.014	2.4E-58	0.0124	266.9
S.LDL.C	rs10180633	2	21144829	T	-0.065	0.010	1.6E-10	0.0020	42.8
S.LDL.C	rs10402524	19	45329344	C	0.065	0.010	1.1E-09	0.0019	41.6
S.LDL.C	rs10424477	19	10636051	T	-0.072	0.011	5E-10	0.0023	48.9
S.LDL.C	rs111740198	19	44878217	A	-0.293	0.052	2.8E-08	0.0028	40.1
S.LDL.C	rs112635299	14	94838142	T	0.249	0.040	6.6E-10	0.0021	43.1
S.LDL.C	rs116054287	1	56401689	C	-0.364	0.038	1.9E-21	0.0049	105.8
S.LDL.C	rs117261169	19	45491032	T	-0.320	0.055	1.2E-08	0.0020	38.2
S.LDL.C	rs117569256	19	45423330	G	-0.734	0.107	1.3E-11	0.0054	73.3
S.LDL.C	rs11878174	19	45723379	C	0.070	0.012	3.2E-09	0.0024	46.4
S.LDL.C	rs12043403	1	55431933	C	-0.131	0.018	5.5E-13	0.0034	66.3
S.LDL.C	rs12086676	1	55738663	T	-0.071	0.013	3E-08	0.0015	33.4
S.LDL.C	rs1260326	2	27730940	C	-0.061	0.010	4.3E-09	0.0017	36.7
S.LDL.C	rs137992968	19	11239696	T	-0.195	0.034	1.3E-08	0.0017	36.0
S.LDL.C	rs138270540	4	75353427	C	0.219	0.036	1.8E-09	0.0023	44.6
S.LDL.C	rs138287365	4	74781004	C	0.357	0.049	7.9E-13	0.0034	65.4
S.LDL.C	rs140339333	4	75396456	A	0.260	0.044	5.4E-09	0.0024	46.5
S.LDL.C	rs140411770	19	45356517	A	-0.527	0.088	4E-09	0.0046	72.0
S.LDL.C	rs142130958	19	11190652	A	-0.207	0.016	7.8E-36	0.0081	175.8
S.LDL.C	rs143413051	4	75560225	T	0.364	0.055	4.7E-11	0.0030	54.1
S.LDL.C	rs143736900	4	72871285	C	0.584	0.082	2.5E-12	0.0043	71.1
S.LDL.C	rs144064722	4	73406173	G	0.252	0.034	2.5E-13	0.0031	60.6
S.LDL.C	rs144721118	1	54196340	A	-0.249	0.040	5.4E-10	0.0029	55.2
S.LDL.C	rs146568567	1	54824117	A	-0.288	0.032	2.6E-19	0.0045	87.8
S.LDL.C	rs146982841	19	10771544	T	-0.223	0.036	9.4E-10	0.0023	41.6
S.LDL.C	rs147825223	19	45479553	C	0.165	0.028	1E-08	0.0020	36.0
S.LDL.C	rs148359521	2	21414212	T	-0.180	0.032	2.9E-08	0.0019	36.0
S.LDL.C	rs148382396	1	54639713	A	-0.364	0.051	1.9E-12	0.0038	61.1
S.LDL.C	rs149048538	19	45053024	A	-0.242	0.044	4.5E-08	0.0018	35.0
S.LDL.C	rs149844719	1	54519237	T	-0.172	0.028	1.2E-09	0.0021	44.9
S.LDL.C	rs149944945	1	56129361	G	-0.286	0.034	1.3E-16	0.0041	78.7
S.LDL.C	rs150785555	1	56005603	A	-0.435	0.036	1.9E-33	0.0084	163.3
S.LDL.C	rs150966173	19	45421204	T	0.222	0.039	1.5E-08	0.0020	38.2
S.LDL.C	rs150985779	19	45147992	T	-0.245	0.038	1.9E-10	0.0025	48.8
S.LDL.C	rs157594	19	45425175	G	0.130	0.012	6.3E-28	0.0082	158.9
S.LDL.C	rs17111503	1	55503448	G	0.072	0.013	4.3E-08	0.0017	36.6
S.LDL.C	rs17395160	1	55085141	G	-0.081	0.012	3.5E-11	0.0022	47.3
S.LDL.C	rs180961170	1	57012269	G	-0.349	0.052	2.9E-11	0.0034	60.1

S.LDL.C	rs181169081	2	21312870	A	-0.178	0.032	3.5E-08	0.0018	35.3
S.LDL.C	rs181594442	1	57006537	A	-0.348	0.052	3E-11	0.0034	60.0
S.LDL.C	rs181847072	4	73134560	G	0.581	0.082	2.1E-12	0.0043	71.8
S.LDL.C	rs182300850	1	54389320	C	-0.350	0.060	7.7E-09	0.0029	43.1
S.LDL.C	rs182318839	19	45747128	T	0.298	0.054	4E-08	0.0027	46.8
S.LDL.C	rs183162020	4	73690263	G	0.760	0.115	7E-11	0.0067	66.2
S.LDL.C	rs184566992	19	44887996	T	-0.318	0.052	1.5E-09	0.0030	47.7
S.LDL.C	rs184650103	4	74850649	T	0.396	0.046	3.5E-17	0.0043	76.6
S.LDL.C	rs185049786	4	74644512	C	0.336	0.053	3.9E-10	0.0034	65.8
S.LDL.C	rs185415345	1	56625395	A	-0.159	0.027	8.5E-09	0.0022	43.4
S.LDL.C	rs186538116	1	56840574	C	-0.405	0.045	3.2E-19	0.0055	97.8
S.LDL.C	rs189409600	19	45341066	T	-0.713	0.103	8.8E-12	0.0054	75.6
S.LDL.C	rs189718275	19	45063850	A	-0.256	0.044	9.3E-09	0.0021	39.8
S.LDL.C	rs190217562	4	75180409	C	0.300	0.040	1.7E-13	0.0034	60.4
S.LDL.C	rs190934192	1	55334001	A	-0.359	0.040	6.8E-19	0.0060	117.1
S.LDL.C	rs191404723	1	54636232	T	-0.365	0.051	1.5E-12	0.0036	62.1
S.LDL.C	rs191448950	1	55584844	A	-0.469	0.032	1E-48	0.0105	228.0
S.LDL.C	rs192012905	19	44463485	G	-0.308	0.053	7.5E-09	0.0024	42.9
S.LDL.C	rs192570155	1	55246601	C	-0.458	0.045	7.8E-24	0.0074	132.0
S.LDL.C	rs193084249	1	26987646	G	0.177	0.031	2.3E-08	0.0019	37.6
S.LDL.C	rs2007708	19	45410420	A	-0.798	0.104	3.4E-14	0.0050	91.6
S.LDL.C	rs207176	1	55791846	T	0.114	0.017	3.8E-11	0.0023	48.8
S.LDL.C	rs2479408	1	55504188	G	-0.082	0.014	2E-08	0.0019	41.5
S.LDL.C	rs2927472	19	45349369	C	0.124	0.018	5.6E-12	0.0028	59.9
S.LDL.C	rs2954027	8	126485294	A	-0.069	0.010	5.2E-12	0.0023	50.7
S.LDL.C	rs2965149	19	45190766	C	-0.066	0.011	8.1E-10	0.0020	43.7
S.LDL.C	rs2967668	19	45302951	G	-0.163	0.017	1.8E-21	0.0060	115.3
S.LDL.C	rs34042070	16	72101525	G	0.076	0.012	8.6E-10	0.0019	40.0
S.LDL.C	rs35913552	2	21272896	A	-0.115	0.014	9.2E-16	0.0032	70.0
S.LDL.C	rs429358	19	45411941	C	0.220	0.013	1.2E-59	0.0136	297.6
S.LDL.C	rs4609471	1	55493584	A	-0.355	0.030	3.2E-32	0.0098	190.5
S.LDL.C	rs4614977	2	44087024	G	-0.130	0.018	3.2E-12	0.0024	51.9
S.LDL.C	rs4703667	5	74613906	C	0.090	0.010	2.6E-18	0.0039	84.6
S.LDL.C	rs4803748	19	45247048	T	-0.083	0.011	2.1E-14	0.0032	69.4
S.LDL.C	rs533617	2	21233972	C	-0.172	0.022	4E-15	0.0032	68.5
S.LDL.C	rs562556	1	55524237	A	0.082	0.013	6.7E-10	0.0019	41.7
S.LDL.C	rs61457016	19	41085400	G	-0.317	0.056	3.1E-08	0.0019	39.2
S.LDL.C	rs62117161	19	45233385	G	-0.178	0.020	9.2E-19	0.0041	87.7
S.LDL.C	rs62120794	2	21100426	T	-0.165	0.024	1.5E-11	0.0024	49.1
S.LDL.C	rs629301	1	109818306	T	0.123	0.012	2E-24	0.0052	112.8
S.LDL.C	rs6511721	19	11206575	A	-0.084	0.011	2.1E-14	0.0035	76.1
S.LDL.C	rs6663252	1	55630151	C	-0.078	0.012	2.2E-10	0.0020	44.2
S.LDL.C	rs6859	19	45382034	G	-0.070	0.010	1.6E-12	0.0025	53.3
S.LDL.C	rs73048351	19	45160086	A	-0.390	0.064	2.4E-09	0.0027	51.5
S.LDL.C	rs73556990	19	44888175	G	-0.295	0.052	2.8E-08	0.0029	41.4
S.LDL.C	rs74073060	1	55638930	A	-0.455	0.037	2E-33	0.0088	171.7
S.LDL.C	rs7412	19	45412079	T	-0.492	0.025	5.5E-83	0.0256	480.1
S.LDL.C	rs75647206	1	56947591	T	-0.349	0.050	5.2E-12	0.0032	61.8
S.LDL.C	rs76670936	19	45196581	A	-0.129	0.018	5.7E-12	0.0027	58.9
S.LDL.C	rs77021821	4	75684215	T	0.243	0.040	2.7E-09	0.0021	40.9
S.LDL.C	rs78620068	2	21524000	A	-0.116	0.017	4.2E-11	0.0023	48.6
S.LDL.C	rs79668907	19	11257169	T	-0.076	0.012	1.9E-09	0.0021	46.3
S.LDL.C	rs79890446	19	45723446	T	-0.219	0.033	6.2E-11	0.0030	57.3

S.LDL.C	rs8106814	19	45441608	C	-0.097	0.014	2.6E-11	0.0032	62.8
S.LDL.C	rs8111962	19	10915324	T	-0.087	0.014	5.7E-10	0.0019	41.7
S.LDL.C	rs934197	2	21267461	A	0.103	0.011	2.2E-20	0.0043	93.6
S.LDL.C	rs964184	11	116648917	C	-0.106	0.014	6.7E-14	0.0027	58.4
S.LDL.C	rs984976	5	74910870	G	0.078	0.010	1E-14	0.0030	63.9
S.HDL.TG	rs11076174	16	57003146	C	0.096	0.016	2.7E-09	0.0018	39.8
S.HDL.TG	rs11076176	16	57007446	G	0.133	0.014	1.9E-21	0.0049	106.7
S.HDL.TG	rs117241420	8	19770344	A	-0.247	0.041	2.3E-09	0.0020	37.9
S.HDL.TG	rs1260326	2	27730940	C	-0.069	0.010	3.6E-11	0.0022	46.8
S.HDL.TG	rs1268353	11	116639692	T	-0.083	0.010	2.2E-16	0.0033	71.1
S.HDL.TG	rs138287365	4	74781004	C	0.288	0.049	7.2E-09	0.0022	42.7
S.HDL.TG	rs140339333	4	75396456	A	0.248	0.044	2.4E-08	0.0022	42.6
S.HDL.TG	rs151007118	11	116583864	T	0.202	0.034	2.7E-09	0.0021	40.5
S.HDL.TG	rs151193598	4	73303394	A	0.511	0.086	3.6E-09	0.0040	56.5
S.HDL.TG	rs157594	19	45425175	G	0.079	0.012	2.7E-11	0.0030	58.7
S.HDL.TG	rs1800777	16	57017319	A	0.202	0.035	1.4E-08	0.0020	38.2
S.HDL.TG	rs1815786	11	116921390	C	-0.118	0.015	3.6E-14	0.0031	67.4
S.HDL.TG	rs183365738	4	72954415	A	0.524	0.082	2.1E-10	0.0035	58.5
S.HDL.TG	rs184650103	4	74850649	T	0.313	0.046	2.8E-11	0.0027	47.9
S.HDL.TG	rs1848922	2	21471603	C	0.074	0.012	1.4E-09	0.0019	40.5
S.HDL.TG	rs188651594	11	116673091	A	0.236	0.042	3.7E-08	0.0020	35.3
S.HDL.TG	rs190217562	4	75180409	C	0.240	0.040	3.6E-09	0.0022	38.8
S.HDL.TG	rs2954029	8	126490972	T	-0.074	0.010	8.5E-14	0.0028	59.9
S.HDL.TG	rs34356624	8	19903935	C	0.222	0.039	2.3E-08	0.0018	35.1
S.HDL.TG	rs3764261	16	56993324	A	-0.148	0.011	3.6E-42	0.0092	199.9
S.HDL.TG	rs429358	19	45411941	C	0.100	0.013	1.5E-13	0.0028	61.5
S.HDL.TG	rs4296389	2	21142994	T	-0.077	0.011	5.1E-13	0.0026	55.4
S.HDL.TG	rs6065904	20	44534651	A	0.090	0.012	2.8E-14	0.0029	62.0
S.HDL.TG	rs6511720	19	11202306	T	-0.098	0.017	7.3E-09	0.0018	37.9
S.HDL.TG	rs6586886	8	19875408	A	-0.057	0.010	3.7E-08	0.0015	32.7
S.HDL.TG	rs6957745	7	73056750	C	-0.090	0.013	2.4E-11	0.0023	50.6
S.HDL.TG	rs79236614	8	19860460	G	-0.165	0.017	4.4E-21	0.0044	95.3
S.HDL.TG	rs9472125	6	43756169	T	-0.092	0.016	1.9E-08	0.0023	45.2
S.HDL.TG	rs964184	11	116648917	C	-0.199	0.014	1.2E-44	0.0094	204.8
XL.HDL.C	rs11076174	16	57003146	C	-0.093	0.016	7.1E-09	0.0017	36.8
XL.HDL.C	rs111543310	15	59531818	C	0.322	0.049	4.2E-11	0.0033	63.1
XL.HDL.C	rs112835635	15	59351989	G	0.218	0.035	7.6E-10	0.0022	43.6
XL.HDL.C	rs112884731	15	59504897	C	0.527	0.057	2.3E-20	0.0052	92.3
XL.HDL.C	rs112925355	15	59125988	A	0.210	0.029	3.6E-13	0.0027	57.8
XL.HDL.C	rs113298164	15	58855748	T	0.554	0.047	2E-31	0.0083	148.4
XL.HDL.C	rs116142092	15	59751872	T	0.378	0.050	7.6E-14	0.0033	59.7
XL.HDL.C	rs12708967	16	56993211	C	-0.100	0.013	1.4E-13	0.0028	59.7
XL.HDL.C	rs138690293	15	59310760	C	0.638	0.107	2.9E-09	0.0030	48.8
XL.HDL.C	rs139066754	20	44224606	A	-0.106	0.018	6E-09	0.0018	39.9
XL.HDL.C	rs142855631	15	59286876	T	0.652	0.108	1.7E-09	0.0030	49.3
XL.HDL.C	rs142887188	15	60132580	G	0.246	0.042	3.9E-09	0.0023	39.0
XL.HDL.C	rs146842281	15	59356659	T	0.148	0.022	1.8E-11	0.0025	48.5
XL.HDL.C	rs148527372	3	159734448	A	-0.554	0.095	5.7E-09	0.0026	39.8
XL.HDL.C	rs148902553	15	59776836	C	0.382	0.051	5E-14	0.0035	60.2
XL.HDL.C	rs1532624	16	57005479	A	0.127	0.010	1.1E-37	0.0079	170.7
XL.HDL.C	rs174547	11	61570783	C	-0.085	0.010	3.9E-17	0.0034	74.5
XL.HDL.C	rs17821274	15	58684478	C	-0.075	0.010	8.3E-13	0.0025	54.9
XL.HDL.C	rs17821298	15	58690738	A	0.066	0.012	2E-08	0.0016	33.5

XL.HDL.C	rs181412360	15	59158953	C	0.344	0.038	1.5E-19	0.0049	88.0
XL.HDL.C	rs182776276	15	59254589	G	0.549	0.060	5.7E-20	0.0051	88.4
XL.HDL.C	rs183975744	15	59052479	T	0.671	0.120	2.4E-08	0.0022	34.9
XL.HDL.C	rs185241689	15	59143155	G	0.756	0.114	3.8E-11	0.0034	55.6
XL.HDL.C	rs185481	15	58666679	C	0.058	0.010	1.7E-08	0.0017	35.9
XL.HDL.C	rs189375934	15	60196526	G	0.318	0.053	1.9E-09	0.0023	40.2
XL.HDL.C	rs189418461	15	59725202	G	0.375	0.050	6E-14	0.0034	59.9
XL.HDL.C	rs192630343	15	59286102	A	0.619	0.107	7.6E-09	0.0029	47.4
XL.HDL.C	rs1943973	18	47179516	A	0.087	0.013	1.3E-10	0.0020	42.4
XL.HDL.C	rs2070895	15	58723939	A	0.168	0.012	5.8E-47	0.0104	226.0
XL.HDL.C	rs2575876	9	107665739	A	-0.100	0.013	2.7E-15	0.0030	65.2
XL.HDL.C	rs261291	15	58680178	C	0.154	0.010	3.3E-51	0.0110	240.3
XL.HDL.C	rs34718390	15	58682690	A	0.153	0.024	1.1E-10	0.0027	58.9
XL.HDL.C	rs4810479	20	44545048	T	0.117	0.011	1.2E-25	0.0053	115.5
XL.HDL.C	rs60439253	15	58874532	T	0.230	0.028	4E-16	0.0036	72.5
XL.HDL.C	rs61803025	1	161600591	C	-0.104	0.019	1.9E-08	0.0021	41.5
XL.HDL.C	rs67053123	12	125353810	A	0.081	0.015	2.7E-08	0.0017	35.9
XL.HDL.C	rs686030	9	15304782	A	0.083	0.015	1.5E-08	0.0015	33.1
XL.HDL.C	rs76116860	15	59834938	C	0.265	0.041	1.2E-10	0.0025	47.8
XL.HDL.C	rs7873387	9	107595602	C	0.093	0.016	9.2E-09	0.0016	34.4
XL.HDL.C	rs79844529	15	58445279	T	0.182	0.032	1.3E-08	0.0022	41.6
M.VLDL.C	rs10401845	19	11191536	C	-0.088	0.013	2.4E-11	0.0023	49.7
M.VLDL.C	rs1042034	2	21225281	T	0.109	0.011	4.9E-22	0.0045	97.4
M.VLDL.C	rs113560866	11	117015189	C	0.083	0.014	5.9E-09	0.0018	39.1
M.VLDL.C	rs115849089	8	19912370	A	-0.164	0.017	2.7E-22	0.0051	111.0
M.VLDL.C	rs1168041	1	62960250	C	0.094	0.011	1.4E-16	0.0035	76.1
M.VLDL.C	rs117001569	8	19574920	G	-0.238	0.041	1.1E-08	0.0018	35.3
M.VLDL.C	rs1260326	2	27730940	C	-0.094	0.010	5E-20	0.0041	89.1
M.VLDL.C	rs1268353	11	116639692	T	-0.087	0.010	8.2E-18	0.0036	77.4
M.VLDL.C	rs145106713	8	19942183	T	-0.252	0.042	4.2E-09	0.0019	37.3
M.VLDL.C	rs146695330	19	20139610	A	-0.203	0.035	8.3E-09	0.0024	43.0
M.VLDL.C	rs150536132	19	19679560	T	-0.192	0.030	1.4E-10	0.0031	55.3
M.VLDL.C	rs150617279	19	20139234	A	-0.128	0.017	1.8E-13	0.0032	62.6
M.VLDL.C	rs151007118	11	116583864	T	0.263	0.033	7.1E-15	0.0036	68.9
M.VLDL.C	rs17145738	7	72982874	T	-0.110	0.015	4.3E-13	0.0027	57.3
M.VLDL.C	rs17216525	19	19662220	T	-0.153	0.020	2.6E-14	0.0029	61.8
M.VLDL.C	rs183130	16	56991363	T	-0.105	0.012	2.4E-18	0.0045	83.3
M.VLDL.C	rs183305631	19	19597444	A	-0.212	0.032	4.7E-11	0.0031	55.6
M.VLDL.C	rs188651594	11	116673091	A	0.317	0.042	1.1E-13	0.0036	63.8
M.VLDL.C	rs189741280	19	19624481	G	-0.180	0.030	2.6E-09	0.0024	45.7
M.VLDL.C	rs190121281	19	19252779	A	-0.196	0.033	2.6E-09	0.0026	46.0
M.VLDL.C	rs2954021	8	126482077	G	-0.069	0.010	2.8E-12	0.0024	51.4
M.VLDL.C	rs36229786	16	56993901	C	0.079	0.014	1.9E-08	0.0017	36.7
M.VLDL.C	rs3826688	19	45418961	C	0.092	0.011	2.2E-16	0.0037	80.4
M.VLDL.C	rs3846661	5	74639178	G	0.066	0.010	9E-11	0.0021	45.3
M.VLDL.C	rs429358	19	45411941	C	0.111	0.013	3.4E-16	0.0034	74.5
M.VLDL.C	rs579674	11	116528224	G	0.078	0.013	9.8E-10	0.0019	40.8
M.VLDL.C	rs61905067	11	116578982	G	0.239	0.039	1.1E-09	0.0022	46.9
M.VLDL.C	rs6586891	8	19914598	A	-0.065	0.010	8.1E-10	0.0018	39.9
M.VLDL.C	rs7115242	11	116908283	G	-0.117	0.016	8.9E-14	0.0028	61.5
M.VLDL.C	rs71480307	11	116516873	A	0.084	0.015	2.7E-08	0.0016	34.8
M.VLDL.C	rs72660594	1	55636240	C	-0.175	0.029	1.8E-09	0.0021	40.2
M.VLDL.C	rs72836561	17	41926126	T	0.208	0.036	9.9E-09	0.0021	40.4

M.VLDL.C	rs72999033	19	19366632	T	-0.176	0.021	1E-16	0.0035	74.8
M.VLDL.C	rs7533354	1	63217503	C	-0.082	0.015	3E-08	0.0016	33.5
M.VLDL.C	rs7575840	2	21273490	T	0.074	0.011	1.9E-11	0.0023	50.0
M.VLDL.C	rs77182215	11	116942366	A	0.206	0.029	1.2E-12	0.0030	58.6
M.VLDL.C	rs964184	11	116648917	C	-0.234	0.014	8.7E-62	0.0130	284.8
M.VLDL.C	rs984976	5	74910870	G	0.063	0.010	3.5E-10	0.0019	41.9
L.VLDL.C	rs10889331	1	62943007	T	0.086	0.012	3.8E-13	0.0032	55.9
L.VLDL.C	rs117241420	8	19770344	A	-0.232	0.041	2.2E-08	0.0017	32.9
L.VLDL.C	rs1260326	2	27730940	C	-0.089	0.010	8.5E-18	0.0037	78.1
L.VLDL.C	rs1268353	11	116639692	T	-0.073	0.010	8.6E-13	0.0025	53.3
L.VLDL.C	rs150617279	19	20139234	A	-0.109	0.017	4.7E-10	0.0023	44.6
L.VLDL.C	rs151007118	11	116583864	T	0.256	0.034	5E-14	0.0034	64.2
L.VLDL.C	rs17120347	11	116996539	A	0.091	0.015	6.2E-10	0.0019	40.9
L.VLDL.C	rs17216525	19	19662220	T	-0.134	0.020	3.1E-11	0.0022	46.8
L.VLDL.C	rs181583353	11	39151067	G	0.249	0.044	2.4E-08	0.0024	41.5
L.VLDL.C	rs188651594	11	116673091	A	0.289	0.043	2.1E-11	0.0029	51.5
L.VLDL.C	rs191238346	11	39167052	A	0.247	0.044	2.9E-08	0.0023	40.6
L.VLDL.C	rs2001945	8	126477978	C	-0.058	0.010	7E-09	0.0017	35.2
L.VLDL.C	rs34482346	7	72915521	C	-0.128	0.015	1.4E-16	0.0035	74.5
L.VLDL.C	rs4296389	2	21142994	T	-0.074	0.011	4.1E-12	0.0024	50.4
L.VLDL.C	rs438811	19	45416741	T	0.094	0.012	1.8E-14	0.0032	67.5
L.VLDL.C	rs579674	11	116528224	G	0.088	0.013	1E-11	0.0024	50.4
L.VLDL.C	rs7115242	11	116908283	G	-0.092	0.016	5.1E-09	0.0018	37.5
L.VLDL.C	rs71480307	11	116516873	A	0.083	0.015	4E-08	0.0016	33.8
L.VLDL.C	rs72999033	19	19366632	T	-0.150	0.021	2.3E-12	0.0025	53.2
L.VLDL.C	rs76975037	8	19851508	A	-0.148	0.018	6.4E-17	0.0035	74.2
L.VLDL.C	rs77182215	11	116942366	A	0.200	0.029	7.1E-12	0.0029	54.2
L.VLDL.C	rs821840	16	56993886	G	-0.092	0.012	6.1E-15	0.0033	70.3
L.VLDL.C	rs9472125	6	43756169	T	-0.093	0.016	1.4E-08	0.0024	45.5
L.VLDL.C	rs964184	11	116648917	C	-0.214	0.014	2.7E-51	0.0109	233.8
L.VLDL.TG	rs10455872	6	161010118	G	-0.165	0.028	5.4E-09	0.0021	40.6
L.VLDL.TG	rs10889360	1	63173918	T	-0.064	0.011	3E-08	0.0016	33.7
L.VLDL.TG	rs1260326	2	27730940	C	-0.094	0.010	9.8E-20	0.0041	87.3
L.VLDL.TG	rs1268353	11	116639692	T	-0.068	0.010	3E-11	0.0022	46.0
L.VLDL.TG	rs13030345	2	28003174	T	0.070	0.013	4.2E-08	0.0015	32.6
L.VLDL.TG	rs145106713	8	19942183	T	-0.243	0.044	3.4E-08	0.0018	32.6
L.VLDL.TG	rs151007118	11	116583864	T	0.226	0.034	3.4E-11	0.0026	49.6
L.VLDL.TG	rs16996148	19	19658472	T	-0.123	0.020	6.9E-10	0.0019	40.4
L.VLDL.TG	rs17120347	11	116996539	A	0.086	0.015	4.8E-09	0.0017	36.6
L.VLDL.TG	rs17411024	8	19852134	A	-0.154	0.018	9.6E-18	0.0038	78.0
L.VLDL.TG	rs188651594	11	116673091	A	0.241	0.043	2.3E-08	0.0020	35.8
L.VLDL.TG	rs34346326	7	73016181	C	-0.110	0.013	9.4E-17	0.0035	74.1
L.VLDL.TG	rs4350231	1	62922660	A	-0.071	0.011	5.5E-11	0.0021	45.2
L.VLDL.TG	rs438811	19	45416741	T	0.090	0.012	2.9E-13	0.0029	61.2
L.VLDL.TG	rs579674	11	116528224	G	0.078	0.013	1.4E-09	0.0019	39.9
L.VLDL.TG	rs7115242	11	116908283	G	-0.099	0.016	3.9E-10	0.0020	43.0
L.VLDL.TG	rs72999033	19	19366632	T	-0.133	0.021	4.6E-10	0.0020	41.9
L.VLDL.TG	rs77182215	11	116942366	A	0.202	0.029	4.3E-12	0.0029	55.3
L.VLDL.TG	rs9472125	6	43756169	T	-0.091	0.016	3.1E-08	0.0023	43.4
L.VLDL.TG	rs964184	11	116648917	C	-0.206	0.014	7E-48	0.0101	217.5
XL.VLDL.TG	rs10455872	6	161010118	G	-0.181	0.028	1.2E-10	0.0026	49.3
XL.VLDL.TG	rs1168041	1	62960250	C	0.084	0.011	1E-13	0.0028	61.2
XL.VLDL.TG	rs1260326	2	27730940	C	-0.093	0.010	1.4E-19	0.0040	86.3

XL.VLDL.TG	rs1268353	11	116639692	T	-0.057	0.010	1.2E-08	0.0016	33.7
XL.VLDL.TG	rs13234157	7	72971728	A	-0.111	0.015	3.2E-13	0.0027	58.5
XL.VLDL.TG	rs151007118	11	116583864	T	0.209	0.033	5E-10	0.0023	43.7
XL.VLDL.TG	rs17120347	11	116996539	A	0.082	0.014	1.8E-08	0.0016	33.8
XL.VLDL.TG	rs17216525	19	19662220	T	-0.129	0.021	9.2E-10	0.0019	40.1
XL.VLDL.TG	rs17411024	8	19852134	A	-0.125	0.017	8.2E-13	0.0025	54.1
XL.VLDL.TG	rs181583353	11	39151067	G	0.242	0.044	4.6E-08	0.0022	39.8
XL.VLDL.TG	rs186696265	6	161111700	T	-0.326	0.057	1.9E-08	0.0020	35.1
XL.VLDL.TG	rs4296389	2	21142994	T	-0.059	0.011	2.4E-08	0.0015	32.5
XL.VLDL.TG	rs438811	19	45416741	T	0.081	0.013	5E-10	0.0023	44.6
XL.VLDL.TG	rs579674	11	116528224	G	0.081	0.013	2.6E-10	0.0020	43.4
XL.VLDL.TG	rs72999033	19	19366632	T	-0.144	0.022	1.3E-10	0.0021	45.3
XL.VLDL.TG	rs77182215	11	116942366	A	0.182	0.029	3.1E-10	0.0024	45.7
XL.VLDL.TG	rs964184	11	116648917	C	-0.179	0.014	7E-37	0.0076	165.4
XXL.VLDL.TG	rs10455872	6	161010118	G	-0.194	0.028	4.8E-12	0.0029	56.6
XXL.VLDL.TG	rs1168041	1	62960250	C	0.077	0.011	7.7E-12	0.0024	51.6
XXL.VLDL.TG	rs1260326	2	27730940	C	-0.093	0.010	8E-20	0.0040	87.2
XXL.VLDL.TG	rs1268353	11	116639692	T	-0.056	0.010	3.1E-08	0.0015	31.7
XXL.VLDL.TG	rs13233571	7	72971231	T	-0.094	0.015	6.4E-10	0.0019	41.4
XXL.VLDL.TG	rs151007118	11	116583864	T	0.201	0.033	2.1E-09	0.0021	40.5
XXL.VLDL.TG	rs17217098	19	19702384	A	-0.117	0.021	1.9E-08	0.0015	33.3
XXL.VLDL.TG	rs483082	19	45416178	T	0.097	0.012	1.2E-15	0.0034	72.9
XXL.VLDL.TG	rs72999033	19	19366632	T	-0.126	0.021	2.3E-09	0.0018	38.3
XXL.VLDL.TG	rs77182215	11	116942366	A	0.167	0.029	6.8E-09	0.0020	38.6
XXL.VLDL.TG	rs77729186	8	19826318	G	-0.116	0.017	9.5E-12	0.0022	48.5
XXL.VLDL.TG	rs821840	16	56993886	G	-0.065	0.012	2.2E-08	0.0017	35.9
XXL.VLDL.TG	rs964184	11	116648917	C	-0.153	0.014	1.8E-27	0.0056	120.6
XL.HDL.TG	rs11096689	2	21140540	T	-0.073	0.011	9.9E-11	0.0021	44.4
XL.HDL.TG	rs111543310	15	59531818	C	0.492	0.049	1.5E-23	0.0076	147.3
XL.HDL.TG	rs112835635	15	59351989	G	0.331	0.035	2.3E-20	0.0050	100.3
XL.HDL.TG	rs112884731	15	59504897	C	0.712	0.057	1.8E-35	0.0094	169.1
XL.HDL.TG	rs112925355	15	59125988	A	0.290	0.029	1.9E-23	0.0051	110.7
XL.HDL.TG	rs113298164	15	58855748	T	0.750	0.047	1.1E-55	0.0152	273.8
XL.HDL.TG	rs113531395	17	4886829	T	-0.204	0.036	2.4E-08	0.0021	41.0
XL.HDL.TG	rs114716552	15	58600902	G	-0.152	0.021	9E-13	0.0031	60.6
XL.HDL.TG	rs116142092	15	59751872	T	0.473	0.050	1.5E-20	0.0052	93.6
XL.HDL.TG	rs11632970	15	58837515	C	0.078	0.012	5.5E-10	0.0022	48.3
XL.HDL.TG	rs11638718	15	58079462	G	-0.071	0.012	7.4E-09	0.0016	35.0
XL.HDL.TG	rs116802199	17	4801101	C	-0.217	0.032	1.1E-11	0.0027	49.8
XL.HDL.TG	rs116869421	15	58709436	C	-0.360	0.051	4.1E-12	0.0034	66.0
XL.HDL.TG	rs117386336	15	58568077	T	0.218	0.039	3.3E-08	0.0018	35.6
XL.HDL.TG	rs117459981	15	58619066	C	-0.279	0.047	4.3E-09	0.0020	43.1
XL.HDL.TG	rs117597286	15	58587369	C	-0.260	0.036	1.3E-12	0.0030	57.2
XL.HDL.TG	rs117749052	15	58749309	C	0.276	0.037	1.6E-13	0.0044	85.0
XL.HDL.TG	rs117806344	15	58693213	T	-0.377	0.051	2.6E-13	0.0037	70.8
XL.HDL.TG	rs118078695	15	58686409	A	0.295	0.051	1.3E-08	0.0025	48.2
XL.HDL.TG	rs12442723	15	59458663	C	0.102	0.013	1.2E-15	0.0032	69.7
XL.HDL.TG	rs1268353	11	116639692	T	-0.061	0.010	2.3E-09	0.0017	37.5
XL.HDL.TG	rs12899090	15	59901576	G	0.096	0.015	5.8E-10	0.0028	54.8
XL.HDL.TG	rs1318175	15	58586129	T	-0.157	0.013	1.3E-32	0.0072	155.1
XL.HDL.TG	rs13329672	15	58699937	T	0.156	0.011	3.3E-41	0.0095	206.9
XL.HDL.TG	rs138195472	15	58672107	T	0.357	0.035	2.6E-24	0.0064	114.3
XL.HDL.TG	rs138690293	15	59310760	C	0.719	0.107	3.1E-11	0.0038	62.0

XL.HDL.TG	rs142538594	15	58192308	G	0.383	0.055	7E-12	0.0057	91.8
XL.HDL.TG	rs142855631	15	59286876	T	0.728	0.108	2.5E-11	0.0038	61.4
XL.HDL.TG	rs142887188	15	60132580	G	0.257	0.042	1.1E-09	0.0025	42.5
XL.HDL.TG	rs144149061	15	58500098	T	0.838	0.131	2.3E-10	0.0049	66.7
XL.HDL.TG	rs145347194	15	58670135	C	0.221	0.022	4.4E-23	0.0063	135.9
XL.HDL.TG	rs146842281	15	59356659	T	0.256	0.022	4.4E-31	0.0075	146.3
XL.HDL.TG	rs148828254	15	58571224	A	0.209	0.031	5.1E-11	0.0023	50.7
XL.HDL.TG	rs148902553	15	59776836	C	0.477	0.050	8.5E-21	0.0055	94.2
XL.HDL.TG	rs150536132	19	19679560	T	-0.166	0.030	3.2E-08	0.0023	41.1
XL.HDL.TG	rs1532085	15	58683366	G	-0.264	0.010	9E-155	0.0336	748.0
XL.HDL.TG	rs1540037	18	47182664	G	0.092	0.012	7.9E-14	0.0029	63.3
XL.HDL.TG	rs16939881	15	58471979	C	0.315	0.028	1E-29	0.0084	164.1
XL.HDL.TG	rs1711062	15	58508790	C	-0.105	0.011	4.9E-22	0.0052	112.0
XL.HDL.TG	rs17231506	16	56994528	T	0.069	0.011	3.1E-10	0.0020	43.2
XL.HDL.TG	rs181412360	15	59158953	C	0.483	0.038	1.1E-36	0.0097	174.4
XL.HDL.TG	rs181450801	15	59326120	A	0.463	0.076	1.9E-09	0.0031	58.6
XL.HDL.TG	rs181835401	1	63135955	A	-0.090	0.011	4.4E-15	0.0031	67.2
XL.HDL.TG	rs182776276	15	59254589	G	0.732	0.060	5.7E-34	0.0091	157.9
XL.HDL.TG	rs182785673	15	58073964	T	-0.466	0.076	1.3E-09	0.0028	50.4
XL.HDL.TG	rs183276229	15	58742906	C	0.310	0.035	6.3E-18	0.0046	81.3
XL.HDL.TG	rs183975744	15	59052479	T	0.803	0.120	3.4E-11	0.0032	50.0
XL.HDL.TG	rs185241689	15	59143155	G	0.836	0.114	3.8E-13	0.0042	68.1
XL.HDL.TG	rs185533289	15	58782289	C	-0.307	0.055	3.5E-08	0.0019	32.2
XL.HDL.TG	rs186603838	15	58865534	A	0.166	0.030	4E-08	0.0018	31.5
XL.HDL.TG	rs188131745	15	58553702	A	-0.464	0.079	6.2E-09	0.0027	51.3
XL.HDL.TG	rs189375934	15	60196526	G	0.429	0.053	8.4E-16	0.0042	73.1
XL.HDL.TG	rs189418461	15	59725202	G	0.470	0.050	9.9E-21	0.0053	94.0
XL.HDL.TG	rs190121281	19	19252779	A	-0.196	0.033	2.7E-09	0.0026	46.0
XL.HDL.TG	rs190548956	15	59985051	A	0.266	0.042	3.8E-10	0.0023	43.9
XL.HDL.TG	rs191448950	1	55584844	A	-0.217	0.032	1.3E-11	0.0022	48.4
XL.HDL.TG	rs192060595	15	58907990	C	0.329	0.057	9.8E-09	0.0025	43.1
XL.HDL.TG	rs192630343	15	59286102	A	0.709	0.107	5.1E-11	0.0038	62.3
XL.HDL.TG	rs192924868	15	59231939	C	0.115	0.021	3.1E-08	0.0020	37.9
XL.HDL.TG	rs193092110	15	58730460	A	0.303	0.035	2.8E-17	0.0044	77.7
XL.HDL.TG	rs1998013	1	55958030	T	-0.230	0.035	1.1E-10	0.0022	48.1
XL.HDL.TG	rs2044332	15	58646641	A	0.122	0.014	8.2E-17	0.0038	81.5
XL.HDL.TG	rs2070895	15	58723939	A	0.302	0.012	3E-148	0.0337	749.9
XL.HDL.TG	rs2217970	15	60090978	A	-0.130	0.019	3.8E-11	0.0025	49.2
XL.HDL.TG	rs2414585	15	58785756	G	-0.308	0.048	1.6E-10	0.0028	54.5
XL.HDL.TG	rs2642636	15	58363242	G	-0.072	0.010	3.7E-12	0.0024	52.5
XL.HDL.TG	rs28370984	15	58629308	C	0.344	0.032	9.9E-27	0.0066	127.5
XL.HDL.TG	rs28601761	8	126500031	G	-0.068	0.010	1.8E-11	0.0023	49.2
XL.HDL.TG	rs2881925	2	20390694	A	-0.056	0.010	1.4E-08	0.0016	34.0
XL.HDL.TG	rs2932196	15	57912338	T	0.056	0.010	2.5E-08	0.0015	32.4
XL.HDL.TG	rs34101191	15	58793567	A	0.075	0.010	1.4E-12	0.0028	59.8
XL.HDL.TG	rs35138338	15	58744481	T	-0.089	0.013	3E-11	0.0033	70.4
XL.HDL.TG	rs35684611	15	58721302	G	-0.138	0.014	2.4E-21	0.0047	100.8
XL.HDL.TG	rs426684	15	58662280	T	0.066	0.010	4.1E-11	0.0022	47.3
XL.HDL.TG	rs439401	19	45414451	C	0.086	0.011	1.3E-14	0.0032	68.3
XL.HDL.TG	rs4775039	15	58670897	G	0.160	0.011	1.4E-45	0.0129	280.9
XL.HDL.TG	rs479084	15	58666087	G	-0.120	0.010	1.1E-29	0.0067	145.7
XL.HDL.TG	rs490098	15	58691225	A	-0.179	0.013	1.9E-42	0.0093	202.4
XL.HDL.TG	rs4939873	18	47062054	T	0.133	0.023	1.4E-08	0.0017	36.4

XL.HDL.TG	rs55817218	15	58562006	A	-0.170	0.020	6.2E-17	0.0041	88.9
XL.HDL.TG	rs55861554	15	58761235	C	0.067	0.011	6.3E-10	0.0020	43.5
XL.HDL.TG	rs56296027	2	21134011	C	-0.062	0.011	3.2E-08	0.0015	32.7
XL.HDL.TG	rs572107	15	59055810	C	-0.069	0.010	5.2E-11	0.0022	46.9
XL.HDL.TG	rs61999891	15	58299599	A	0.122	0.017	3.5E-12	0.0030	58.9
XL.HDL.TG	rs62001693	15	58614892	A	-0.221	0.034	1.3E-10	0.0028	59.5
XL.HDL.TG	rs6589592	11	116957907	G	-0.105	0.016	2E-11	0.0023	50.6
XL.HDL.TG	rs7178935	15	59368167	A	0.064	0.011	1E-08	0.0016	34.6
XL.HDL.TG	rs72739708	15	57733779	T	0.114	0.021	5E-08	0.0015	32.3
XL.HDL.TG	rs73424577	15	58869185	G	0.305	0.028	5.5E-27	0.0064	128.9
XL.HDL.TG	rs73959582	18	47148886	C	0.097	0.014	2.4E-11	0.0024	52.5
XL.HDL.TG	rs74073060	1	55638930	A	-0.218	0.037	8.1E-09	0.0020	39.1
XL.HDL.TG	rs74537322	15	58342102	G	-0.406	0.065	7.2E-10	0.0028	49.6
XL.HDL.TG	rs75870978	15	58177266	G	0.391	0.066	4.6E-09	0.0055	60.8
XL.HDL.TG	rs76116860	15	59834938	C	0.339	0.041	3.1E-16	0.0040	78.2
XL.HDL.TG	rs76212899	15	58263295	G	-0.157	0.027	5.2E-09	0.0022	42.6
XL.HDL.TG	rs76438892	15	58687932	G	-0.271	0.047	1.1E-08	0.0018	35.7
XL.HDL.TG	rs78321025	15	58108078	A	0.248	0.034	9.6E-13	0.0035	67.9
XL.HDL.TG	rs79202680	17	4692640	T	-0.242	0.035	5.2E-12	0.0029	55.8
XL.HDL.TG	rs8025975	15	59696602	G	0.097	0.015	4.2E-10	0.0021	44.8
XL.HDL.TG	rs8042174	15	58685970	C	-0.206	0.020	6.8E-25	0.0059	128.8
XL.HDL.TG	rs8043310	15	58731818	A	0.360	0.039	1.2E-19	0.0050	96.6
XL.HDL.TG	rs8100204	19	19393714	A	-0.096	0.016	4.3E-09	0.0021	44.9
XL.HDL.TG	rs935202	15	58457569	A	0.083	0.011	1.1E-14	0.0031	67.2
XL.HDL.TG	rs938507	15	58582034	A	0.139	0.014	6.8E-22	0.0045	97.2
XL.HDL.TG	rs964184	11	116648917	C	-0.155	0.014	1.1E-27	0.0057	123.4
XL.HDL.TG	rs97384	11	61624181	C	0.084	0.010	1.2E-15	0.0034	74.0

Supplementary Table 5. Genetic instruments for lipid drug targets, as seleted and extracted from Global Lipids Genetics Consortium (GLGC) GWAS dataset.

Phenotype	Target	Proxy treatment	SNP	Chr	Position (hg18)	Eff_allele	Effect	SE	P-value	R2	F
HDL-C	CETP	CETP inhibitors	rs12446867	16	57052901	G	0.034	0.004	1.8E-16	0.0005	84.0
HDL-C	CETP	CETP inhibitors	rs12448528	16	56985555	G	0.199	0.005	2.1E-344	0.0139	2577.3
HDL-C	CETP	CETP inhibitors	rs12597002	16	57002404	C	0.085	0.004	1.1E-102	0.0029	535.4
HDL-C	CETP	CETP inhibitors	rs12720917	16	57019392	C	0.098	0.006	5.9E-68	0.0023	407.0
HDL-C	CETP	CETP inhibitors	rs12928552	16	57048707	G	0.050	0.008	2.2E-09	0.0002	35.6
HDL-C	CETP	CETP inhibitors	rs13306673	16	56900931	C	0.098	0.006	2.8E-48	0.0016	288.0
HDL-C	CETP	CETP inhibitors	rs13306677	16	56926195	A	0.090	0.006	1.4E-50	0.0014	268.4
HDL-C	CETP	CETP inhibitors	rs1566439	16	57024662	C	0.027	0.004	3.5E-15	0.0004	67.9
HDL-C	CETP	CETP inhibitors	rs16963520	16	56936563	A	0.071	0.007	3.1E-25	0.0014	130.7
HDL-C	CETP	CETP inhibitors	rs17290922	16	57024317	G	0.055	0.008	3.4E-13	0.0006	58.9
HDL-C	CETP	CETP inhibitors	rs17370142	16	57050348	T	0.034	0.006	1.2E-11	0.0002	43.8
HDL-C	CETP	CETP inhibitors	rs1864163	16	56997233	G	0.225	0.004	3.6E-573	0.0198	3745.5
HDL-C	CETP	CETP inhibitors	rs1875236	16	57033696	A	0.059	0.007	1.4E-18	0.0006	113.9
HDL-C	CETP	CETP inhibitors	rs247615	16	56984763	A	0.076	0.004	2.9E-62	0.0020	371.2
HDL-C	CETP	CETP inhibitors	rs247616	16	56989590	T	0.243	0.004	1.2E-802	0.0245	4650.2
HDL-C	CETP	CETP inhibitors	rs289719	16	57009941	T	0.113	0.004	5.4E-173	0.0056	1048.7
HDL-C	CETP	CETP inhibitors	rs289726	16	57074451	T	0.036	0.004	1.3E-22	0.0006	112.2
HDL-C	CETP	CETP inhibitors	rs289745	16	57019532	A	0.028	0.004	2.3E-20	0.0004	66.6
HDL-C	CETP	CETP inhibitors	rs4329913	16	56905432	C	0.041	0.006	1.4E-11	0.0006	54.1
HDL-C	CETP	CETP inhibitors	rs5883	16	57007353	T	0.115	0.008	1.8E-31	0.0015	254.0
HDL-C	CETP	CETP inhibitors	rs7188963	16	56931565	C	0.059	0.004	3.2E-39	0.0012	220.1
HDL-C	CETP	CETP inhibitors	rs7204290	16	56968039	G	0.030	0.004	1.5E-14	0.0004	71.4
HDL-C	CETP	CETP inhibitors	rs7499911	16	57036440	G	0.060	0.011	1.3E-08	0.0004	40.4
HDL-C	CETP	CETP inhibitors	rs9938160	16	56984590	C	0.060	0.005	3.2E-25	0.0014	125.6
LDL-C	HMGCR	Statins	rs10066707	5	74560579	A	0.050	0.005	3.0E-19	0.0012	108.1
LDL-C	HMGCR	Statins	rs10515198	5	74641560	A	0.060	0.006	6.0E-22	0.0007	114.7
LDL-C	HMGCR	Statins	rs3857388	5	74620377	C	0.042	0.006	2.2E-11	0.0004	68.5
LDL-C	HMGCR	Statins	rs7703051	5	74625487	A	0.073	0.004	1.4E-77	0.0026	443.6
LDL-C	NPC1L1	Ezetimibe	rs2073547	7	44582331	G	0.049	0.005	1.9E-21	0.0007	125.0
LDL-C	NPC1L1	Ezetimibe	rs217386	7	44600695	G	0.036	0.004	1.2E-19	0.0006	110.2
LDL-C	NPC1L1	Ezetimibe	rs7798185	7	44570717	A	0.041	0.007	1.9E-09	0.0004	37.3
LDL-C	PCSK9	PCSK9 inhibitors	rs10493176	1	55538552	T	0.078	0.010	2.5E-14	0.0012	105.4
LDL-C	PCSK9	PCSK9 inhibitors	rs11206510	1	55496039	T	0.083	0.005	2.4E-53	0.0018	312.2
LDL-C	PCSK9	PCSK9 inhibitors	rs11583974	1	55551718	A	0.065	0.012	4.0E-09	0.0002	24.5
LDL-C	PCSK9	PCSK9 inhibitors	rs12067569	1	55528629	A	0.089	0.010	2.0E-17	0.0005	85.3
LDL-C	PCSK9	PCSK9 inhibitors	rs2479394	1	55486064	G	0.039	0.004	1.6E-19	0.0006	105.1
LDL-C	PCSK9	PCSK9 inhibitors	rs2479409	1	55504650	G	0.064	0.004	2.5E-50	0.0018	317.0
LDL-C	PCSK9	PCSK9 inhibitors	rs2483205	1	55518316	C	0.051	0.005	4.7E-20	0.0013	102.6
LDL-C	PCSK9	PCSK9 inhibitors	rs4927193	1	55509872	T	0.035	0.006	4.3E-11	0.0003	48.7
LDL-C	PCSK9	PCSK9 inhibitors	rs502576	1	55512882	G	0.065	0.007	2.9E-22	0.0015	122.3
LDL-C	PCSK9	PCSK9 inhibitors	rs585131	1	55524116	T	0.064	0.005	2.7E-35	0.0012	205.3
LDL-C	PCSK9	PCSK9 inhibitors	rs7552841	1	55518752	T	0.037	0.004	5.4E-15	0.0006	88.1
LDL-C	ABCG5G8	Bile acid resins	rs10208987	2	44043135	T	0.049	0.007	2.4E-12	0.0004	66.8
LDL-C	ABCG5G8	Bile acid resins	rs1025447	2	44022970	C	0.042	0.005	3.8E-16	0.0005	80.2
LDL-C	ABCG5G8	Bile acid resins	rs4148214	2	44079004	T	0.039	0.004	3.8E-25	0.0007	129.8
LDL-C	ABCG5G8	Bile acid resins	rs4953023	2	44074000	G	0.131	0.007	1.7E-66	0.0027	454.5
LDL-C	ABCG5G8	Bile acid resins	rs6544713	2	44073881	T	0.081	0.004	4.8E-83	0.0027	467.8
LDL-C	ABCG5G8	Bile acid resins	rs75279593	2	44085035	A	0.074	0.012	1.4E-08	0.0005	42.7
LDL-C	LDLR	LDL receptor	rs1010679	19	11207102	T	0.102	0.006	3.5E-54	0.0030	253.7
LDL-C	LDLR	LDL receptor	rs3786721	19	11146499	T	0.047	0.004	2.9E-31	0.0011	178.3

LDL-C	LDLR	LDL receptor	rs3786722	19	11161537	C	0.075	0.004	5.5E-63	0.0021	358.8
LDL-C	LDLR	LDL receptor	rs379309	19	11284302	C	0.031	0.004	1.4E-13	0.0005	81.8
LDL-C	LDLR	LDL receptor	rs5742911	19	11243445	A	0.061	0.006	4.8E-24	0.0014	111.9
LDL-C	LDLR	LDL receptor	rs5927	19	11233941	G	0.035	0.005	2.8E-13	0.0005	75.9
LDL-C	LDLR	LDL receptor	rs6511720	19	11202306	G	0.221	0.006	3.8E-262	0.0086	1479.6
LDL-C	LDLR	LDL receptor	rs688	19	11227602	T	0.054	0.004	1.0E-43	0.0014	240.8