

## Genetically Elevated LDL Associates with Lower Risk of Intracerebral Hemorrhage

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## **Genetically Elevated LDL Associates with Lower Risk of Intracerebral Hemorrhage**

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## ABSTRACT

**Objective:** Observational studies point to an inverse correlation between LDL cholesterol levels and risk of intracerebral hemorrhage (ICH), but it remains unclear whether this association is causal. We tested the hypothesis that genetically-elevated LDL is associated with reduced risk of ICH.

**Methods:** We constructed one polygenic risk score (PRS) per lipid trait (total cholesterol, LDL, HDL and triglycerides) using independent genome-wide significant SNPs for each trait. We used data from 316,428 individuals enrolled in the UK Biobank to estimate the effect of each PRS on its corresponding trait, and data from 1,286 ICH cases and 1,261 matched controls to estimate the effect of each PRS on ICH risk. We used these estimates to conduct Mendelian Randomization analyses.

**Results:** We identified 410, 339, 393, and 317 lipid-related SNPs for total cholesterol, LDL, HDL and triglycerides, respectively. All four PRSs were strongly associated with their corresponding trait (all  $p < 1 \times 10^{-100}$ ). While one standard deviation increase in the PRSs for total cholesterol (OR 0.92, 95%CI 0.85-0.99;  $p=0.03$ ) and LDL cholesterol (OR 0.88; 95%CI, 0.81-0.95;  $p=0.002$ ) were inversely associated with ICH risk, no significant associations were found for HDL and triglycerides (both  $p > 0.05$ ). Mendelian Randomization analyses indicated that 1 mmol/L (38.67 mg/dL) increase of genetically-instrumented total and LDL cholesterol were associated with 23% (OR 0.77; 95%CI 0.65-0.98;  $p=0.03$ ) and 41% lower risks of ICH (OR 0.59; 95%CI 0.42-0.82;  $p=0.002$ ), respectively.

**Interpretation:** Genetically elevated LDL levels were associated with lower risk of ICH, providing support for a potential causal role of LDL cholesterol in ICH.

## INTRODUCTION

Novel therapies are needed for spontaneous, non-traumatic intracerebral hemorrhage (ICH), a disease responsible for 50% of stroke-related deaths and disability with no proven acute treatments.<sup>1</sup> Several complementary lines of evidence highlight the importance of lipid metabolism as a promising pathophysiological pathway for risk prediction and therapeutic strategies. The Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) trial reported that statin treatment in surviving adults with a first ischemic stroke reduced the risk of recurrent ischemic stroke but increased the risk of ICH.<sup>2</sup> However, this trial could not exclude possible pleiotropic effects of statins, whereby the effects on ICH may be independent of the effects of statins on lipids.<sup>3</sup> In addition, clinical trials investigating statins as the primary cardiovascular disease prevention strategy have yielded inconsistent results for ICH risk.<sup>4–6</sup>

Results from several observational studies evaluating data from thousands of ICH cases also reported inverse associations between lipid levels and ICH risk. The Genetic and Environmental Risk Factors for Hemorrhagic Stroke (GERFHS) Study reported a one third lower ICH risk among study participants with a past medical history of hypercholesterolemia.<sup>7</sup> Other observational studies reported that higher low-density lipoprotein cholesterol (LDL-C) levels were correlated with ICH severity and 3-month clinical outcome.<sup>8</sup> While promising, these studies are limited by the observational nature of the underlying design, which preclude the possibility of establishing causality.

Population genetics provides powerful tools to overcome such limitations in causal inference. Genetic variants known to associate with lipid levels can be used as instruments to evaluate the causal relationship between different lipid fractions and risk of ICH.<sup>9</sup> These genetic variants are randomly distributed during meiosis and are ought to be exempt from confounding by

environmental exposures.<sup>9–11</sup> A recent report from the China Kadoorie Biobank involving several thousand ICH cases demonstrated concordant effects estimates between the observational and genetic analyses for LDL-C and ICH risk in Chinese adults, thereby providing strong support for the causal relevance for this association in this ethnic group. However, in contrast with highly significant inverse observational associations of directly-measured LDL-C and ICH risk, the associations of genetically-instrumented LDL-C and ICH risk were not statistically significant in this study.<sup>12</sup>

To overcome the limitations of previous randomized trials, observational studies and genetic analyses, we conducted a multistage genetic association study that combined polygenic risk score<sup>13</sup> (PRS) and Mendelian randomization<sup>9</sup> (MR) analyses to test the hypothesis that genetically-elevated lipid levels are associated with a lower risk of ICH. We separately evaluated the associations of genetically-instrumented differences in total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C) and triglycerides. Because of the known differences in underlying biology according to the location of ICH within the brain, we conducted stratified analyses based on hemorrhage location.<sup>14</sup>

## METHODS

### Study design

We conducted a three-stage genetic study in participants from European ancestry. All study stages utilized publicly available individual-level data accessible through the National Institute of Health database of Genotypes and Phenotypes and UK Biobank. All studies had approval from the local institutional review board or ethics committee at each participating institution. Informed consent was obtained from all study participants or their legally authorized representatives, or consent was waived via protocol-specific allowance. All study participants had available genome-wide genotyping data, allowing the implementation of principal component analysis to confirm ancestry and account for population stratification. In **stage 1**, we constructed four PRSs for TC, LCL-C, HDL-C and triglycerides using genetic variants known to associate with each of these traits in previous studies.<sup>15–17</sup> We estimated the effect of each PRS on its corresponding lipid trait using data from the UK Biobank. In **stage 2**, we conducted an individual participant data meta-analysis of genetic studies of ICH to evaluate the association between the four PRSs created in stage 1 and risk of ICH. This stage included individual-level data from three case-control genetic studies: the Genetics of Cerebral Hemorrhage on Anticoagulation (GOCHA) Study,<sup>18</sup> International Stroke Genetics Consortium ICH Study (ISGC-ICH),<sup>19</sup> and the Genetic and Environmental Risk Factors for Hemorrhagic Stroke (GERFHS) Study.<sup>7</sup> In **stage 3**, we combined the effect estimates from stage 1 (associations between each PRS and its corresponding lipid fraction) and stage 2 (associations between each PRS and ICH risk) to conduct MR analyses of genetically-instrumented lipid levels and ICH risk.

### Blood lipids in the UK Biobank

Stage 1 utilized data from the UK Biobank, a prospective population-based cohort study that recruited 500,000 community-dwelling individuals aged 40 to 69 years between 2006 and 2010

from across the United Kingdom. Study participants undergone multiple baseline physical measures, provided blood, urine and saliva samples for different analysis, provided detailed information about themselves, and agreed to have their health followed.<sup>20</sup> We used recently released values for lipid traits which were measured using a Beckman Colter AU5800 clinical chemistry analyzer. Analyzer performance was verified continually throughout the project.

### **Ascertainment of ICH cases and ICH-free controls**

ICH cases included in Stage 2 were defined as new and acute (<24hours) neurological deficits with consistent findings in neuroimaging. Cases were aged >55 years in GOCHA, and >18 years in GERFHS and the ISGC-ICH. Patients were excluded if they were taking anticoagulants (antiaggregants were permitted) or had head trauma, hemorrhagic conversion of an ischemic stroke, intracerebral tumor, intracerebral vascular malformation, vasculitis, or any other cause of secondary ICH. Controls included in Stage 2 were ICH-free individuals enrolled at the same study sites as cases and followed the same age and ethnicity criteria. Controls were sampled by random digit dialing in GERFHS and by random selection from ambulatory clinics in GOCHA and ISGC-ICH.

### **Neuroimaging analysis**

For ICH cases included in Stage 2, stroke neurologists or neuroradiologists at each participating site confirmed the diagnosis and, following the known differences in underlying biology, classified each case as lobar or nonlobar according to location.<sup>21</sup> ICH originating in the corticosubcortical junction was defined as lobar, whereas ICH selectively involving the thalamus, internal capsule, basal ganglia, brainstem, or cerebellum was defined as nonlobar.

### **Genetic data**



Study participants were genotyped using the UK Biobank Axiom Array (UK Biobank Study), Illumina HumanHap610-Quad (GOCHA and ISGC-ICH), and Affymetrix 6.0 (GERFHS). Standard quality control procedures<sup>22</sup> were implemented separately for each participating study. SNPs with palindromic alleles (A/T or C/G), a genotype call rate <95%, significant difference in missingness between cases and controls ( $p < 0.05$ ), deviation from Hardy-Weinberg Equilibrium ( $p < 1 \times 10^{-6}$ ), or minor allele frequency (MAF) <1% were removed. Individuals with a genotype call rate <95%, inconsistency between self-reported and genotyped sex, an inferred first or second degree relative in the sample, and a genome-wide heterozygosity F-statistic greater than five times the standard deviation were filtered out from the analysis. Principal component analysis was implemented to account for population structure.<sup>23</sup> After quality control and principal component analyses, genetic data were prephased and imputed to 1000 Genomes integrated reference panels (Phase 3 integrated variant set release in NCBI build 37).<sup>24</sup> Post-imputation filters included MAF <1%, an information score <0.7, and missing estimates in one or more studies.

### **Statistical analyses**

We present discrete variables as counts (percentage) and continuous variables as mean (standard deviation [SD]) or median (interquartile range [IQR]), as appropriate.

**Stage 1. Derivation of lipid-related PRSs.** We used PRSs to model each individual's genetic load of lipid-related risk alleles. To build these PRSs, we queried the GWAS Catalog and reviewed published genome-wide association studies of lipids.<sup>15–17</sup> Following similar recent analyses, we selected independent ( $r^2 < 0.3$ ) and common (MAF >5%) single nucleotide polymorphisms (SNPs) associated with at least one lipid trait at  $p < 5 \times 10^{-8}$ .<sup>15</sup> All selected SNPs were aligned to the GRCh37 assembly of the human genome and, for each SNP, the allele associated with an increase in lipid levels was identified and utilized as the tested allele in downstream analyses. The epsilon variants within *APOE* were not included in these PRSs, as they are not captured by

commercially available genotyping arrays and there is a plausible alternative pathway via cerebral amyloid angiopathy that could mediate its association with ICH.<sup>25</sup> The PRS for each individual is the sum of the product of the risk allele counts for each locus multiplied by the allele's reported effect on the corresponding lipid level. To assure common directionality of effects, the allele associated with higher lipid levels was selected as the effect allele during scoring. One PRS per lipid trait was generated (TC, LDL-C, HDL-C and triglycerides). All four PRSs were standardized (by subtracting the mean and dividing by the SD) and entered as continuous predictors into regression models. With this approach, the beta for the PRS can be interpreted as the change in ICH risk per 1 SD increase of the PRS. The association between each PRS and its corresponding lipid trait was evaluated using linear regression, adjusting for age, sex, and principal components 1 to 4. The primary analysis was restricted to unrelated study participants of genetically-determined European ancestry who were not taking lipid-lowering medications. In secondary analyses, we followed a less restrictive approach and included all study participants of self-reported European ancestry.

**Stage 2. Association between each PRS and ICH risk.** We evaluated the association between each PRS and risk of ICH via logistic regression adjusting for age, sex and principal components 1 to 4. Analyses were completed separately in each genetic study and pooled in meta-analysis using fixed-effects (primary analysis) and random effects (secondary analysis) approaches with evaluation of heterogeneity via Cochrane's Q (with corresponding p) and  $I^2$ . In sensitivity analyses, we excluded genetic variants within *CETP*, a locus that powerfully modifies lipid levels previously shown to be associated with ICH risk. To account for recognized differences in underlying causative ICH mechanism by location within the brain, lipid traits with significant associations were taken forward to stratified analyses based on hemorrhage location (lobar or nonlobar).

**Stage 3. Mendelian randomization analyses.** The causal relationship between genetically-determined lipid levels and ICH risk was evaluated via MR analyses using each PRS as an instrument. The primary MR analysis utilized the ratio method combining the point estimates and standards errors from Stage 1 (denominator) and Stage 2 (numerator). In secondary analyses, we implemented other MR methods usually used with summary level data, including inverse-variance weighted, weighted median, MR-Egger, and Mendelian Randomization Pleiotropy Residual Sum and Outlier (MR-PRESSO) analyses. To confirm the validity of our results, we implemented MR analyses of genetically-instrumented cholesterol levels and risk of ischemic stroke using estimates for lipids levels from the UK Biobank and estimates for ischemic stroke risk from the MEGASTROKE<sup>26</sup> consortium; these results were compared with previously reported MR studies for the same analysis.

**Software.** We used the GWAS Catalog to identify genetic variants related to lipid levels, PLINK for quality control procedures and generation of PRSs,<sup>27</sup> EIGENSTRAT for principal component analysis,<sup>28</sup> SHAPEIT for genotype prephasing,<sup>29</sup> IMPUTE2 for imputation,<sup>30</sup> and Rstudio (Version1.1.453) for association testing, meta-analysis, and MR analysis.<sup>31</sup>

**RESULTS.** Selected population characteristics are presented in Table 1.

### **Stage 1: Derivation of cholesterol-related PRSs**

We identified 1,459 common (MAF >5%) genetic variants reported by prior studies as strongly associated with one or more of the lipid traits of interest. These common variants included 410 SNPs for TC, 339 for LDL-C, 393 for HDL-C and 317 for triglycerides (Supplementary Tables 1-4). We built four different PRSs, one for each lipid trait, and evaluated their associations with their corresponding trait in the UK Biobank. All four PRSs showed highly significant associations with their corresponding lipid trait, both in the primary analysis considering 316,428 (mean age 68 [SD 8], 170,871 females [54%]) unrelated individuals of European ancestry not on lipid-lowering medications (all  $p < 1 \times 10^{-100}$ ), and in the secondary analysis not applying any exclusion criteria (all  $p < 1 \times 10^{-100}$ ; Table 2).

### **Stage 2: Association between each PRS and ICH risk**

A total of 1,286 ICH cases (mean age 71 [SD 13], 593 females [46%]) and 1,261 ICH-free controls (mean age 68 [SD 14], 613 females [49%]) from the GOCHA, ISGC ICH, and GERFHS studies were included in association testing (Table 1). For TC, each additional SD increase of the corresponding PRS was associated with an 8% lower ICH risk (OR 0.92, 95%CI 0.85-0.99;  $p=0.03$ ). When evaluating specific lipid fractions, we found that each additional SD increase of the LDL-C- based PRS was associated with a 12% lower risk of ICH (OR 0.88, 95%CI 0.81-0.95;  $p=0.002$ ) (Table 3). Similar results were obtained when utilizing random-effects meta-analyses. These associations remained significant after removing *CETP* (Table 4). We did not find significant associations for the PRSs based on HDL-C or triglycerides (both  $p > 0.05$ ).

### **Stage 3: Mendelian randomization analysis**

The primary MR analysis implemented the ratio method utilizing the effect estimates obtained in Stages 1 and 2. As shown in Table 5, each 1 mmol/L (or 38.67 mg/dL) increase of genetically-instrumented TC was associated with a 23% reduction of ICH risk (OR 0.77, 95%CI 0.60-0.98;  $p=0.03$ ), whereas a 1 mmol/L (or 38.67 mg/dL) increase of genetically-instrumented LDL-C was associated with a 41% reduction in this risk (OR 0.59, 95%CI 0.42-0.82;  $p=0.002$ ). These results remained unaltered when the effect of each PRS on its corresponding lipid trait was estimated without excluding any individuals from the UK Biobank (data not shown). Secondary analyses utilizing an  $r^2<0.1$  yielded comparable results for LDL-C (OR 0.62, 95%CI 0.41-0.94;  $p=0.02$ ) and confirmed the direction of effect for TC without reaching statistical significance (OR 0.94, 95%CI 0.87-1.02;  $p=0.17$ ). Secondary analyses utilizing other MR methods confirmed the direction of effect, although not all yielded statistical significance (Table 5). There was no indication of pleiotropy for either TC or LDL-C (MR-egger intercepts and MR-PRESSO global test  $p>0.05$ ). MR analyses for LDL-C and risk of ischemic stroke utilizing the estimates for LDL-C from the UK Biobank yielded similar results to those reported by prior publications based on lipid estimates from the Global Lipid Genetics Consortium (Table 6).

### **Stratification based on location of the ICH within the brain**

A total of 1,243 ICH cases (96%) had available information about the location of the hematoma within the brain. Of these, 539 (43%) had lobar ICH and 704 (56%) had nonlobar ICH. Location-specific analyses indicated that the association between the LDL-C PRS and ICH risk remained significant for both lobar (OR 0.81, 95%CI 0.73-0.89;  $p<0.001$ ) and nonlobar ICH (OR 0.90, 95%CI 0.82-0.99;  $p=0.04$  - Table 7), whereas the association between ICH risk and the TC PRS was significant for lobar (OR 0.89, 95%CI 0.80 - 0.99;  $p=0.03$ ) but not nonlobar bleeds (OR 0.94, 95%CI 0.85-1.08;  $p=0.20$ ). Mendelian randomization analyses implementing the ratio method using these location-specific estimates indicated that genetically-elevated LDL-C was associated

with a decreased risk of ICH for both lobar (OR 0.41, 95%CI 0.27-0.64;  $p<0.001$ ) and nonlobar ICH (OR 0.66, 95%CI 0.44-0.97;  $p=0.04$ ), whereas genetically elevated TC was associated with a decreased risk of lobar (OR 0.70, 95%CI 0.51-0.96;  $p=0.03$ ) but not nonlobar ICH (OR 0.73, 95%CI 0.62-1.11;  $p=0.20$ ).

## DISCUSSION

We report the results of a multi-stage genetic association study that evaluated whether genetically-instrumented levels of different lipid traits influence the risk of spontaneous ICH. We constructed four PRSs to model the aggregate genetic load of risk alleles for TC, LDL-C, HDL-C and triglycerides; assessed for association between each PRS and its corresponding lipid trait; assessed for association between each PRS and ICH risk; and utilized the estimates obtained in prior steps to conduct MR analyses. We found that all four PRSs were robustly associated with their corresponding lipid trait and that the PRSs for TC and LDL-C were inversely associated with ICH risk. Analyses stratified by location indicated that these associations remained significant for both lobar and nonlobar ICH, with stronger associations for lobar bleeds. Of note, the genetically-instrumented HDL-C and triglycerides levels were not associated with ICH risk.

Previous studies provided promising, but inconclusive, evidence on the relevance of LDL-C for risk of ICH. The evidence from randomized control trials of statins is inconsistent. The SPARCL trial, a study focused on the utilization of statins for secondary prevention after a first stroke or transient ischemic attack, found an unexpected increment in ICH risk as a side effect.<sup>2</sup> However, large meta-analyses of statin trials yielded conflicting conclusions for this question, with some finding similar associations<sup>5,12</sup> and others finding null results.<sup>4</sup> These inconsistencies may be driven by a lack of statistical power, as ICH is a rare event and statin trials, while large, do not accrue the necessary number of events to appropriately evaluate this relationship. From an observational perspective, the Genetic and Environmental Risk Factors for Hemorrhagic Stroke Study reported a reduction in ICH risk among study participants with a history of hypercholesterolemia.<sup>7</sup> In terms of genetic evidence, a candidate gene study focused on the powerful lipid regulatory gene *CETP* found an association between variants at this locus and ICH risk.<sup>32</sup> While promising, each of these pieces of evidence has an important limitation: the inconsistency of results observed in clinical

trials of statin treatment, the inability to draw causal conclusions in observational studies, and the and the single-locus design nature of the *CETP* study.

The present study provides important additional evidence to support a causal role of LDL-C cholesterol in risk of ICH. Genetic variants known to be associated with lipid levels can be used as instruments to evaluate a causal relationship between different lipid fractions and ICH risk.<sup>33</sup> We deployed two specific strategies to maximize the accuracy and power of this analytical strategy. First, all analytical steps used individual level phenotypic and genotypic data, permitting the utilization of rigorous quality control procedures and the implementation of sensitivity analyses to evaluate whether results were robust to different modeling strategies. Second, we estimated the effect of our instruments, the four lipid-related PRSs, on newly released data on lipid fractions from the UK Biobank. The sample size of this study (400,000+ study participants) maximizes the discovery power of the MR analysis by improving the precision of the estimates.

Beyond providing support for a causal role of lipid metabolism in ICH in Europeans, our results also support a specific role of LDL-C as the operative lipid trait mediating the observed inverse associations. Previous studies in Asians, who have lower LDL-C levels than Western populations, reported that this lipid fraction is the likely mediator underlying the inverse association between TC and ICH risk. A nested case-control study within the prospective China Kadoorie Biobank involving ~5,000 ICH cases reported that elevated levels of LDL-C were inversely associated with risk of ICH.<sup>12</sup> Mendelian randomization analyses in this study yielded concordant effect estimates, although these were not statistically significant, possibly due to the lower number of SNPs utilized to build the instrument (59 variants) and the European origin of the populations where these lipid-related SNPs had originally been identified. Our results confirm the role of LDL-C as the mediating lipid fraction and provide evidence supporting its role in persons of European



ancestry. We acknowledge that, while concordant in the direction of effect, the point estimates for the MR analysis of LDL-C and ICH risk yielded by the present study (OR 0.59, 95%CI 0.42-0.82) are significantly more extreme than those reported in the China Kadoorie Biobank (OR 0.89, 95%CI 0.62-1.16). The discrepant results could reflect the lower mean age at ICH onset and lower mean LDL-C levels in Chinese compared with Europeans or between-population differences in the distribution of LDL-C which could have biased such comparisons. While the overlap in confidence intervals between European and Chinese studies indicate that differences in the estimates between studies are not statistically significant, precise estimates of effects of LDL-C on ICH risk will require additional analyses in further studies involving larger numbers of ICH cases.

The independent replication of our findings constitutes an important next step to consolidate lipid metabolism as an actionable biological target in ICH. This follow-up studies will be greatly facilitated by increasingly available data from large biobanks and multi-purpose repositories like dbGaP<sup>34</sup> and the European Genome-phenome Archive (EGA).<sup>35</sup> Another important future direction involves the clarification of the pathophysiology underlying the observed association. Histopathological evidence in humans suggests that lower cholesterol concentrations may increase the frailty and permeability of brain vessel walls, triggering arterionecrosis, microaneurysm formation and, ultimately, ICH.<sup>36,37</sup> Because our findings point to an effect that is present for both lobar and deep hemorrhages, it is possible that low lipid levels could work as an effect modifier of the risk conveyed by the underlying small vessel disease responsible for the bleed.

The results of this study prompt questions about the risk-benefit ratio of lowering LDL cholesterol for risk of different stroke types. The China Kadoorie Biobank demonstrated equal and opposite

proportional differences in risk of ischemic stroke and ICH for equivalent differences in LDL-C cholesterol. Because the absolute number of ischemic stroke cases exceeded those of ICH by 4-fold, any beneficial effects of lowering LDL-C on ischemic stroke were likely to outweigh risks of ICH. In light of this evidence, it is reasonable to use extreme caution when evaluating possible applications of these results to clinical decision-making.

An important limitation of our study was the inability to evaluate the effect of other lipid fractions. Alongside the vast majority of related studies, we evaluated TC, LDL-C, HDL-C and triglycerides, the four lipid traits routinely used in clinical practice, and did not account for several other cardiovascular risk-stratifying lipid fractions, such as apolipoprotein levels.<sup>38–40</sup> A second important limitation is the absence of an independent dataset to replicate the association analysis between the lipid-related PRS and ICH risk. The relatively low incidence of ICH in Western populations limits the amount of appropriately ascertained cases within available genetic and location information. Nevertheless, the estimates observed in three different genetic studies of ICH were consistent with each other. In addition, because this study was not intended at risk loci discovery, it could be argued that independent replication for this specific analysis is not strictly needed. Finally, the limited available data on medical history and use of medication in ICH cases precluded any detailed analysis of possible interactions or confounding effects by these variables.

## **SUMMARY**

In conclusion, we report an inverse association between the genetic load of risk alleles for total and LDL-C and risk of ICH in persons of European ancestry. We also found that genetically-instrumented higher total and LDL-C were inversely associated with this same risk. Similar associations were observed for both lobar and nonlobar ICH. Our results support a potential causal role of LDL-C in risk of primary, non-traumatic ICH. **ACKNOWLEDGEMENTS**

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## **AUTHOR CONTRIBUTIONS**

**Conception and design of the study:** GJF, DG, MG, LS, TMG, SK, CDL, DW, JR, KNS and CDA.

**Acquisition and analysis of data:** GJF, EK, JNA, RBN, AL, SM, JC, MS, JFM, DLB, BBW, DLT, JMJ, HS, JJC, IFC, AL, AS, CLP, NHP, CNM and AB.

**Drafting the text and preparing the figures:** GJF, MH, DB, ZC, LLS, RC, RGW and CDA.

#### **POTENTIAL CONFLICTS OF INTEREST**

None.

#### **DATA SHARING**

All data utilized in this study is publicly available through dbGaP

(<https://www.ncbi.nlm.nih.gov/gap/>) and the UK Biobank (<https://www.ukbiobank.ac.uk/>).

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**Table 1. Studies included in this analysis.**

Characteristic	UK Biobank	GOCHA	ISGC ICH Study	GERFHS
<b>Analytical stage</b>	Association Cholesterol level ~ PRS	Association ICH Risk ~ PRS	Association ICH Risk ~ PRS	Association ICH Risk ~ PRS
<b>Study design</b>	Cohort	Case / Control	Case / Control	Case / Control
<b>Study participants</b>	316,428	277 / 248	563 / 523	446 / 490
<b>Age, mean (SD)</b>	68 (8)	73 (10) / 72 (8)	71 (14) / 66 (16)	70 (14) / 68 (13)
<b>Female sex n, %</b>	170,871 (54)	130 (47) / 123 (50)	252 (45) / 255 (49)	211 (47) / 235 (48)
<b>Genotyping platform</b>	Affymetrix UK Biobank array	Illumina HumanHap550	Illumina HumanHap550	Affymetrix 6.0
<b>Genotyped SNPs</b>	820,967	527,508	527,508	580,491
<b>Imputed SNPs</b>	73,355,667	7,965,700	7,965,700	7,967,430

**Acronyms:** UK: United Kingdom; GOCHA: Genetics of Cerebral Hemorrhage with Anticoagulation; ISGC: International Stroke Genetics Consortium; GERFHS: Genetic and Environmental Risk Factors for Hemorrhagic Stroke; ICH: intracerebral hemorrhage; PRS: polygenic risk score; SNPs (single nucleotide polymorphisms); SD: standard deviation.



**Table 2. Association results for 4 PRS with their corresponding trait in the UK Biobank.**

Lipid Trait PRS	Independent SNPS in PRS	UK Biobank Effective sample size	Mean increase in cholesterol trait per 1-SD increase in PRS	Standard error	Variance explained	P
<b>Total Cholesterol</b>	410	316,428	0.33 mmol/L (12.76 mg/dL)	0.0018	9.33%	<1x10 <sup>-100</sup>
<b>LDL Cholesterol</b>	339	315,841	0.24 mmol/L (9.28 mg/dL)	0.0014	8.38%	<1x10 <sup>-100</sup>
<b>HDL Cholesterol</b>	393	289,349	0.11 mmol/L (4.25 mg/dL)	0.0006	8.17%	<1x10 <sup>-100</sup>
<b>Triglycerides</b>	317	316,174	0.22 mmol/L (19.49 mg/dL)	0.0017	4.8%	<1x10 <sup>-100</sup>
<b>Total Cholesterol</b>	410	437,676	0.26 mmol/L (10.05 mg/dL)	0.0017	5.21%	<1x10 <sup>-100</sup>
<b>LDL Cholesterol</b>	339	436,867	0.19 mmol/L (7.35 mg/dL)	0.0013	4.72%	<1x10 <sup>-100</sup>
<b>HDL Cholesterol</b>	393	400,579	0.11 mmol/L (4.25 mg/dL)	0.0005	8.04%	<1x10 <sup>-100</sup>
<b>Triglycerides</b>	317	437,331	0.23 mmol/L (20.37 mg/dL)	0.0015	5%	<1x10 <sup>-100</sup>

**Acronyms:** PRS: polygenic risk score; UK: United Kingdom; SNP: single nucleotide polymorphism; LDL: low-density lipoprotein; HDL: High-density lipoprotein. Conversion of mmol/L to mg/dL: for TC, LDL and HDL 1 mmol/L = 38.67 mg/dL; for triglycerides, 1 mmol/L = 88.57 mg/dL.

\* The primary analysis was restricted to unrelated study participant of genetically-determined European ancestry who were not taking lipid-lowering medications.

\*\* The secondary analysis included all study participants of self-reported European ancestry without any other filters.

**Table 3: Study-specific and metanalysis of logistic regression results modeling ICH risk as a function of different PRS.**

Study	Total Cholesterol		LDL Cholesterol		HDL Cholesterol		Triglycerides	
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
<b>GOCHA</b>	0.95 (0.80 - 1.14)	0.59	0.93 (0.78 - 1.11)	0.41	1.12 (0.94 - 1.34)	0.20	0.95 (0.80 - 1.14)	0.59
<b>ISGC ICH</b>	0.93 (0.82 - 1.05)	0.24	0.88 (0.77 - 0.99)	0.04	1.15 (1.01 - 1.30)	0.03	1.01 (0.89 - 1.14)	0.84
<b>GERFHS</b>	0.88 (0.77 - 1.01)	0.07	0.85 (0.75 - 0.97)	0.02	0.99 (0.86 - 1.12)	0.84	1.19 (1.04 - 1.36)	0.009
<b>Fixed effects Meta-analysis</b>	0.92 (0.85 - 0.99)	0.03	0.88 (0.81 - 0.95)	0.002	1.10 (1.00 - 1.21)	0.06	1.11 (0.98 - 1.23)	0.14
<b>Random Effects Meta-analysis</b>	0.92 (0.84 - 0.99)	0.03	0.88 (0.81 - 0.95)	0.002	1.08 (0.98 - 1.19)	0.13	1.05 (0.93 - 1.20)	0.42
<b>Heterogeneity</b>	I <sup>2</sup> =0%	0.77	I <sup>2</sup> =0%	0.75	I <sup>2</sup> =32%	0.23	I <sup>2</sup> =60%	0.08

**Acronyms:** ICH: intracerebral hemorrhage; PRS (polygenic risk score); LDL: low-density lipoprotein; HDL: high-density lipoprotein; CI: confidence interval; GOCHA: Genetics of Cerebral Hemorrhage with Anticoagulation; ISGC: International Stroke Genetics Consortium; GERFHS: Genetic and Environmental Risk Factors for Hemorrhagic Stroke; FE: Fixed-Effects. RE: Random effects. Het-p: heterogeneity-p for the metanalysis.

**Table 4: Metanalysis of logistic regression results modeling ICH risk as a function of different PRS, excluding *CETP* variants.**

<b>Lipid PRS</b>	<b>OR (95% CI)</b>	<b>P</b>
<b>Total Cholesterol</b>	0.91 (0.84 - 0.99)	0.03
<b>LDL Cholesterol</b>	0.88 (0.81 - 0.96)	0.003
<b>HDL Cholesterol</b>	1.12 (0.99 - 1.21)	0.08
<b>Triglycerides</b>	1.11 (0.98 - 1.23)	0.12

Acronyms: ICH: intracerebral hemorrhage; PRS (polygenic risk score); CI: confidence interval; LDL: low-density lipoprotein; HDL: high-density lipoprotein.

Table 5: Mendelian randomization analysis of genetically instrumented lipid levels and risk of ICH.

Mendelian Randomization Method	Instrument	Total Cholesterol		LDL Cholesterol	
		OR (95%CI)	P	OR (95%CI)	P
Ratio method	Polygenic risk score using on individual level data	0.77 (0.6 - 0.98)	0.03	0.59 (0.42 - 0.82)	0.002
IVW	Multiple SNPs using summary level data	0.84 (0.72 - 0.99)	0.04	0.65 (0.52 - 0.82)	<0.001
Weighted median	Multiple SNPs using summary level data	0.95 (0.72 - 1.30)	0.74	0.79 (0.56 - 1.10)	0.20
MR-Egger (Causal estimates)	Multiple SNPs using summary level data	0.87 (0.66 - 1.20)	0.33	0.72 (0.48 - 1.10)	0.10
MR-Egger (Intercept)	Multiple SNPs using summary level data	1.00 (0.99 - 1.01)	0.81	1.00 (0.98 - 1.01)	0.59

**Acronyms:** ICH: intracerebral hemorrhage; LDL: low-density lipoprotein; OR: odds ratio; CI: confidence interval; SNPs: single nucleotide polymorphisms; IVW: inverse variance weighted.

**Table 6. Sensitivity MR analyses evaluating the effect of genetically-determined LDL cholesterol on risk of different types of ischemic stroke: comparison of results using effect estimates for lipids using GLGC and the UK Biobank.**

<b>Ischemic stroke subtype</b>	<b>Lipid estimates from the GLGC 2019 Valdes-Marquez et al*</b>	<b>Lipid estimates from the GLGC 2018 Hindy et al**</b>	<b>Lipid estimates from the UK Biobank (this study)</b>
<b>Cardioembolic</b>	1.06 (0.84 - 1.33)	0.99 (0.84 - 1.16)	1.05 (0.97 -1.13)
<b>Large artery</b>	1.10 (0.82 - 1.47)	1.28 (1.07 - 1.53)	1.37 (1.24 - 1.51)
<b>Small vessel</b>	1.14 (0.88 - 1.48)	1.09 (0.93 - 1.28)	1.12 (1.03 - 1.22)

**Acronyms:** MR: Mendelian Randomization; LDL: low-density lipoprotein; GLGC: Global Lipids Genetics Consortium; UK: United Kingdom.

\* Neurology. 2019 Mar 12;92(11):e1176-e1187. \*\* Stroke. 2018 Apr;49(4):820-827.

**Table 7: Location-specific results for ICH risk.**

Lipid trait	Lobar ICH n = 539 cases			Nonlobar ICH n = 704 cases		
	OR (95%CI)	P	Metanalysis Heterogeneity P	OR (95%CI)	P	Metanalysis Heterogeneity P
<b>Polygenic risk score analysis *</b>						
<b>Total cholesterol</b>	0.89 (0.80 - 0.99)	0.03	0.42	0.94 (0.85 - 1.08)	0.20	0.96
<b>LDL cholesterol</b>	0.81 (0.73 - 0.89)	<0.001	0.96	0.90 (0.82 - 0.99)	0.04	0.99
<b>Mendelian randomization analysis **</b>						
<b>Total cholesterol</b>	0.70 (0.51 - 0.96)	0.03	-	0.73 (0.62 - 1.11)	0.20	-
<b>LDL cholesterol</b>	0.41 (0.27 - 0.64)	<0.001	-	0.66 (0.44 - 0.97)	0.04	-

**Acronyms:** ICH: Intracerebral hemorrhage; PRS: polygenic risk score; OR: odds ratio; CI: confidence intervals; LDL: low-density lipoprotein.

\* Inverse variance fixed effects metanalysis of logistic regression results for ICH across GOCHA, ISGC ICH GWAS and GERFHS. For each study, the logistic regression model used ICH risk as the dependent variable and a polygenic risk score as the independent variable, adjusting for age, sex and 4 principal components. The PRS were normalized and entered to the model as a continuous predictor. The OR represents the change in the odds of ICH per each additional standard deviation of the PRS.

\*\* Mendelian randomization results of genetically instrumented cholesterol levels using a polygenic risk score as the instrument. Each lipid fraction-specific analysis utilized the ratio method, taking the effect estimates for ICH ~ PRS (numerator) and lipid level ~ PRS (denominator).

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## Supplementary Material

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### Genetically Elevated LDL Associates with Lower Risk of Intracerebral Hemorrhage

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Supplementary Table 1: SNPs used in the polygenic risk score of total cholesterol.

Chr	Pos	rsid	EA	NEA	EAF	Beta	se	P	SNP Present in Study*
1	10556447	rs648324	T	G	0.6982	0.0148	0.0026	8.88E-09	++++
1	16515805	rs6656611	T	C	0.459	-0.0122	0.0022	1.43E-08	++++
1	23766233	rs1077514	T	C	0.8707	0.0301	0.0052	6.4E-09	++++
1	25760920	rs11802413	T	C	0.5369	0.0287	0.0035	1.576E-14	++++
1	28298951	rs6699701	T	C	0.3123	-0.0148	0.0023	2.14E-10	++++
1	55486064	rs2479394	G	A	0.285	0.0359	0.0039	1.997E-18	++++
1	55496039	rs11206510	T	C	0.8456	0.069	0.0048	1.128E-41	++++
1	55504650	rs2479409	G	A	0.3325	0.054	0.004	2.025E-39	++++
1	55509872	rs4927193	T	C	0.8694	0.0283	0.0054	4.119E-08	++++
1	55516004	rs11206514	A	C	0.6108	0.0355	0.0039	2.329E-18	++++
1	55517344	rs572512	T	C	0.3456	0.0361	0.0045	3.279E-17	++++
1	55518467	rs2495477	A	G	0.625	0.052		3.3E-21	++++
1	55518752	rs7552841	T	C	0.3654	0.032	0.0041	3.582E-14	++++
1	55523984	rs584626	T	C	0.8153	0.0437	0.0047	3.881E-20	++++
1	55662680	rs4926670	C	T	0.8865	0.0636	0.0058	1.616E-26	+++
1	55719166	rs7551981	T	G	0.595	0.0358	0.0037	7.497E-22	++++
1	55730327	rs6662286	C	T	0.90633	0.0691	0.007	1.564E-21	++++
1	55743519	rs1874776	C	T	0.7823	0.0339	0.0042	1.985E-14	++++
1	55808143	rs207145	T	C	0.8905	0.042	0.0055	1.574E-13	++++
1	62833553	rs6587970	G	A	0.438	0.0286	0.0046	1.235E-09	++++
1	62995263	rs12039115	C	T	0.8905	0.0563	0.0055	4.341E-24	++++
1	63028198	rs12749263	C	T	0.2573	0.0357	0.0041	1.338E-16	++++
1	63107526	rs995000	T	C	0.3454	-0.0618	0.0028	6.32E-112	++++
1	63193972	rs2149116	A	G	0.3179	0.0407	0.0052	5.844E-14	++++
1	63257994	rs10493329	A	G	0.8628	0.0452	0.0048	1.005E-18	++++
1	63358816	rs7512480	T	C	0.4802	0.0339	0.0036	2.639E-19	++++
1	92993807	rs6603981	T	C	0.8061	0.0351	0.0043	7.846E-15	++++
1	109705022	rs676385	G	A	0.719	0.0254	0.0042	1.442E-09	++++
1	109727284	rs648673	G	C	0.8852	0.0411	0.0055	1.308E-13	++++
1	109778577	rs658092	C	T	0.781	0.0282	0.0044	7.44E-10	++++
1	109782003	rs611945	A	G	0.7375	0.0229	0.0039	1.284E-08	++++
1	109783261	rs11102964	T	C	0.8325	0.0405	0.0047	6.633E-18	++++
1	109789795	rs585362	T	C	0.8813	0.0703	0.0053	1.155E-38	++++
1	109807099	rs6689614	A	G	0.4551	0.0507	0.0036	2.76E-41	++++
1	109810981	rs17035630	A	G	0.128	0.0402	0.0058	2.155E-12	++++
1	109813719	rs17035665	C	T	0.8153	0.0594	0.0057	3.434E-26	++++
1	109817192	rs7528419	A	G	0.7715	0.1364	0.0031	1E-300	++++
1	109827253	rs672569	G	A	0.843	0.1248	0.0079	1.189E-51	++++
1	109832283	rs655246	G	A	0.4947	0.0439	0.0036	8.839E-33	++++
1	109838918	rs629001	T	C	0.93272	0.0847	0.0076	1.04E-26	++++
1	109839896	rs7515901	C	T	0.8179	0.0407	0.005	5.841E-14	++++
1	109845100	rs1278286	T	G	0.1438	0.0301	0.0059	2.34E-08	----
1	110014170	rs12136063	A	G	0.6702	0.0248	0.0039	2.194E-09	++++
1	110109039	rs518076	A	G	0.93008	0.0387	0.006	5.058E-10	++++
1	110169190	rs865774	C	T	0.8391	0.0328	0.0053	1.89E-09	++++
1	110198727	rs1010167	G	C	0.4156	0.0208	0.0038	1.094E-08	++++
1	113190807	rs17030613	A	C	0.8033	0.0128	0.0023	0.000000021	++++
1	120257576	rs477992	A	G	0.3181	-0.014	0.0025	1.85E-08	++++
1	220970028	rs2642438	G	A	0.7454	0.037	0.004	1.283E-18	++++
1	220974202	rs2807837	A	G	0.90765	0.0324	0.0066	4.088E-08	++++
1	220977650	rs2642420	C	A	0.847	0.0412	0.0067	2.087E-09	++++
1	220998913	rs7544735	A	G	0.3034	0.0273	0.0039	4.444E-12	++++



1	234848763	rs10910490	A	G	0.1609	0.0398	0.0049	2.958E-15	++++
1	234853059	rs556107	T	C	0.5912	0.0369	0.003	1.427E-35	++++
1	236718620	rs1126627	T	C	0.3758	0.0118	0.0019	9.42E-10	+++
2	17930195	rs6761104	A	G	0.2063	-0.0194	0.0034	1.04E-08	++++
2	20371613	rs1107851	T	C	0.5501	0.0243	0.0035	2.903E-10	++++
2	20985414	rs11679386	C	T	0.128	0.0393	0.0059	2.226E-11	----
2	21092106	rs10178381	A	T	0.8879	0.0557	0.0064	8.24E-18	++++
2	21099871	rs6729410	A	G	0.6451	0.036	0.0038	5.032E-20	++++
2	21112689	rs12710745	A	G	0.6042	0.0405	0.0037	5.593E-28	++++
2	21121130	rs4971538	G	T	0.1082	0.0523	0.0058	3.487E-17	++++
2	21133883	rs10198175	A	G	0.08443	0.0635	0.0061	2.812E-24	++++
2	21186121	rs2337381	A	C	0.2256	0.0541	0.0039	1.535E-39	++++
2	21196346	rs10207315	T	G	0.223	0.0453	0.0041	4.335E-25	++++
2	21205502	rs4564803	G	T	0.7414	0.0502	0.0041	1.742E-33	++++
2	21217490	rs13392272	T	C	0.4129	0.0732	0.0035	5.669E-89	++++
2	21219001	rs6725189	G	T	0.7652	0.0548	0.0043	3.701E-35	++++
2	21228827	rs1801701	T	C	0.07916	0.0497	0.0062	8.298E-15	++++
2	21249716	rs12691202	C	T	0.94855	0.1031	0.0109	1.426E-22	----
2	21251040	rs570877	G	T	0.8879	0.0864	0.0063	2.086E-39	++++
2	21263900	rs1367117	A	G	0.2876	0.0995	0.0038	2.48E-139	++++
2	21270751	rs17398765	G	A	0.0686	0.0734	0.0073	9.899E-24	----
2	21286057	rs515135	C	T	0.7823	0.1238	0.0046	6.38E-151	++++
2	21389659	rs4635554	G	T	0.3061	0.0691	0.004	5.065E-63	++++
2	21451687	rs35239705	G	A	0.7704	0.0473	0.0061	6.753E-14	++++
2	21474487	rs312046	T	C	0.2968	0.0406	0.0038	5.832E-24	++++
2	21502727	rs13396400	G	A	0.4446	0.0294	0.0036	3.12E-15	++++
2	21527036	rs6739502	A	G	0.4947	0.0315	0.0035	5.471E-20	++++
2	21769639	rs2194562	A	G	0.09367	0.0419	0.0059	5.581E-11	+++
2	27730940	rs1260326	T	C	0.3798	0.0748	0.0028	2.92E-160	++++
2	27731212	rs3817588	T	C	0.7889	0.0438	0.0044	2.906E-20	+++
2	27895073	rs2178198	T	C	0.1306	0.0393	0.0053	3.373E-13	++++
2	27932587	rs6727388	G	A	0.2243	0.035	0.0044	4.274E-14	++++
2	27951658	rs867282	C	T	0.7784	0.0321	0.0043	8.647E-13	++++
2	28443050	rs7349418	C	T	0.4472	0.0201	0.0036	4.424E-08	++++
2	44022970	rs1025447	C	T	0.1583	0.0344	0.0046	3.492E-12	++++
2	44043135	rs10208987	T	G	0.91029	0.0439	0.0065	6.529E-11	++++
2	44057102	rs4148177	G	A	0.5673	0.0364	0.0049	1.009E-12	++++
2	44073881	rs6544713	T	C	0.2942	0.0773	0.004	1.685E-81	++++
2	44074000	rs4953023	G	A	0.91557	0.1249	0.0072	1.318E-63	++++
2	44075217	rs17424122	A	T	0.06596	0.0653	0.0087	5.176E-14	----
2	44099582	rs4148218	G	A	0.8087	0.0385	0.0045	8.218E-18	++++
2	46166321	rs12712955	A	G	0.5321	0.0135	0.0024	2.05E-08	++++
2	63149557	rs2710642	G	A	0.349	-0.027	NA	0.000000022	++++
2	65652156	rs7572922	T	C	0.3733	-0.0171	0.0028	6.177E-10	++++
2	70524142	rs14234	A	G	0.5472	-0.0131	0.0019	1.89E-11	++++
2	111600519	rs13395354	T	C	0.1842	0.0159	0.0027	2.1E-09	++++
2	118797742	rs72838078	G	T	0.92	0.054	NA	1.8E-10	----
2	121306440	rs17050272	A	G	0.389	-0.0181	0.0028	1.26E-10	++++
2	135762344	rs16831243	T	C	0.1807	0.0378	0.0053	1.842E-12	++++
2	136608646	rs4988235	G	A	0.4763	0.0308	0.004	3.975E-14	++++
2	158437683	rs4377290	T	C	0.5033	0.0174	0.0026	2.3E-11	++++
2	163110536	rs2111485	A	G	0.4643	0.0134	0.0022	6.06E-10	++++
2	169830798	rs10177080	A	G	0.5435	-0.0189	0.0027	2.594E-12	++++
2	203328933	rs2350809	T	C	0.879	-0.039	NA	0.00000004	----
2	203519264	rs72926986	T	G	0.278	-0.0326	0.003	2.347E-27	++++
2	203532304	rs11694172	G	A	0.2164	0.0277	0.0041	1.951E-09	++++

2	203708307	rs934287	G	A	0.8179	0.0278	0.0046	0.000000005	++++
2	234668570	rs887829	C	T	0.7032	0.0228	0.0037	1.938E-09	++++
2	234679384	rs11563251	T	C	0.1253	0.0368	0.0059	1.266E-09	++++
3	12268604	rs7641325	A	G	0.4591	-0.0225	0.0026	1.118E-17	++++
3	12314512	rs2960420	G	C	0.3707	0.024	0.0039	1.085E-08	++++
3	12323413	rs2920500	A	G	0.5501	0.0243	0.0036	9.402E-11	++++
3	12461615	rs709156	G	A	0.6953	0.0294	0.0038	7.067E-13	++++
3	12489342	rs17819328	G	T	0.4261	0.0277	0.0037	4.449E-13	++++
3	12502955	rs709167	G	T	0.4446	0.0227	0.0037	7.972E-10	++++
3	12674199	rs11709504	T	C	0.7982	0.0322	0.0045	1.398E-12	++++
3	32533010	rs7640978	T	C	0.1604	-0.033	0.004	2.431E-16	++++
3	58301460	rs9985315	A	G	0.9179	0.0272	0.0047	9.165E-09	++++
3	64706499	rs9870322	T	C	0.5997	0.0141	0.0026	3.82E-08	++++
3	119529113	rs3732356	T	G	0.8483	-0.0291	0.0046	2.31E-10	++++
3	122176238	chr3:122176238:D	TG	T	0.688	-0.028	NA	0.000000014	----
3	122258056	rs9825383	A	G	0.6077	0.0152	0.0028	4.156E-08	++++
3	142625778	rs1470121	A	G	0.32	-0.0168	0.0026	1.35E-10	++++
3	160223172	rs721023	A	G	0.5473	-0.0198	0.0026	7.44E-14	++++
4	3434885	rs6818397	T	G	0.4129	0.0254	0.0039	9.51E-11	++++
4	3452345	rs59950280	A	G	0.3883	0.0198	0.0029	4.102E-12	++++
4	3473139	rs6831256	G	A	0.409	0.023	0.0037	3.361E-10	++++
4	40428010	rs278981	T	C	0.2521	-0.0127	0.0021	1.31E-09	++++
4	69338311	rs969114	A	G	0.5722	0.029	0.0027	1.341E-26	++++
4	88160140	rs10029254	T	C	0.2088	0.0264	0.0035	2.059E-14	++++
4	100260545	rs62307295	A	C	0.0958	0.0277	0.0046	2.467E-09	----
4	103198082	rs13135092	A	G	0.919	0.052	NA	7.5E-10	----
5	52193237	rs870992	A	G	0.9149	-0.0251	0.004	2.34E-10	++++
5	72014569	rs3010276	A	G	0.1966	-0.0148	0.0026	1.58E-08	++++
5	74274675	rs4382144	A	G	0.5871	0.0285	0.0035	2.365E-15	++++
5	74405097	rs4361493	G	A	0.4077	0.042	0.0037	1.767E-29	++++
5	74413713	rs2035191	C	T	0.186	0.0556	0.0045	1.745E-32	++++
5	74620377	rs3857388	C	T	0.128	0.0368	0.0057	3.279E-09	++++
5	74646878	rs11742194	T	C	0.1029	0.056	0.0058	3.255E-21	++++
5	74656539	rs12916	T	C	0.6225	-0.0556	0.0027	6.54E-94	++++
5	74745228	rs10070207	T	G	0.2296	0.0464	0.0043	3.147E-24	++++
5	74928883	rs253392	G	T	0.2625	0.0436	0.004	2.894E-25	++++
5	74929312	rs16872670	A	G	0.05673	0.0525	0.0081	8.147E-10	++++
5	74971374	rs10515214	G	A	0.1821	0.0456	0.0048	2.803E-20	++++
5	75020023	rs17564079	G	T	0.09499	0.0438	0.0067	5.162E-10	----
5	75034387	rs7715806	T	C	0.3879	0.0355	0.0037	1.825E-20	++++
5	75202811	rs1525764	A	T	0.2876	0.0237	0.004	2.871E-08	++++
5	122855416	rs4530754	A	G	0.5818	0.0228	0.0035	1.678E-09	++++
5	131408842	rs1469149	A	C	0.586	0.0148	0.0027	2.392E-08	++++
5	131804045	rs2522061	G	T	0.792	0.031	NA	0.000000041	++++
5	156273481	rs4704810	A	G	0.3826	0.0219	0.0036	2.888E-09	++++
5	156376703	rs6873053	G	A	0.91557	0.0396	0.0063	8.789E-10	++++
5	156392248	rs12517431	T	C	0.6045	0.0365	0.0027	7.629E-42	++++
5	156430705	rs1546288	A	G	0.3879	0.0341	0.0036	2.985E-20	++++
5	156465256	rs6878732	T	A	0.8206	0.0378	0.0044	5.071E-17	++++
5	156484626	rs4704839	T	A	0.8483	0.0378	0.0052	1.544E-12	++++
5	156485186	rs67960962	C	T	0.5317	0.0353	0.0051	4.222E-11	++++
6	16124560	rs6459450	T	C	0.672	0.04	NA	5.5E-16	++++
6	16162508	rs7742144	T	C	0.7441	0.0238	0.004	2.578E-08	++++
6	26093141	rs1800562	G	A	0.939	0.088	NA	9.3E-20	++++
6	27122444	rs71559014	A	G	0.9285	0.0331	0.0056	3.643E-09	----
6	34546560	rs2814982	C	T	0.8931	0.0441	0.0057	3.678E-15	++++

6	35057331	rs3822921	G	A	0.8588	0.0316	0.0054	1.984E-09	----
6	37038432	rs913499	A	G	0.4618	0.0146	0.0021	8.86E-12	++++
6	39250837	rs2758886	A	G	0.285	0.0232	0.0039	3.008E-08	++++
6	53497222	rs1326543	A	G	0.756	-0.0144	0.0025	4.58E-09	++++
6	116354591	rs11153594	C	T	0.6082	0.029	0.0036	1.266E-14	++++
6	135411228	rs9376090	T	C	0.745	0.043	NA	1.9E-16	++++
6	160402705	rs6917747	A	G	0.1398	0.0324	0.0052	5.993E-09	++++
6	160491741	rs3798180	A	G	0.6227	0.0254	0.0036	8.803E-12	++++
6	160543148	rs12208357	C	T	0.925	-0.063	NA	4.9E-13	----
6	160567928	rs3798167	G	T	0.7902	0.0328	0.0045	3.75E-11	++++
6	160572866	rs622342	C	A	0.3549	0.0345	0.0038	4.579E-18	++++
6	160575366	rs11753995	A	G	0.1464	0.0489	0.0048	1.839E-23	----
6	160644012	rs3127575	T	C	0.1082	0.0372	0.0057	1.044E-10	++++
6	160737140	rs378479	G	C	0.4789	0.0257	0.0035	1.82E-11	++++
6	160863532	rs2048327	C	T	0.3509	0.0227	0.0036	9.481E-09	++++
6	160954505	rs3124785	A	G	0.3087	0.0374	0.0057	1.333E-10	++++
6	160998148	rs3798221	G	T	0.777	0.0317	0.0043	8.326E-13	++++
6	161005389	rs191555775	A	T	0.901	0.053	NA	1.2E-11	----
6	161010118	rs10455872	A	G	0.9351	-0.0762	0.0057	4.082E-41	----
6	161018174	rs7770628	C	T	0.4485	0.0245	0.0036	8.596E-11	++++
6	161108536	rs6935921	T	C	0.7361	0.0254	0.0041	1.833E-09	++++
7	1067906	rs2362529	T	C	0.7754	0.0284	0.0032	8.086E-19	++++
7	1083777	rs1997243	G	A	0.1306	0.0332	0.005	2.719E-10	++++
7	21485397	rs2390536	A	G	0.3681	0.0221	0.0037	7.744E-09	++++
7	21534152	rs7811417	C	T	0.6675	0.0217	0.0037	2.103E-08	++++
7	21584243	rs2285949	A	G	0.4828	0.0256	0.0036	1.185E-11	----
7	21611399	rs66476925	C	G	0.1868	0.0316	0.0036	8.695E-19	++++
7	21684768	rs940434	C	T	0.2929	0.021	0.0038	4.007E-08	++++
7	25992323	chr7:25992323:l	A	AAGGCC	0.841	-0.039	NA	3.5E-09	----
7	44582331	rs2073547	G	A	0.1939	0.0456	0.0047	3.83E-21	++++
7	44600695	rs217386	G	A	0.5923	0.0338	0.0036	1.764E-18	++++
7	44602589	rs7791240	C	T	0.09103	0.0419	0.0062	8.389E-11	----
7	73026151	rs13234378	A	T	0.8858	0.0235	0.0043	4.486E-08	++++
7	87076587	rs1014283	A	C	0.275	-0.0148	0.0026	1.62E-08	++++
7	92408370	rs445	T	C	0.1345	0.0159	0.0028	9.52E-09	++++
8	9171735	rs713286	T	C	0.92216	0.0507	0.0069	1.419E-12	++++
8	9181395	rs2169387	A	G	0.1311	-0.053	0.0041	7.2E-39	++++
8	9185081	rs2126260	C	T	0.7942	0.0329	0.0042	5.027E-14	++++
8	9194172	rs732839	A	G	0.2388	0.0269	0.0043	1.239E-09	++++
8	9200042	rs1461728	A	G	0.3377	0.0223	0.0037	3.203E-09	++++
8	9206069	rs10102352	G	A	0.6161	0.0399	0.005	7.281E-14	++++
8	18255709	rs1961456	G	A	0.2916	0.0305	0.0039	3.458E-16	++++
8	21937667	rs6557781	T	C	0.1836	-0.0196	0.0029	8.87E-12	++++
8	55421614	rs10102164	A	G	0.1741	0.0301	0.0043	4.596E-11	++++
8	59392324	rs9297994	A	G	0.6903	-0.0363	0.003	1.294E-33	++++
8	74881674	rs7013120	A	G	0.2637	-0.0139	0.0024	3.73E-09	++++
8	116663898	rs2737252	G	A	0.7441	0.0331	0.0039	1.634E-16	++++
8	126449406	rs17405319	T	C	0.1636	0.0429	0.0049	1.805E-16	++++
8	126465305	rs17730649	A	C	0.4024	0.0433	0.0036	7.729E-30	++++
8	126500350	rs8180991	G	C	0.2309	0.0483	0.0043	3.316E-27	++++
8	126506694	rs112875651	G	A	0.62	0.08	NA	1.9E-57	++++
8	126507389	rs2954038	A	C	0.7181	-0.0776	0.003	6.5E-148	++++
8	126514676	rs7012891	C	T	0.2296	0.0254	0.0041	5.424E-09	++++
8	145022657	rs7832643	T	G	0.405	0.0289	0.0037	3.121E-13	++++
9	2640759	rs3780181	A	G	0.8776	0.0358	0.0046	1.182E-14	++++
9	15305378	rs581080	C	G	0.8206	0.0377	0.0047	1.022E-13	++++

9	19212560	rs13300056	T	C	0.0825	0.0392	0.0064	9.997E-10	++++
9	22088094	rs10738607	A	G	0.5451	0.0129	0.0021	1.62E-09	++++
9	107562804	rs2230808	C	T	0.7889	0.031	0.0042	1.476E-13	++++
9	107588777	rs4149311	T	C	0.1069	0.0456	0.0055	1.173E-15	++++
9	107629104	rs4743764	T	C	0.6082	0.0416	0.006	9.552E-14	++++
9	107647019	rs11789603	T	C	0.08971	0.0427	0.0062	1.439E-11	++++
9	107651174	rs2275543	T	C	0.90633	0.0641	0.0058	7.967E-26	++++
9	107664301	rs1883025	C	T	0.7573	0.0671	0.0042	5.749E-53	++++
9	107668064	rs3905001	C	G	0.2744	0.0311	0.0052	2.213E-08	++++
9	107668886	rs2777794	A	T	0.4578	0.0284	0.0039	9.737E-13	++++
9	117144795	rs2763193	T	C	0.5751	0.0156	0.0028	3.488E-08	++++
9	136132873	rs8176720	T	C	0.6636	0.0257	0.0037	5.568E-12	++++
9	136149722	rs630014	G	A	0.5343	0.0295	0.0036	6.38E-16	++++
9	136149830	rs532436	A	G	0.181	0.068	0.0034	1.499E-87	++++
9	136155444	rs633862	T	C	0.5739	0.0244	0.0036	1.2E-11	++++
9	136328657	rs3124765	T	C	0.1517	0.0353	0.0061	1.384E-08	----
10	17268839	rs3758413	T	C	0.6103	-0.0222	0.0027	2.259E-16	++++
10	45988597	rs10900221	A	G	0.2731	0.0255	0.0041	7.963E-09	++++
10	94839642	rs2068888	A	G	0.4266	-0.0222	0.0027	6.551E-17	++++
10	113933886	rs2255141	A	G	0.298	0.046	NA	1.1E-19	++++
10	114048792	rs2148489	T	C	0.7757	0.028	0.0042	2.366E-10	++++
11	18656271	rs10832962	T	C	0.719	0.0315	0.0039	1.539E-14	++++
11	48018355	rs4752805	G	A	0.2467	0.0251	0.0041	1.617E-09	++++
11	61548874	rs174532	A	G	0.2929	0.0331	0.0041	9.511E-16	++++
11	61597972	rs1535	A	G	0.6372	0.0497	0.0037	8.624E-39	++++
11	61601908	rs2845573	A	G	0.8971	0.051	0.0059	1.132E-17	++++
11	61624414	rs174602	T	C	0.7929	0.0334	0.0056	2.346E-09	++++
11	61636126	rs11230815	C	G	0.8694	0.0361	0.0061	1.854E-08	++++
11	61641542	rs174450	T	G	0.529	0.0327	0.0036	2.923E-18	++++
11	75474195	rs72997616	A	C	0.1232	-0.0243	0.0044	4.112E-08	++++
11	77973980	rs2511158	T	C	0.1622	-0.0255	0.0033	1.41E-14	++++
11	116525730	rs480823	C	T	0.1042	0.0536	0.0062	9.807E-19	----
11	116526322	rs486394	C	A	0.2942	0.0307	0.004	2.704E-14	++++
11	116529442	rs11820504	C	T	0.2032	0.0266	0.0045	1.699E-09	++++
11	116584987	rs4938303	C	T	0.2757	0.0414	0.0039	5.576E-25	++++
11	116624703	rs180326	G	T	0.3628	0.0443	0.0039	2.703E-29	++++
11	116660686	rs2266788	G	A	0.09103	0.1138	0.0071	3.97E-54	++++
11	116662407	rs3135506	C	G	0.071	0.1053	0.0051	2.14E-93	++++
11	116669828	rs11216137	G	A	0.92216	0.0742	0.0077	5.165E-22	++++
11	116691634	rs5110	A	C	0.06464	0.0857	0.0138	1.094E-09	----
11	116722041	rs10047462	G	T	0.1306	0.0657	0.0061	9.247E-29	++++
11	116724232	rs888246	T	C	0.08179	0.0617	0.0061	1.035E-23	++++
11	116741572	rs533556	A	C	0.3694	0.0433	0.0037	2.869E-29	++++
11	116826643	rs12270837	A	C	0.94195	0.056	0.0074	2.298E-13	++++
11	118480285	rs12225399	C	G	0.3783	0.0176	0.0027	1.414E-10	++++
11	122534504	rs7117842	C	T	0.3892	0.0294	0.0036	2.479E-15	++++
11	122563338	rs11602361	G	A	0.6385	0.0243	0.0036	3.15E-11	++++
11	126228000	rs59379014	C	T	0.926	-0.072	NA	1.7E-13	++++
11	126243952	rs11220462	G	A	0.88	-0.06	NA	1.2E-15	++++
12	9082581	rs4883201	A	G	0.8865	0.035	0.0056	1.742E-09	----
12	25408464	rs12320328	A	G	0.9004	0.0216	0.0039	0.000000035	++++
12	109939641	rs2241212	A	T	0.5581	0.0152	0.0027	1.521E-08	++++
12	112007756	rs653178	T	C	0.5505	0.0273	0.0028	2.082E-22	++++
12	112194976	rs737280	C	T	0.2586	0.0214	0.004	4.954E-08	++++
12	121416650	rs1169288	A	C	0.6937	-0.0344	0.003	1.563E-30	++++
12	123867994	rs28516750	A	G	0.8985	-0.0303	0.0043	2.37E-12	++++

12	125261593	rs838880	T	C	0.6042	-0.0174	0.0028	3.158E-10	++++
13	41609047	rs17532301	A	G	0.0674	-0.0304	0.0043	2.72E-12	++++
13	50198158	rs4942859	A	G	0.5421	-0.0133	0.0024	2.86E-08	++++
13	111025118	rs4773173	A	G	0.657	0.0161	0.0022	4.93E-13	++++
14	24872209	rs6573778	T	C	0.471	0.0263	0.0039	2.958E-11	++++
14	64235556	rs7157785	T	G	0.2401	0.0206	0.0032	1.656E-10	++++
15	58549619	rs7178779	G	T	0.4855	0.0234	0.0043	3.757E-08	++++
15	58579956	rs2899624	A	G	0.8456	0.0382	0.0051	2.686E-12	++++
15	58646332	rs4622454	T	C	0.3641	0.0234	0.0036	2.109E-10	++++
15	58679668	rs7350789	A	G	0.3451	0.0522	0.0028	3.564E-78	++++
15	58683227	rs12185071	T	C	0.1412	0.0439	0.0052	1.158E-14	++++
15	58684478	rs17821274	T	C	0.3456	0.0276	0.0037	2.408E-13	++++
15	58710627	rs11071380	C	A	0.5778	0.0419	0.0039	1.06E-24	++++
15	58712973	rs11858279	C	T	0.2639	0.0431	0.0044	1.782E-21	++++
15	58721614	rs11071381	G	A	0.5106	0.0286	0.0056	4.867E-08	++++
15	58723479	rs1077834	C	T	0.2111	0.0652	0.0043	3.283E-47	++++
15	63793873	rs11636917	T	C	0.6695	-0.0206	0.003	3.308E-12	++++
16	56985555	rs12448528	G	A	0.7731	0.0461	0.005	8.336E-18	++++
16	56991363	rs183130	T	C	0.3073	0.0549	0.0028	1.012E-84	++++
16	57003146	rs11076174	T	C	0.918	0.048	NA	0.000000027	++++
16	57006590	rs7499892	C	T	0.821	0.067	NA	1.2E-27	++++
16	57015091	rs5880	G	C	0.94063	0.0622	0.0092	3.655E-12	----
16	57017474	rs289741	G	A	0.3219	0.0296	0.004	3.267E-11	++++
16	67879400	rs3809630	A	G	0.1306	0.0314	0.0053	1.544E-08	++++
16	71583859	rs2434885	C	T	0.801	0.043	NA	1.2E-13	++++
16	71869520	rs8044335	C	A	0.4446	0.0288	0.0035	1.749E-14	++++
16	71983664	rs1549292	G	T	0.1425	0.0314	0.0052	1.415E-08	++++
16	72009676	rs12931964	G	T	0.1649	0.0356	0.0049	2.236E-11	----
16	72019948	rs4788589	A	T	0.7889	0.0296	0.0043	1.592E-10	++++
16	72042682	rs3213422	A	C	0.5026	0.0277	0.0037	7.455E-13	++++
16	72108093	rs2000999	A	G	0.1847	0.0617	0.0044	6.804E-41	++++
16	72114002	rs217181	C	T	0.7876	0.0572	0.0047	8.074E-31	++++
16	72144174	rs9302635	T	C	0.8232	0.0366	0.0047	1.422E-14	++++
16	72243624	rs8060878	G	A	0.4367	0.0287	0.0035	1.77E-13	++++
16	72312727	rs12921986	G	A	0.06332	0.0468	0.007	2.416E-10	++++
16	72800567	rs8044476	G	A	0.1293	0.0317	0.0051	5.316E-09	++++
17	7080316	rs55714927	C	T	0.821	0.034	NA	0.000000021	++++
17	7091650	rs314253	T	C	0.6649	0.0233	0.0037	2.808E-10	++++
17	8219478	rs2270445	A	G	0.4596	-0.0153	0.0027	2.469E-08	++++
17	18125877	rs62072497	A	G	0.1882	0.0208	0.0034	1.172E-09	++++
17	28574177	rs7214248	A	G	0.3149	-0.0153	0.0025	7.23E-10	++++
17	37807698	rs9972882	C	A	0.7401	0.0243	0.004	4.158E-08	++++
17	45312813	rs4968255	T	C	0.285	0.0275	0.0048	2.061E-08	++++
17	45391804	rs7225700	C	T	0.6728	0.0258	0.0037	1.075E-10	++++
17	45425115	rs7206971	G	A	0.515	-0.043	NA	1.7E-20	++++
17	67150176	rs2886232	T	C	0.1201	0.0358	0.0062	3.874E-08	++++
17	76392144	rs17561950	A	G	0.4593	0.0196	0.0027	4.581E-13	++++
18	47007234	rs2156499	G	A	0.7111	0.0262	0.0039	1.018E-10	++++
18	47130342	rs17712928	A	G	0.3325	0.0217	0.0037	1.37E-08	++++
18	47138066	rs7241596	T	C	0.3417	0.0274	0.0037	1.315E-13	++++
18	47147746	rs1105654	A	G	0.628	0.0381	0.0037	4.295E-23	+++-
18	47148299	rs7229377	T	C	0.2216	0.0362	0.0046	4.68E-15	++++
18	47149371	rs7235005	A	G	0.4987	0.0244	0.0036	1.515E-11	++++
18	47166101	rs11659960	C	G	0.2493	0.0267	0.0041	6.355E-11	++++
18	47176911	rs4939887	G	A	0.3958	0.0267	0.0036	4.219E-14	++++
18	47181668	rs2156552	T	A	0.8219	0.057	0.0047	1.247E-31	++++

18	47187977	rs1943979	A	G	0.6372	0.0298	0.0036	6.285E-16	++++
18	47258695	rs4939890	G	A	0.91293	0.0428	0.0061	4.068E-12	++++
18	47398254	rs9951669	G	A	0.2177	0.027	0.0043	1.09E-09	++++
18	47457559	rs1787328	C	T	0.4617	0.0268	0.0038	3.702E-12	++++
19	10686123	rs10403668	G	A	0.8377	0.0392	0.005	2.407E-13	++++
19	10742170	rs2288904	G	A	0.7665	0.0409	0.0045	3.972E-17	++++
19	10802792	rs13465	G	A	0.9314	0.084	0.0082	2.47E-23	++++
19	10904689	rs1610095	G	C	0.558	0.051	NA	2.5E-22	++++
19	10950125	rs11881156	C	T	0.8377	0.0689	0.0048	8.708E-44	++++
19	11023434	rs1529711	T	C	0.1609	0.0315	0.0049	1.596E-10	++++
19	11114352	rs12983316	G	A	0.1689	0.0402	0.005	4.014E-15	----
19	11146499	rs3786721	T	C	0.4617	0.0366	0.0037	3.123E-21	++++
19	11161537	rs3786722	C	A	0.7573	0.0613	0.0042	2.252E-45	++++
19	11190764	rs36005514	A	G	0.0752	0.0538	0.0091	1.298E-08	----
19	11196886	rs8106503	T	C	0.8354	0.1334	0.0037	1.64E-281	++++
19	11206530	rs8110695	T	A	0.8206	0.0891	0.0048	2.311E-76	----
19	11227602	rs688	T	C	0.4472	0.0416	0.0036	1.648E-28	++++
19	11242307	rs2738464	C	G	0.8747	0.0364	0.0059	2.418E-08	++++
19	11243445	rs5742911	A	G	0.7322	0.0468	0.0055	3.521E-16	++++
19	11266584	rs892114	A	G	0.2269	0.0294	0.0045	6.524E-10	++++
19	11275139	rs7188	C	A	0.3259	0.0426	0.0042	6.499E-23	++++
19	11284302	rs379309	C	T	0.5026	0.0266	0.0038	4.463E-11	++++
19	11392431	rs376642	C	T	0.715	0.0246	0.0039	2.675E-11	++++
19	11425200	rs17699238	G	T	0.2005	0.0246	0.0046	3.347E-08	++++
19	18577873	rs4808802	C	G	0.215	0.0251	0.0044	3.266E-08	++++
19	19103986	rs3810444	T	A	0.94459	0.0648	0.0081	9.406E-15	----
19	19288960	rs3819578	C	T	0.8747	0.0544	0.0076	1.744E-12	++++
19	19407718	rs10401969	T	C	0.92876	0.1369	0.007	4.126E-77	++++
19	19525792	rs2965185	T	C	0.7256	0.042	0.0039	2.465E-23	++++
19	19738554	rs873870	G	A	0.4802	0.0216	0.0038	1.666E-08	++++
19	19841752	rs12608822	C	T	0.94855	0.0901	0.009	9.137E-23	----
19	44880360	rs1594895	T	C	0.8179	0.0259	0.0045	3.183E-08	++++
19	44952066	rs926054	T	G	0.91425	0.0334	0.0057	2.407E-08	++++
19	45017064	rs17800819	C	T	0.876	0.033	0.0053	1.172E-09	----
19	45140165	rs10460181	A	G	0.8127	0.0349	0.0045	7.26E-14	++++
19	45164732	rs2272021	T	G	0.93799	0.0634	0.0116	2.506E-08	++++
19	45165912	rs714948	A	C	0.1266	0.0364	0.006	2.498E-10	----
19	45237812	rs2965101	T	C	0.653	0.0499	0.0038	7.462E-38	++++
19	45247627	rs4803750	A	G	0.94459	0.1485	0.0075	7.897E-84	++++
19	45254168	rs8103315	A	C	0.1359	0.0422	0.0055	5.942E-15	++--
19	45313715	rs2927477	T	C	0.8826	0.0729	0.0134	8.167E-10	++++
19	45328476	rs11668536	C	T	0.7731	0.0388	0.0044	4.656E-17	++++
19	45329214	rs10402271	G	T	0.3404	0.0702	0.0037	8.895E-74	++++
19	45333834	rs4803760	C	T	0.8047	0.0837	0.0048	1.992E-65	++++
19	45344458	rs2972564	G	A	0.1741	0.0474	0.0065	2.573E-13	++++
19	45372354	rs8104483	G	T	0.2942	0.041	0.004	4.104E-22	++++
19	45373565	rs395908	G	A	0.8602	0.1169	0.0073	7.473E-55	++++
19	45382034	rs6859	A	G	0.442	0.0636	0.0037	5.019E-57	++++
19	45395266	rs157580	A	G	0.6201	0.0969	0.0043	3.16E-104	++++
19	45413576	rs75627662	C	T	0.8166	0.0351	0.0061	1.875E-08	++++
19	45415640	rs445925	G	A	0.91293	0.2212	0.0077	2.21E-166	++++
19	45422160	rs12721051	C	G	0.8427	-0.1061	0.0037	1.12E-179	++++
19	45427353	rs4803770	G	C	0.3734	0.0431	0.0042	1.17E-22	++++
19	45432557	rs7259004	G	C	0.90106	0.1247	0.0088	3.197E-44	++++
19	45477381	rs16979595	A	G	0.1873	0.0296	0.005	5.418E-09	++++
19	45650386	rs1048699	T	C	0.1029	0.0315	0.0056	3.742E-08	++++

19	45653227	rs8108762	G	A	0.6847	0.0262	0.004	1.291E-10	++++
19	46202172	rs2287019	C	T	0.81	0.0292	0.0046	4.018E-10	++++
19	46406463	rs17651629	C	T	0.91293	0.0324	0.0059	3.854E-08	++++
19	49213504	rs2452170	G	A	0.497	-0.042	NA	2E-19	++++
19	54797848	rs103294	T	C	0.186	0.0314	0.0045	2.27E-11	++++
20	17844684	rs2618566	G	T	0.35	0.031	NA	2.3E-10	++++
20	31392777	rs6058893	T	C	0.4719	0.0118	0.0022	4.83E-08	++++
20	34131396	rs12481365	T	C	0.1592	-0.032	0.0036	2.174E-19	++++
20	34285442	rs6060565	C	T	0.8074	0.0302	0.0046	1.936E-10	++++
20	39091487	rs2902940	A	G	0.7586	0.0241	0.0039	8.836E-10	++++
20	39180436	rs6016381	T	C	0.6398	0.0328	0.0036	5.062E-18	++++
20	39275603	rs6129653	T	C	0.3351	0.0283	0.004	5.749E-12	----
20	39293397	rs742748	T	C	0.5963	0.022	0.0037	4.826E-09	++++
20	39830122	rs2235367	G	A	0.4565	0.0357	0.0035	7.219E-25	++++
20	39870578	rs6129778	A	C	0.1781	0.0344	0.0043	5.145E-16	----
20	40078085	rs4142393	T	C	0.543	0.0172	0.003	8.981E-09	++++
21	40574305	rs2183573	A	G	0.4103	-0.0182	0.002	5.13E-19	++++
22	21916272	rs5754102	A	C	0.1892	-0.027	0.0038	1.239E-12	++++
22	35711098	rs138777	A	G	0.3483	0.0214	0.0037	4.74E-08	++++
22	44324727	rs738409	C	G	0.7355	0.0341	0.0062	3.602E-08	++++
22	46627603	rs4253772	T	C	0.1187	0.0322	0.0058	9.852E-09	++++
23	109716407	rs5942937	T	G	0.597	0.043	NA	1.4E-26	----

\* Indicates whether the SNP was present in each genetic study included in this analysis. (+) and (-) indicate the SNP is present or absent, respectively. The order of the studies is UK Biobank, GOCHA, ISGC ICH and GERFHS.

**Supplementary Table 2: SNPs used in the polygenic risk score of LDL cholesterol.**

Chr	Pos	rsid	EA	NEA	EAF	Beta	se	P	SNP Present in Study*
1	16509671	rs7538216	T	C	0.0718	-0.0132	0.0024	4.82E-08	++++
1	25768937	rs10903129	G	A	0.5369	0.0328	0.0037	3.03E-17	++++
1	27138393	rs12748152	T	C	0.07124	0.0499	0.0066	3.21E-12	+++
1	27397604	rs12410656	T	C	0.07388	0.0516	0.0083	3.57E-08	+++
1	55486064	rs2479394	G	A	0.285	0.0386	0.0041	1.58E-19	++++
1	55496039	rs11206510	T	C	0.8456	0.0831	0.005	2.38E-53	++++
1	55496556	rs2495495	T	C	0.1346	0.0342	0.0059	3.52E-08	++++
1	55504650	rs2479409	G	A	0.3325	0.0642	0.0041	2.52E-50	++++
1	55509872	rs4927193	T	C	0.8694	0.0352	0.0056	4.27E-11	++++
1	55516004	rs11206514	A	C	0.6108	0.0507	0.0041	9.95E-33	++++
1	55517344	rs572512	T	C	0.3456	0.0478	0.0047	5.31E-26	++++
1	55518166	rs625619	A	G	0.5435	0.0425	0.0053	7.25E-14	++++
1	55518752	rs7552841	T	C	0.3654	0.0368	0.0044	5.4E-15	++++
1	55524116	rs585131	T	C	0.8153	0.0637	0.005	2.7E-35	++++
1	55608005	rs1165226	T	C	0.591	0.0418	0.0054	3.61E-15	++++
1	55713628	rs4927207	G	A	0.8285	0.0692	0.0049	2.36E-39	++++
1	55724704	rs2647281	G	A	0.05541	0.0589	0.0095	2.27E-09	++++
1	55730327	rs6662286	C	T	0.90633	0.0989	0.0073	6.3E-36	++++
1	55743519	rs1874776	C	T	0.7823	0.044	0.0044	2.76E-21	++++
1	55808143	rs207145	T	C	0.8905	0.0495	0.0057	6.19E-18	++++
1	56240278	rs12066643	C	T	0.8813	0.0389	0.0064	1.06E-08	++++
1	62995263	rs12039115	C	T	0.8905	0.0345	0.0057	1.26E-09	++++
1	63094207	rs11485618	A	G	0.6913	0.05	0.0039	3.73E-33	++++
1	63211706	rs12129277	T	C	0.92348	0.0562	0.0094	4.83E-08	+++
1	63358816	rs7512480	T	C	0.4802	0.0221	0.0037	2.62E-08	++++
1	92993547	rs4970712	C	A	0.8061	0.0339	0.0044	2.46E-13	++++
1	107617707	rs1730859	A	G	0.0668	-0.0187	0.0025	4.12E-14	++++
1	109705022	rs676385	G	A	0.719	0.0354	0.0043	1.17E-15	++++
1	109715950	rs4970824	G	A	0.92876	0.0807	0.0097	4.59E-15	+++
1	109727284	rs648673	G	C	0.8852	0.0503	0.0057	1.16E-18	++++
1	109781909	rs603643	G	A	0.7375	0.0246	0.004	3.79E-09	++++
1	109782190	rs611060	C	T	0.5923	0.0534	0.0037	4.27E-42	++++
1	109783261	rs11102964	T	C	0.8325	0.0572	0.0049	7.96E-30	++++
1	109810981	rs17035630	A	G	0.128	0.0505	0.0061	1.44E-16	++++
1	109813719	rs17035665	C	T	0.8153	0.0772	0.0059	1.02E-38	++++
1	109815252	rs611917	A	G	0.6818	0.1122	0.0028	1E-300	++++
1	109822404	rs10410	A	G	0.1108	0.041	0.0061	6.2E-11	++++
1	109826136	rs657420	T	C	0.5185	0.0634	0.0039	6.96E-60	++++
1	109827253	rs672569	G	A	0.843	0.1431	0.0082	2.08E-64	++++
1	109838264	rs12127701	A	G	0.93404	0.1049	0.0082	4.54E-36	++++
1	109839896	rs7515901	C	T	0.8179	0.0489	0.0052	4.28E-18	++++
1	109845100	rs1278286	T	G	0.1438	0.0441	0.0061	8.82E-14	+++
1	110030945	rs1144593	A	G	0.6689	0.0325	0.0041	7.23E-14	++++
1	110061625	rs534135	T	C	0.5343	0.0214	0.0036	3.43E-08	++++
1	110109039	rs518076	A	G	0.93008	0.0467	0.0063	5.6E-14	++++
1	110169190	rs865774	C	T	0.8391	0.0354	0.0055	2.76E-10	++++
1	110198727	rs1010167	G	C	0.4156	0.025	0.0039	6.22E-11	++++
1	150958836	rs267733	A	G	0.8628	0.0331	0.0053	5.29E-09	++++
1	220970028	rs2642438	A	G	0.293	-0.047	NA	1.4E-19	++++
1	220975337	rs1874124	C	T	0.852	0.041	NA	2.6E-09	++++
1	220998913	rs7544735	A	G	0.3034	0.0265	0.0041	3.36E-11	++++
1	221055463	rs2247213	G	A	0.6609	0.0219	0.0038	1.41E-08	++++
1	234848763	rs10910490	A	G	0.1609	0.0382	0.0051	3.37E-13	++++



1	234857676	rs484084	T	C	0.4183	-0.033	0.0028	1.94E-31	++++
2	20985414	rs11679386	C	T	0.128	0.0452	0.0061	4.75E-14	+++
2	21092106	rs10178381	A	T	0.8879	0.0521	0.0066	4.11E-15	++++
2	21099871	rs6729410	A	G	0.6451	0.0389	0.004	8.8E-22	++++
2	21112689	rs12710745	A	G	0.6042	0.0429	0.0038	2E-28	++++
2	21119850	rs3903032	T	A	0.1055	0.0607	0.0061	1.98E-20	+++
2	21133883	rs10198175	A	G	0.08443	0.0768	0.0063	1.45E-32	++++
2	21188488	rs4665788	T	C	0.2256	0.0667	0.0042	1.12E-52	++++
2	21190209	rs6547409	C	T	0.94063	0.1226	0.0087	8.19E-45	+++
2	21196346	rs10207315	T	G	0.223	0.0492	0.0043	2.65E-28	++++
2	21206183	rs6754295	T	G	0.7414	0.0628	0.0042	1.64E-47	++++
2	21217490	rs13392272	T	C	0.4129	0.0875	0.0037	1.46E-118	++++
2	21219001	rs6725189	G	T	0.7652	0.0604	0.0045	5.63E-40	++++
2	21228827	rs1801701	T	C	0.07916	0.0638	0.0064	2.3E-21	++++
2	21245367	rs3791981	A	G	0.8799	0.0939	0.0067	2.03E-41	++++
2	21249716	rs12691202	C	T	0.94855	0.0966	0.0114	8.22E-19	+++
2	21263900	rs1367117	A	G	0.2876	0.1186	0.004	9.48E-183	++++
2	21270751	rs17398765	G	A	0.0686	0.0916	0.0076	3.54E-32	+++
2	21299867	rs577584	A	T	0.6896	0.1008	0.0031	1.15E-229	++++
2	21389659	rs4635554	G	T	0.3061	0.0783	0.0041	1.24E-75	++++
2	21453211	rs10198972	G	A	0.93404	0.1004	0.0095	5.33E-25	++++
2	21474487	rs312046	T	C	0.2968	0.0444	0.0039	2.78E-26	++++
2	21476634	rs7571647	G	A	0.8681	0.1009	0.0073	7.96E-38	++++
2	21502727	rs13396400	G	A	0.4446	0.0342	0.0037	1.01E-18	++++
2	21527036	rs6739502	A	G	0.4947	0.037	0.0036	5.27E-25	++++
2	21769639	rs2194562	A	G	0.09367	0.0457	0.0061	2.44E-11	+++
2	27741237	rs780094	T	C	0.3711	0.0261	0.0028	2.54E-21	++++
2	44022970	rs1025447	C	T	0.1583	0.0418	0.0048	3.78E-16	++++
2	44037488	rs3792008	A	G	0.814	0.0309	0.0047	1.78E-10	++++
2	44043135	rs10208987	T	G	0.91029	0.0486	0.0068	2.36E-12	++++
2	44057102	rs4148177	G	A	0.5673	0.0365	0.0051	1.15E-11	++++
2	44074000	rs4953023	G	A	0.91557	0.1313	0.0074	1.73E-66	++++
2	44074431	rs4245791	T	C	0.7072	-0.0604	0.0029	5.94E-94	++++
2	44075217	rs17424122	A	T	0.06596	0.0645	0.0091	5.4E-12	+++
2	44099582	rs4148218	G	A	0.8087	0.0441	0.0047	6.76E-21	++++
2	46166321	rs12712955	A	G	0.0577	0.014	0.0025	1.69E-08	++++
2	62871225	rs11125936	T	C	0.8984	0.0366	0.006	4.07E-08	++++
2	62955387	rs360801	A	G	0.6635	0.0186	0.003	7.02E-10	++++
2	70524142	rs14234	A	G	0.1492	-0.0112	0.002	2.07E-08	++++
2	109232388	rs826682	A	C	0.0647	-0.0175	0.0029	1.26E-09	++++
2	118849850	rs12464355	A	G	0.9087	0.0384	0.005	1.84E-14	+++
2	121306440	rs17050272	A	G	0.3889	-0.0216	0.0028	1.98E-14	++++
2	135762344	rs16831243	T	C	0.1807	0.0378	0.0055	9.06E-12	++++
2	136608646	rs4988235	G	A	0.4763	0.0278	0.0042	3.22E-11	++++
2	165513091	rs10195252	T	C	0.5818	0.0238	0.0039	3.81E-08	++++
2	169829772	rs2389606	T	C	0.5793	-0.0149	0.0026	1.62E-08	++++
2	203489457	rs182472492	A	G	0.7247	0.0276	0.0031	5.71E-19	++++
2	216304384	rs1250229	C	T	0.7889	0.0243	0.0042	3.13E-08	++++
2	234612539	rs7567229	A	C	0.3668	-0.0189	0.0029	4.26E-11	++++
2	234679384	rs11563251	T	C	0.1253	0.0345	0.0062	0.000000045	++++
3	12296469	rs9875338	G	A	0.6121	0.027	0.0037	2.21E-11	++++
3	12470239	rs1797912	A	C	0.63	0.03	NA	1.2E-09	++++
3	12489342	rs17819328	G	T	0.4261	0.0236	0.0038	6.17E-09	++++
3	12674199	rs11709504	T	C	0.7982	0.0251	0.0047	0.000000046	++++
3	32541553	rs17029617	A	G	0.1606	-0.0331	0.0041	3.9E-16	++++
3	52029991	rs62259757	A	G	0.0681	0.0388	0.0066	3.81E-09	+++

3	58386274	rs4560319	T	C	0.0817	-0.0266	0.0048	3.74E-08	++++
3	122176238	chr3:122176238:D	TG	T	0.688	-0.03	NA	4.6E-09	----
3	132163200	rs17404153	G	T	0.8562	0.0336	0.0054	1.83E-09	+---+
4	3434885	rs6818397	T	G	0.4129	0.0224	0.004	1.68E-08	++++
4	69341487	rs976058	T	C	0.5856	0.022	0.0027	2.02E-16	++++
5	74274675	rs4382144	A	G	0.5871	0.0289	0.0037	3.25E-15	++++
5	74405097	rs4361493	G	A	0.4077	0.0469	0.0038	1.11E-33	++++
5	74413713	rs2035191	C	T	0.186	0.0611	0.0047	5.7E-35	++++
5	74620377	rs3857388	C	T	0.128	0.0421	0.0059	2.2E-11	++++
5	74641560	rs10515198	A	G	0.1029	0.0599	0.0061	5.99E-22	++++
5	74656539	rs12916	C	T	0.4314	0.0733	0.0038	7.79E-78	++++
5	74745228	rs10070207	T	G	0.2296	0.0493	0.0045	1.1E-24	++++
5	74928883	rs253392	G	T	0.2625	0.0456	0.0041	8.28E-26	++++
5	74929312	rs16872670	A	G	0.05673	0.0553	0.0084	1.8E-09	++++
5	74971374	rs10515214	G	A	0.1821	0.0416	0.005	3.62E-16	++++
5	75034387	rs7715806	T	C	0.3879	0.0359	0.0039	2.1E-19	++++
5	75132546	rs7727150	G	T	0.4789	0.024	0.0038	4.97E-09	++++
5	122855416	rs4530754	A	G	0.5818	0.0275	0.0036	3.58E-12	++++
5	131797547	rs6894249	A	G	0.5782	-0.0154	0.0027	6.3E-09	++++
5	131804045	rs2522061	G	T	0.792	0.037	NA	2.5E-10	++++
5	141913503	rs249756	A	G	0.2164	0.0158	0.0029	4.11E-08	++++
5	156273481	rs4704810	A	G	0.3826	0.0217	0.0038	8.28E-09	++++
5	156390297	rs6882076	C	T	0.6662	0.0456	0.0038	3.31E-31	++++
5	156430705	rs1546288	A	G	0.3879	0.0298	0.0037	1.04E-14	++++
5	156468654	rs7715467	G	C	0.8377	0.0355	0.005	2.39E-11	++++
5	156475398	rs7706174	T	G	0.8232	0.0316	0.0047	8.08E-11	++++
6	16124560	rs6459450	T	C	0.672	0.044	NA	4.1E-18	++++
6	16195308	rs2327951	T	C	0.7296	0.027	0.0041	3.48E-10	++++
6	26093141	rs1800562	G	A	0.939	0.099	NA	1.6E-23	++++
6	27122444	rs71559014	A	G	0.9285	0.0399	0.0056	1.25E-12	+---
6	34592090	rs6907508	A	G	0.888	0.0244	0.0044	3.49E-08	++++
6	116352750	rs6909746	C	T	0.6082	0.0263	0.0037	7.86E-11	++++
6	135419042	rs35786788	G	A	0.742	0.041	NA	1.6E-14	++++
6	160402705	rs6917747	A	G	0.1398	0.0362	0.0054	8.07E-10	++++
6	160491741	rs3798180	A	G	0.6227	0.0271	0.0038	2.77E-12	++++
6	160543148	rs12208357	C	T	0.925	-0.064	NA	7.6E-13	+---
6	160543562	rs461473	G	A	0.90765	0.0427	0.0064	4.96E-10	++++
6	160560933	rs9457843	C	T	0.8931	0.0328	0.0057	2.62E-08	++++
6	160575985	rs2297374	C	T	0.611	0.039	NA	4.8E-16	++++
6	160578860	rs1564348	C	T	0.1451	0.0481	0.005	2.76E-21	++++
6	160735281	rs3125056	C	T	0.124	0.0346	0.0055	2.57E-09	++--
6	160737140	rs378479	G	C	0.4789	0.0221	0.0036	1.68E-08	++++
6	160953035	rs3127596	G	A	0.3087	0.0221	0.004	0.000000022	++++
6	160998148	rs3798221	G	T	0.777	0.0368	0.0045	1.06E-15	++++
6	161005389	rs191555775	A	T	0.901	0.049	NA	1.1E-09	+---
6	161010118	rs10455872	A	G	0.9351	-0.0881	0.0057	2.81E-54	+---
6	161018174	rs7770628	C	T	0.4485	0.0258	0.0037	3.17E-11	++++
6	161108536	rs6935921	T	C	0.7361	0.0298	0.0042	3.42E-11	++++
7	1082918	rs10275712	A	G	0.198	-0.0275	0.0033	1.91E-16	++++
7	21496496	rs6461566	C	T	0.3799	0.0231	0.0038	1.06E-08	++++
7	21611970	rs73066485	T	G	0.8132	-0.0295	0.0036	1.57E-16	++++
7	25991826	rs4722551	T	C	0.8459	-0.0324	0.0038	8.65E-18	++++
7	25997536	rs4719841	A	G	0.6174	0.0243	0.0038	5.78E-10	++++
7	44581986	rs17725246	T	C	0.7926	-0.0326	0.0033	1.88E-22	++++
7	44600695	rs217386	G	A	0.5923	0.0363	0.0038	1.2E-19	++++
7	44602589	rs7791240	C	T	0.09103	0.0425	0.0065	1.84E-10	+---

7	87076587	rs1014283	A	C	0.1422	-0.0164	0.0027	7.43E-10	++++
8	9171735	rs713286	T	C	0.92216	0.0473	0.0072	4.5E-10	++++
8	9175958	rs330093	C	G	0.7784	0.0321	0.0045	4.64E-12	++++
8	9181395	rs2169387	A	G	0.1311	-0.0422	0.0041	2.79E-25	++++
8	9206069	rs10102352	G	A	0.6161	0.0321	0.0053	1.06E-08	++++
8	10508801	rs7821092	C	G	0.5705	-0.0208	0.0031	2.15E-11	++++
8	21937667	rs6557781	T	C	0.0573	-0.0186	0.0029	1.58E-10	++++
8	55421614	rs10102164	A	G	0.1741	0.0316	0.0045	3.74E-11	++++
8	59392324	rs9297994	A	G	0.6903	-0.0282	0.003	7.7E-21	++++
8	116663898	rs2737252	G	A	0.7441	0.0314	0.0041	7.04E-14	++++
8	126449406	rs17405319	T	C	0.1636	0.0403	0.0052	2.92E-14	++++
8	126470817	rs4518686	G	A	0.4024	0.0407	0.0039	1.39E-23	++++
8	126474356	rs2980884	G	A	0.3681	0.0299	0.004	5.69E-13	++++
8	126478450	rs2001846	T	C	0.4479	0.0539	0.0028	2.73E-82	++++
8	126500350	rs8180991	G	C	0.2309	0.045	0.0044	1.8E-22	++++
8	145022657	rs7832643	T	G	0.405	0.0339	0.0038	2.67E-17	++++
9	2640759	rs3780181	A	G	0.8776	0.0315	0.0046	1.23E-11	++++
9	19217421	rs13288021	T	C	0.0819	0.0408	0.0064	2.43E-10	++++
9	107595602	rs7873387	A	C	0.8136	-0.0211	0.0038	3.79E-08	++++
9	107664301	rs1883025	C	T	0.7573	0.0296	0.0044	6.14E-11	++++
9	136064766	rs11795315	A	G	0.3232	0.0286	0.004	1.44E-11	++++
9	136084941	rs4489379	T	C	0.5726	0.0312	0.0039	4.32E-15	++++
9	136094150	rs4246169	A	C	0.8377	0.0319	0.0051	2.94E-09	++++
9	136132754	rs8176722	C	A	0.8892	0.0473	0.006	1.85E-14	++++
9	136132873	rs8176720	T	C	0.6636	0.0332	0.0038	1.59E-17	++++
9	136141870	rs2519093	T	C	0.1808	0.0737	0.0034	8.27E-102	+---
9	136149722	rs630014	G	A	0.5343	0.0311	0.0037	2.1E-16	++++
9	136155359	rs7030248	G	A	0.6135	0.0298	0.0039	5.95E-12	++++
9	136191010	rs11244084	T	C	0.08047	0.0696	0.0104	7.86E-11	+---
9	136194595	rs17150482	T	C	0.7282	0.0276	0.0041	6.03E-10	++++
9	136323754	rs4962153	A	G	0.153	0.0469	0.0062	2.32E-13	++++
10	17268839	rs3758413	T	C	0.6103	-0.0176	0.0027	7.94E-11	++++
10	94839724	rs4418728	T	G	0.4271	-0.016	0.0027	1.81E-09	++++
10	113933886	rs2255141	A	G	0.298	0.047	NA	8.1E-20	++++
10	124693587	rs7904973	T	G	0.5573	0.0203	0.0026	1.08E-14	++++
11	18656271	rs10832962	T	C	0.719	0.032	0.004	6.62E-14	++++
11	46301255	rs73461870	A	G	0.8911	-0.0249	0.0045	3.46E-08	++++
11	61548874	rs174532	A	G	0.2929	0.0353	0.0042	3.13E-16	++++
11	61594920	chr11:61594920:D	CT	C	0.662	0.074	NA	8.6E-50	----
11	61601908	rs2845573	A	G	0.8971	0.0536	0.0061	1.24E-17	++++
11	61636126	rs11230815	C	G	0.8694	0.0407	0.0064	4.24E-09	++++
11	61641542	rs174450	T	G	0.529	0.0312	0.0037	4.06E-16	++++
11	116525867	rs481843	T	C	0.1042	0.0445	0.0065	1E-10	++++
11	116590787	rs6589563	A	G	0.08179	0.0562	0.0067	5.34E-17	++++
11	116670182	rs11600380	T	C	0.92348	0.0558	0.0081	1.25E-11	++++
11	116670676	rs6589567	A	C	0.1372	0.0493	0.0064	3.12E-14	++++
11	117075566	rs508487	T	C	0.08179	0.0561	0.0085	1.77E-10	+---
11	118540104	rs506234	C	G	0.5641	-0.0173	0.0027	8.28E-11	++++
11	122504717	rs11218721	A	C	0.3808	0.0175	0.0028	5.76E-10	++++
11	126152647	rs10893493	G	A	0.1187	0.0345	0.0057	3.17E-09	++++
11	126217870	rs582037	T	C	0.3377	0.025	0.0042	1.5E-09	++++
11	126228659	rs4937122	G	T	0.08839	0.0688	0.0074	1.81E-20	++++
11	126241979	rs10893499	A	G	0.1438	0.0521	0.0053	3.86E-21	++++
12	51055708	rs1521516	T	C	0.0584	-0.0164	0.0024	3.22E-12	++++
12	112007756	rs653178	T	C	0.5505	0.0258	0.0028	3.71E-20	++++
12	112718510	rs10850024	A	C	0.2599	0.025	0.0041	3.2E-10	++++

12	121416650	rs1169288	A	C	0.6937	-0.0327	0.003	1.08E-27	++++
12	121436376	rs1169303	C	A	0.5013	0.0202	0.0036	2.47E-08	++++
12	121487632	rs2708101	T	C	0.5092	0.0205	0.0037	4.45E-09	++++
13	32896846	rs206070	A	G	0.1781	0.0263	0.0048	4.63E-08	+---
13	32953388	rs4942486	T	C	0.4617	0.0243	0.0037	2.26E-11	++++
13	33040430	rs703212	A	G	0.1797	-0.0282	0.0037	2.43E-14	++++
13	114547372	rs6602911	T	C	0.4294	0.0154	0.0028	2.65E-08	++++
14	24883887	rs8017377	A	G	0.4591	0.0303	0.0038	2.52E-15	++++
14	70847124	rs8022288	T	C	0.8636	0.0259	0.0039	2.97E-11	++++
15	58214210	rs2218260	T	C	0.5904	-0.0187	0.0032	3.66E-09	++++
15	75289722	rs3812945	T	C	0.0965	-0.0138	0.0023	8.08E-10	++++
16	11631568	rs34318965	T	C	0.7126	0.0169	0.0029	8.13E-09	++++
16	56985555	rs12448528	A	G	0.2269	0.037	0.0052	1.06E-12	++++
16	56989590	rs247616	C	T	0.7071	0.0547	0.0041	2.57E-37	++++
16	56993025	rs12920974	T	G	0.3153	0.0324	0.0056	2.96E-08	++++
16	56997233	rs1864163	A	G	0.2678	0.0437	0.0045	7.97E-21	++++
16	68054788	rs112595563	A	G	0.7352	0.0197	0.0033	3.63E-09	++++
16	71583859	rs2434885	C	T	0.801	0.044	NA	1.8E-13	++++
16	71869520	rs8044335	C	A	0.4446	0.0306	0.0037	5.59E-15	++++
16	71983664	rs1549292	G	T	0.1425	0.0385	0.0054	6.42E-11	++++
16	72007232	rs7197967	G	A	0.8628	0.0366	0.0055	4.58E-10	++++
16	72009676	rs12931964	G	T	0.1649	0.0331	0.0051	1.18E-09	+---
16	72042682	rs3213422	A	C	0.5026	0.0268	0.0038	4.46E-11	++++
16	72108093	rs2000999	A	G	0.1847	0.065	0.0046	4.22E-41	++++
16	72114002	rs217181	C	T	0.7876	0.0546	0.0049	1.13E-25	++++
16	72144174	rs9302635	T	C	0.8232	0.0398	0.0049	2.03E-15	++++
16	72225187	rs16970670	T	A	0.05409	0.0586	0.0095	1.73E-08	+---
16	72243624	rs8060878	G	A	0.4367	0.0276	0.0037	8.6E-12	++++
16	72312727	rs12921986	G	A	0.06332	0.0461	0.0072	1.62E-09	++++
16	72800567	rs8044476	G	A	0.1293	0.0309	0.0053	3.53E-08	++++
16	83979317	rs67890964	T	C	0.635	0.028	NA	0.000000015	++++
16	88551153	rs12597024	T	C	0.638	0.0156	0.0028	2.42E-08	++++
17	7080069	rs12945299	A	G	0.817	0.04	NA	1E-10	++++
17	7088923	rs11650232	G	A	0.4604	0.0221	0.0039	3.19E-08	++++
17	8216468	rs871841	T	C	0.4615	-0.0148	0.0026	2.23E-08	++++
17	18125877	rs62072497	A	G	0.1881	0.0202	0.0034	3.27E-09	++++
17	26694861	rs704	A	G	0.5011	0.0192	0.0026	1.48E-13	++++
17	45391804	rs7225700	C	T	0.6728	0.0297	0.0038	3.56E-13	++++
17	45425115	rs7206971	G	A	0.515	-0.047	NA	4.4E-23	++++
17	67150176	rs2886232	T	C	0.1201	0.0451	0.0064	3.88E-11	++++
17	73790093	rs1047743	C	G	0.6027	0.0162	0.0029	1.72E-08	++++
17	76392144	rs17561950	A	G	0.4592	0.0181	0.0027	2.04E-11	++++
19	10680241	rs17677316	A	G	0.2507	0.0246	0.0042	2.08E-09	++++
19	10686123	rs10403668	G	A	0.8377	0.0439	0.0052	3.1E-15	++++
19	10728030	rs8106664	T	G	0.7704	0.053	0.0046	1.5E-27	++++
19	10802792	rs13465	G	A	0.9314	0.103	0.0085	3.97E-30	++++
19	10830281	rs12974306	T	G	0.4235	0.0221	0.0037	3.38E-08	++++
19	10904689	rs1610095	G	C	0.558	0.056	NA	1.8E-25	++++
19	10950125	rs11881156	C	T	0.8377	0.0811	0.0049	1.7E-55	++++
19	11023434	rs1529711	T	C	0.1609	0.0323	0.0051	2.52E-10	++++
19	11114352	rs12983316	G	A	0.1689	0.0514	0.0052	7.44E-22	+---
19	11146499	rs3786721	T	C	0.4617	0.0468	0.0038	2.89E-31	++++
19	11161537	rs3786722	C	A	0.7573	0.0754	0.0043	5.52E-63	++++
19	11187324	rs143020224	C	G	0.8693	0.1619	0.0039	1E-300	++++
19	11190764	rs36005514	A	G	0.0752	0.0626	0.0096	7.06E-10	+---
19	11206530	rs8110695	T	A	0.8206	0.1084	0.005	6.49E-99	-+++

19	11227602	rs688	T	C	0.4472	0.054	0.0037	1.01E-43	++++
19	11233941	rs5927	G	A	0.7296	0.0345	0.0045	2.77E-13	++++
19	11242307	rs2738464	C	G	0.8747	0.0422	0.0061	2.73E-10	++++
19	11243445	rs5742911	A	G	0.7322	0.0606	0.0057	4.83E-24	++++
19	11266584	rs892114	A	G	0.2269	0.0353	0.0047	7.63E-13	++++
19	11275139	rs7188	C	A	0.3259	0.0521	0.0043	9.39E-31	++++
19	11284302	rs379309	C	T	0.5026	0.0313	0.0039	1.39E-13	++++
19	11392431	rs376642	C	T	0.715	0.0233	0.004	4.67E-10	++++
19	19103986	rs3810444	T	A	0.94459	0.0624	0.0084	2.6E-12	+---
19	19407718	rs10401969	T	C	0.92876	0.1184	0.0072	2.65E-54	++++
19	19525792	rs2965185	T	C	0.7256	0.0372	0.004	5.8E-18	++++
19	19841752	rs12608822	C	T	0.94855	0.0747	0.0094	1.3E-14	+---
19	44675801	rs17657025	T	C	0.93404	0.035	0.0066	0.000000044	+---
19	44880360	rs1594895	T	C	0.8179	0.0333	0.0046	4.42E-12	++++
19	44952066	rs926054	T	G	0.91425	0.0485	0.0059	3.36E-15	++++
19	44955113	rs204541	C	A	0.7084	0.0259	0.004	1.59E-10	-+++
19	45013959	rs17800760	G	A	0.8681	0.0513	0.0053	8.87E-22	++++
19	45140165	rs10460181	A	G	0.8127	0.0536	0.0046	2.25E-28	++++
19	45164732	rs2272021	T	G	0.93799	0.0937	0.0118	1.47E-16	++++
19	45165912	rs714948	A	C	0.1266	0.0479	0.0063	2.54E-14	+---
19	45202027	rs12150984	A	G	0.2718	0.0308	0.0047	1.28E-12	++++
19	45237812	rs2965101	T	C	0.653	0.0668	0.004	1.07E-60	++++
19	45245015	rs2965174	G	A	0.5686	0.0253	0.004	5.21E-11	++++
19	45254168	rs8103315	A	C	0.1359	0.0558	0.0057	1.62E-22	+++-
19	45298069	rs10419669	A	G	0.06596	0.0471	0.0078	2.36E-09	++++
19	45313715	rs2927477	T	C	0.8826	0.1285	0.0139	2.58E-23	++++
19	45328476	rs11668536	C	T	0.7731	0.0513	0.0045	4.3E-26	++++
19	45329214	rs10402271	G	T	0.3404	0.0927	0.0038	2.6E-118	++++
19	45333834	rs4803760	C	T	0.8047	0.1189	0.0049	2.47E-123	++++
19	45344458	rs2972564	G	A	0.1741	0.066	0.0068	2.77E-22	++++
19	45372354	rs8104483	G	T	0.2942	0.0517	0.0042	7.75E-33	++++
19	45373565	rs395908	G	A	0.846	0.136	NA	2.7E-97	++++
19	45382034	rs6859	A	G	0.442	0.0835	0.0039	4.65E-88	++++
19	45395266	rs157580	A	G	0.6201	0.1078	0.0045	9.24E-119	++++
19	45395619	rs2075650	G	A	0.1266	0.1767	0.0055	1.72E-214	++++
19	45416741	rs438811	C	T	0.762	0.082	NA	5.9E-45	++++
19	45427353	rs4803770	G	C	0.3734	0.0545	0.0044	3.9E-34	++++
19	45432557	rs7259004	G	C	0.90106	0.2094	0.0092	1.37E-110	++++
19	45439163	rs35136575	C	G	0.7718	0.0409	0.0058	2.56E-11	++++
19	45447178	rs5158	C	T	0.8694	0.0658	0.01	2.74E-10	++++
19	45650386	rs1048699	T	C	0.1029	0.0324	0.0058	1.81E-08	++++
19	45653227	rs8108762	G	A	0.6847	0.0394	0.0041	1.45E-20	++++
19	46202172	rs2287019	C	T	0.81	0.0283	0.0048	8.36E-09	++++
19	46207810	rs732841	A	C	0.94987	0.0573	0.0089	1.96E-10	++++
19	49206108	rs679574	C	G	0.5201	-0.0247	0.0026	2.47E-21	++++
19	58651296	rs34503352	G	A	0.836	0.039	NA	7.4E-10	++++
20	12962718	rs364585	G	A	0.6332	0.0249	0.0038	4.28E-10	++++
20	17844684	rs2618566	T	G	0.6491	-0.03	0.0031	9.37E-22	++++
20	17847735	rs2745865	T	C	0.1504	0.0399	0.0069	3.19E-08	++++
20	34166100	rs6088882	C	G	0.2007	-0.025	0.0033	8.4E-14	++++
20	39091487	rs2902940	A	G	0.7586	0.0274	0.0041	1.74E-11	++++
20	39180436	rs6016381	T	C	0.6398	0.0363	0.0038	6.85E-20	++++
20	39237558	rs2865507	A	G	0.4248	0.0211	0.004	0.000000032	++++
20	39275603	rs6129653	T	C	0.3351	0.0296	0.0042	2.55E-11	-+++
20	39291784	rs16989232	G	A	0.6438	0.0247	0.0039	1.35E-09	++++
20	39724338	rs6065311	C	T	0.4604	0.0417	0.0036	1.66E-30	++++

20	39870578	rs6129778	A	C	0.1781	0.0375	0.0045	3.15E-17	----
20	39996771	rs6124342	A	T	0.09499	0.0318	0.0054	6.23E-09	++++
20	40078085	rs4142393	T	C	0.4512	0.0214	0.0036	1.35E-09	++++
22	37462936	rs855791	A	G	0.0902	0.0123	0.0019	1.19E-10	++++
22	46629479	rs4253776	G	A	0.124	0.0311	0.0059	3.35E-08	++++
23	109716407	rs5942937	T	G	0.597	0.039	NA	7.6E-21	----

\* Indicates whether the SNP was present in each genetic study included in this analysis. (+) and (-) indicate the SNP is present or absent, respectively. The order of the studies is UK Biobank, GOCHA, ISGC ICH and GERFHS.

Supplementary Table 3: SNPs used in the polygenic risk score of HDL cholesterol.

Chr	Pos	rsid	EA	NEA	EAF	Beta	se	P	SNP Present in Study*
1	26900708	rs2229714	G	A	0.8641	0.0294	0.0048	6.09E-09	++++
1	27236212	rs17162330	T	C	0.8668	0.038	0.0049	1.44E-13	++++
1	40035928	rs3768321	T	G	0.1737	-0.0505	0.004	1.42E-36	----
1	93862020	rs10874777	T	C	0.4369	0.0244	0.0028	7.03E-18	++++
1	107549245	rs2878349	A	G	0.3106	-0.0135	0.0024	1.36E-08	++++
1	109822166	rs599839	G	A	0.228	0.036	NA	1.2E-15	++++
1	110470764	rs333947	G	A	0.8536	0.0296	0.0047	3.17E-09	++++
1	110499669	rs390923	A	G	0.5831	0.0203	0.0035	1.05E-08	++++
1	149909495	rs10494363	A	G	0.0686	0.0297	0.0048	4.4E-10	+++-
1	150940625	rs267738	T	G	0.8083	-0.0248	0.0036	6.22E-12	+++-
1	156700651	rs12145743	G	T	0.3311	0.0203	0.0036	0.000000018	++++
1	178533832	rs4077194	T	G	0.4801	-0.0186	0.0027	8.85E-12	++++
1	182150978	rs1689797	C	A	0.6979	0.0358	0.0036	2.85E-21	++++
1	184049978	rs10911505	T	C	0.673	0.0134	0.0023	1.12E-08	++++
1	205719532	rs823114	A	G	0.4983	0.0151	0.0022	5.06E-12	++++
1	214992980	rs4655268	C	G	0.4562	0.0166	0.0028	1.95E-09	++++
1	219664030	rs2066152	A	G	0.4025	0.0205	0.0028	9.04E-14	++++
1	220970028	rs2642438	G	A	0.7454	0.0303	0.0039	7.78E-14	++++
1	230287128	rs1998064	G	T	0.2467	0.0322	0.0039	3.41E-13	++++
1	230295691	rs4846914	A	G	0.5456	0.0409	0.0028	4.2E-48	++++
1	230324119	rs627702	G	A	0.8245	0.0501	0.0047	5.05E-24	++++
1	230398102	rs632557	G	A	0.94459	0.0512	0.0083	1.78E-08	++++
2	239597	rs6710091	C	G	0.686	-0.0165	0.003	4.63E-08	++++
2	3634753	rs4850047	T	C	0.1359	0.0193	0.0031	5.11E-10	++++
2	21112689	rs12710745	A	G	0.6042	0.0217	0.0035	2.91E-08	++++
2	21125742	rs4468779	T	C	0.7427	0.0239	0.004	3.9E-09	++++
2	21141815	rs4533439	T	C	0.5765	0.0261	0.0034	2.6E-13	++++
2	21213062	rs6722374	G	T	0.5712	0.03	0.0034	1.29E-16	----
2	21221399	rs952275	T	G	0.5712	0.0321	0.0034	7.49E-21	++++
2	21231524	rs676210	A	G	0.2052	0.0546	0.0033	4.81E-63	++++
2	58950363	rs17615494	T	G	0.2881	-0.0167	0.0026	1.47E-10	++++
2	65282708	rs6728523	C	G	0.2803	0.0239	0.003	2.37E-15	++++
2	66665146	rs2280334	T	C	0.3791	-0.0115	0.0019	1.62E-09	++++
2	85560562	rs10198423	G	C	0.356	-0.024	NA	4.2E-09	----
2	111664756	rs6720034	A	G	0.6594	0.0146	0.0024	1.94E-09	++++
2	146371961	rs13396091	A	G	0.4308	-0.0129	0.0021	9.55E-10	++++
2	165508389	rs10184004	C	T	0.594	-0.03	NA	1.7E-15	++++
2	165540800	rs12328675	T	C	0.872	-0.046	NA	1.6E-16	++++
2	165644545	rs355909	C	T	0.4736	0.0198	0.0034	2.27E-08	++++
2	203477868	rs72926946	A	C	0.2784	-0.0228	0.003	6.1E-14	++++
2	211540507	rs1047891	C	A	0.6979	0.0269	0.0039	8.73E-10	++++
2	219699999	rs78058190	G	A	0.948	0.06	NA	1.9E-12	----
2	227094758	rs2203452	A	G	0.3482	0.0417	0.0028	8.82E-52	++++
2	227113202	rs2396303	C	T	0.777	0.0241	0.0043	4.33E-08	++++
3	11400249	rs2606736	C	T	0.3945	0.0246	0.0043	0.000000048	++++
3	12379351	rs35240997	A	G	0.7924	-0.0256	0.0035	1.25E-13	++++
3	24293001	rs2044753	T	C	0.8682	0.0208	0.0036	9.3E-09	++++
3	36979042	rs6777217	A	G	0.4746	-0.0129	0.0019	3.31E-12	++++
3	47097985	rs62246406	A	G	0.1629	-0.0237	0.0038	4.53E-10	++++
3	48767877	rs6808104	A	G	0.534	0.0158	0.0027	7.3E-09	----
3	50024038	rs111439884	A	C	0.5043	0.0221	0.0027	2.77E-16	++++
3	52372366	rs11706108	T	C	0.7059	-0.026	0.0034	2.11E-14	++++
3	52529899	rs9863753	A	T	0.06	0.064	NA	5.7E-14	++++

3	119560606	rs6805251	T	C	0.3813	0.02	0.0035	1.33E-08	++++
3	131751775	rs13076253	A	C	0.8522	0.0283	0.0048	4.96E-09	++++
3	135932359	rs687339	C	T	0.2335	0.0316	0.0042	7.11E-13	++++
3	152171870	rs3773910	C	G	0.7604	-0.0161	0.0025	1.2E-10	++++
3	156795414	rs9817452	T	G	0.3746	0.0283	0.0029	6.78E-22	++++
3	185803532	rs112545201	C	T	0.867	0.043	NA	9.6E-15	++++
3	185931174	rs2268840	T	C	0.7876	-0.0215	0.0034	1.66E-10	++++
4	858332	rs11248051	T	C	0.0929	-0.0183	0.0032	1.76E-08	++++
4	26062990	rs10019888	A	G	0.8364	0.027	0.0046	0.000000049	++++
4	69349018	rs1117816	A	C	0.78	-0.0212	0.0033	2.07E-10	++++
4	88018991	rs2035403	A	G	0.601	0.024	NA	2E-10	++++
4	89740128	rs13133548	A	G	0.4745	-0.0216	0.0026	1.6E-16	++++
4	100014805	rs2602836	A	G	0.4274	0.0192	0.0034	4.96E-08	++++
4	100517324	rs12509976	T	C	0.0995	0.0394	0.0055	8.49E-13	++++
4	103188709	rs13107325	T	C	0.0765	-0.0798	0.0053	1.54E-50	+++
4	154224048	rs17369400	A	G	0.9053	0.0208	0.0036	7.16E-09	+++
4	157720124	rs4691380	T	C	0.4071	0.0159	0.0028	1.15E-08	++++
5	53274467	rs28499105	A	G	0.708	-0.0171	0.0029	4.53E-09	++++
5	53298025	rs6450176	G	A	0.7216	0.0254	0.0039	6.88E-10	++++
5	55806751	rs459193	A	G	0.2967	0.029	0.0029	2.01E-23	++++
5	55861601	rs9687833	G	A	0.796	0.029	NA	4.3E-10	++++
5	72926514	rs6881956	A	G	0.2605	-0.0163	0.0028	3.23E-09	++++
5	75003678	rs2307111	T	C	0.5474	-0.023	0.0028	3E-16	++++
5	118729286	rs1045241	T	C	0.2937	0.0136	0.0024	9.47E-09	++++
5	158022041	rs2434612	A	G	0.7005	0.0216	0.0025	1.55E-18	++++
5	170459675	rs7730898	A	G	0.7431	-0.0184	0.0024	1.63E-14	++++
6	34546560	rs2814982	C	T	0.8931	0.0371	0.0055	1.22E-11	++++
6	34668635	rs9368830	T	C	0.574	0.0277	0.0029	4.07E-21	++++
6	35057331	rs3822921	G	A	0.8588	0.0309	0.0053	2.35E-09	+++
6	41934514	rs4130023	T	C	0.2084	-0.0149	0.0026	1.69E-08	++++
6	42928461	rs10948059	C	T	0.523	-0.023	NA	1.2E-09	++++
6	43757896	rs998584	A	C	0.4455	-0.0368	0.0028	5.16E-40	++++
6	52736056	rs12529923	C	T	0.611	0.021	NA	0.000000027	++++
6	127437100	rs9491694	T	A	0.7533	0.0212	0.0038	5.44E-10	++++
6	127476717	rs2489629	T	C	0.5744	-0.0175	0.0027	6.23E-11	++++
6	127524398	rs72961007	C	A	0.939	0.051	NA	6.9E-11	+++
6	137076010	rs6925103	T	C	0.5094	-0.0121	0.0019	4.34E-10	++++
6	139835418	rs199607859	T	G	0.548	0.0203	0.0027	7.04E-14	++++
6	160929904	rs9457931	A	G	0.9314	0.0552	0.0073	7.3E-13	+++
6	161092438	rs11751347	T	C	0.0857	-0.0636	0.0054	2.36E-32	+++
7	6461310	rs79949326	T	C	0.2327	0.024	0.0033	3.19E-13	++++
7	6474073	rs836534	T	C	0.438	0.0214	0.0034	8.25E-10	++++
7	12269417	rs3173615	C	G	0.5291	0.0117	0.0019	1.81E-09	++++
7	17911752	rs1917368	T	G	0.465	-0.028	0.0027	1.72E-24	++++
7	26370190	rs4722593	A	G	0.3238	0.0209	0.0032	3.88E-11	++++
7	50305863	rs4917014	G	T	0.3404	0.0222	0.0036	1.03E-08	++++
7	73037366	rs55747707	A	G	0.1796	0.0314	0.0035	5.85E-19	++++
7	130432481	rs6971365	T	C	0.7147	0.0262	0.003	2.29E-18	++++
7	150307167	rs13225097	A	G	0.7678	0.0227	0.0039	4.33E-08	++++
7	150529449	rs17173637	T	C	0.9156	0.0294	0.0048	8.65E-10	++++
8	6599005	rs2936512	T	C	0.3019	-0.0144	0.0023	9.05E-10	++++
8	9171735	rs713286	T	C	0.92216	0.0496	0.0066	8.01E-14	++++
8	9178921	rs12543276	A	G	0.7836	0.038	0.0042	6.56E-20	++++
8	9183596	rs4841132	A	G	0.1054	-0.0954	0.0044	1.2E-105	++++
8	9203101	rs930991	C	A	0.2612	0.0253	0.0039	3.75E-10	++++
8	9206069	rs10102352	G	A	0.6161	0.0411	0.0049	1.52E-14	++++



8	10641965	rs7014168	G	A	0.7586	0.0267	0.0041	9.2E-10	++++
8	19576448	rs10085966	T	C	0.4591	0.0232	0.0039	9.8E-09	++++
8	19650333	rs11204072	C	T	0.153	0.0341	0.0044	1.28E-13	++++
8	19709575	rs4599828	T	C	0.467	0.0232	0.0035	4.73E-11	++++
8	19715236	rs6586872	A	G	0.2559	0.0387	0.0039	4.76E-21	++++
8	19727047	rs1441778	C	T	0.1451	0.0497	0.008	1.31E-09	++++
8	19738260	rs6586876	A	G	0.6135	0.0245	0.0035	1E-12	++++
8	19748603	rs7844579	T	C	0.4736	0.022	0.0034	1.03E-08	++++
8	19749390	rs3898938	T	C	0.4393	0.0254	0.0034	7.81E-13	++++
8	19755977	rs12543154	T	G	0.1702	0.0677	0.0045	2.74E-47	++++
8	19799641	rs1534649	T	G	0.4485	0.0245	0.0035	2.11E-12	++++
8	19815098	rs283	C	T	0.7652	0.0351	0.0046	4.61E-14	++++
8	19817997	rs312	C	G	0.1201	0.0471	0.0052	8.32E-19	++++
8	19824492	rs13702	C	T	0.3127	0.1058	0.0038	1.28E-160	++++
8	19850099	rs79407615	T	G	0.9025	-0.1799	0.0049	3E-293	++++
8	19859120	rs4490856	C	T	0.5792	0.0604	0.0034	5.97E-64	++++
8	19870693	rs7005359	G	A	0.2058	0.0715	0.0052	1.22E-40	++++
8	19874153	rs4922119	T	C	0.4499	0.0703	0.0035	7.45E-84	++++
8	19878154	rs1534650	C	T	0.7243	0.0455	0.0038	8.13E-31	++++
8	19890654	rs4557718	T	C	0.8734	0.0522	0.0061	5.74E-18	----
8	19936687	rs28597716	G	A	0.2137	0.0688	0.006	4.5E-26	++++
8	19942181	rs13263508	T	G	0.5699	0.0519	0.0035	9.53E-46	++++
8	19949300	rs7003526	T	C	0.4156	0.0226	0.0037	6.66E-10	++++
8	19968929	rs16842	T	C	0.7467	0.03	0.0038	3.82E-14	++++
8	71260460	rs10504474	A	G	0.1043	-0.028	0.0037	2.14E-14	++++
8	116603103	rs2721954	T	C	0.609	0.0305	0.0029	1.43E-26	++++
8	121860589	rs13248499	G	A	0.338	0.024	NA	3.7E-09	++++
8	126506694	rs112875651	G	A	0.62	-0.036	NA	7.5E-19	++++
8	126507389	rs2954038	A	C	0.7182	0.041	0.003	1.14E-41	++++
8	126514676	rs7012891	T	C	0.7704	0.0232	0.004	2.13E-08	++++
8	144303418	rs10087900	G	A	0.5607	0.0231	0.0036	2.17E-09	++++
9	15288045	rs10810369	G	A	0.8061	0.0411	0.0046	6.05E-18	++++
9	15304782	rs686030	A	C	0.8696	0.0431	0.004	1.34E-27	++++
9	17295541	rs10963012	C	G	0.6314	-0.0362	0.0065	3.15E-08	++++
9	107562804	rs2230808	C	T	0.7889	0.0385	0.004	1.59E-20	++++
9	107589744	rs4149307	T	C	0.3233	0.0685	0.0033	2.95E-93	++++
9	107626389	rs4149281	T	C	0.1201	0.0369	0.0052	4.55E-12	++++
9	107629104	rs4743764	T	C	0.6082	0.0427	0.0057	1.6E-16	++++
9	107647019	rs11789603	C	T	0.893	-0.065	NA	7.3E-27	++++
9	107651212	rs2275544	T	C	0.8654	0.0825	0.0049	1.17E-58	++++
9	107664301	rs1883025	C	T	0.7573	0.0698	0.0041	1.5E-65	++++
9	107665751	rs2482424	T	C	0.1372	0.0311	0.0054	9.93E-09	+++-
9	107668064	rs3905001	C	G	0.2744	0.0336	0.0051	4.37E-12	++++
9	107668886	rs2777794	A	T	0.4578	0.0273	0.0037	6.45E-13	++++
9	107684230	rs2472509	G	T	0.3615	0.0227	0.0037	1.21E-09	++++
10	8576206	rs4749779	A	G	0.7382	-0.0158	0.0027	4.19E-09	++++
10	46013277	rs970548	C	A	0.277	0.0258	0.0039	1.71E-10	++++
10	65230164	rs10761771	C	T	0.467	0.0198	0.0034	4.12E-09	++++
10	94839642	rs2068888	G	A	0.536	-0.026	NA	4.6E-11	++++
10	101912194	rs1408579	T	C	0.4351	0.0185	0.0028	6.89E-11	++++
10	113921825	rs2792735	A	G	0.7206	-0.0306	0.0033	5.79E-21	++++
10	114048792	rs2148489	T	C	0.7757	0.0283	0.0041	1.41E-10	++++
10	115786233	rs72823013	A	G	0.1124	0.0266	0.0045	3.74E-09	----
10	122859177	rs7079858	G	T	0.911	0.037	NA	0.000000017	++++
11	2958538	rs7935422	T	C	0.599	0.022	NA	0.000000019	++++
11	13355770	rs6486121	T	C	0.6199	-0.015	0.0023	9.83E-11	++++

11	27675712	rs1519480	T	C	0.5935	0.014	0.0023	6.03E-10	++++
11	45740020	rs74458891	T	C	0.07256	0.0526	0.0085	6.49E-09	+---
11	46309968	rs6485672	G	A	0.5026	0.0246	0.0035	3.42E-10	++++
11	46744368	rs3136447	C	T	0.2269	0.0543	0.0068	5.08E-16	++++
11	47188592	rs3740690	T	C	0.5739	0.0243	0.0034	5.67E-12	++++
11	47266471	rs75393320	C	G	0.1212	0.0647	0.0046	7.92E-45	+---
11	47318157	rs749067	T	C	0.6082	0.0212	0.0035	7.39E-09	++++
11	47370607	rs2697920	T	C	0.3602	0.0387	0.0037	1E-22	++++
11	47396654	rs4752829	A	G	0.2929	0.0404	0.0038	6.76E-25	++++
11	47752775	rs17788930	A	G	0.6425	0.0359	0.0036	1.53E-22	++++
11	47873883	rs6485788	G	A	0.2098	0.0407	0.0042	1.19E-19	++++
11	48120936	rs4752894	G	A	0.3984	0.0206	0.0035	1.89E-09	++++
11	48167738	rs7947811	C	T	0.1689	0.0339	0.0044	2.34E-14	++++
11	49339071	rs11040329	C	T	0.1425	0.038	0.0054	5.46E-12	++++
11	51514678	rs139917442	C	T	0.896	-0.052	NA	6.5E-17	+---
11	55196302	rs11229606	G	T	0.128	0.0335	0.0051	3.12E-10	++++
11	61548559	rs509360	A	G	0.31	0.03	0.0054	1.84E-09	++++
11	61557803	rs102275	T	C	0.628	0.0391	0.0035	6.4E-28	++++
11	61604782	rs2524299	A	T	0.8456	0.0411	0.0048	3.89E-17	++++
11	61624414	rs174602	T	C	0.7929	0.0367	0.0055	5.72E-11	++++
11	61647387	rs174634	C	G	0.7309	0.024	0.004	1.08E-08	++++
11	65405600	rs2306363	T	G	0.1834	0.0227	0.0036	4.56E-10	++++
11	75455021	rs499974	C	A	0.8245	0.0263	0.0044	1.12E-08	++++
11	110012143	rs689183	T	G	0.7461	-0.0182	0.0031	3.96E-09	++++
11	116505440	rs10892001	G	A	0.5712	0.0211	0.0036	1.37E-08	++++
11	116519739	rs499790	C	T	0.8865	0.0576	0.0055	1.9E-21	+---
11	116526322	rs486394	A	C	0.7058	0.0266	0.0038	2.1E-10	++++
11	116529442	rs11820504	T	C	0.7968	0.035	0.0044	3.22E-16	++++
11	116532066	rs1145187	G	T	0.215	0.0306	0.0041	9.94E-13	++++
11	116557248	rs17092642	T	C	0.7836	0.0378	0.004	1.15E-20	++++
11	116590787	rs6589563	G	A	0.91821	0.0795	0.0062	6.92E-37	++++
11	116598988	rs180360	G	A	0.2599	0.0471	0.0039	5.74E-32	++++
11	116610294	rs61905084	C	T	0.1649	0.0425	0.0061	1.14E-10	++++
11	116633947	rs10488698	A	G	0.05409	0.061	0.0071	1.41E-15	+++-
11	116648917	rs964184	G	C	0.14	-0.095	NA	1.5E-68	++++
11	116670676	rs6589567	C	A	0.8628	0.0392	0.0058	2.18E-09	++++
11	116673768	rs1729409	A	G	0.4815	0.0274	0.0055	2.82E-08	++++
11	116728630	rs12225230	G	C	0.823	-0.055	NA	7.8E-29	++++
11	116734545	rs11216164	G	A	0.6398	0.0223	0.0038	1.16E-09	++++
11	117075566	rs508487	C	T	0.945	0.067	NA	1.5E-13	+---
11	117267884	rs573455	A	G	0.4697	0.0221	0.0034	2.52E-10	++++
11	122520291	rs1945391	A	T	0.5525	-0.0228	0.0028	1.6E-16	++++
11	126218541	rs17135399	A	G	0.93404	0.0483	0.0077	4.26E-09	++++
12	7725583	ss1388044873	A	G	0.8269	-0.026	0.0047	3.49E-08	----
12	20470199	rs11045171	A	G	0.8048	-0.0318	0.0036	2.27E-18	++++
12	20473758	rs7134375	C	A	0.566	-0.027	NA	1.6E-12	++++
12	26474867	rs10842708	A	G	0.6564	0.0183	0.0024	1.28E-14	++++
12	33459554	rs4551851	A	G	0.571	-0.0148	0.0025	2.58E-09	++++
12	57843711	rs2229357	G	A	0.774	-0.036	NA	2.2E-15	++++
12	57848639	rs3809114	A	G	0.5061	0.0177	0.0027	6.94E-11	++++
12	101873956	rs2373459	T	C	0.6796	0.0154	0.0023	9.3E-12	++++
12	109796637	rs12227736	A	G	0.3826	0.0301	0.0049	2.35E-08	++++
12	110015893	rs7954144	A	G	0.4301	-0.0273	0.0027	7.61E-24	++++
12	111904371	rs4766578	A	T	0.5425	0.0219	0.0028	1.14E-14	++++
12	117160976	rs10507274	T	C	0.9391	-0.0229	0.0041	1.84E-08	+---
12	122781897	rs11057405	G	A	0.90369	0.0412	0.0062	1.23E-09	+++-

12	123171218	rs2454722	G	A	0.1451	0.0351	0.0044	3.31E-14	++++
12	123344021	rs2271051	A	G	0.06069	0.049	0.0066	1.6E-11	++++
12	123796238	rs4759375	T	C	0.0919	0.0487	0.0048	1.67E-24	++++
12	123895906	rs28577594	G	C	0.291	0.03	NA	4.9E-12	++++
12	124475156	rs7307277	A	G	0.655	-0.037	NA	7.5E-21	++++
12	124505444	rs863750	C	T	0.403	0.034	NA	2.8E-19	++++
12	125259888	rs838876	A	G	0.3259	0.0493	0.0039	7.33E-33	++++
12	125261839	rs838883	T	C	0.09499	0.0485	0.0073	5.1E-11	++++
12	125283766	rs10773105	C	T	0.4828	0.0363	0.0035	3.2E-24	++++
12	125320155	rs7954519	T	G	0.7942	0.039	0.0049	1.99E-13	++++
12	125332955	rs10773111	T	C	0.4129	0.0246	0.0035	3.33E-11	++++
12	125338529	rs10773112	T	C	0.6429	0.039	0.0028	7.59E-43	++++
12	125351116	rs4379922	C	T	0.3496	0.0247	0.0036	9.56E-12	++++
12	125380232	rs7298751	G	A	0.1187	0.0434	0.0052	2.46E-16	++++
12	125439806	rs7959530	C	T	0.4248	0.0281	0.0048	4.05E-08	++++
14	65119839	rs7148864	A	G	0.796	-0.03	NA	6.8E-10	++++
14	74250126	rs13379043	T	C	0.6293	-0.0168	0.0029	1.17E-08	++++
14	105258892	rs2494748	T	C	0.5435	-0.0303	0.0029	3.31E-26	++++
15	58450274	rs10444840	G	A	0.5528	0.0195	0.0035	2.05E-08	++++
15	58525552	rs2414553	G	T	0.1319	0.035	0.005	6.85E-11	++++
15	58542197	rs4774292	C	T	0.5765	0.0226	0.0037	1.52E-08	++++
15	58558746	rs7179726	C	T	0.4842	0.022	0.0034	1.41E-09	++++
15	58579956	rs2899624	A	G	0.8456	0.0714	0.0049	1.39E-40	++++
15	58580525	rs12910051	G	A	0.1346	0.0508	0.0053	4E-20	++++
15	58611859	rs1373655	G	T	0.6913	0.0359	0.0039	3.65E-18	++++
15	58651632	rs16940126	C	T	0.8997	0.0529	0.006	2.23E-18	++++
15	58666679	rs185481	C	T	0.529	0.0366	0.0035	1.4E-23	++++
15	58671178	rs10152355	C	A	0.5567	0.0629	0.0049	5.74E-33	++++
15	58678512	rs10468017	T	C	0.2757	0.1179	0.0038	1.21E-188	++++
15	58678869	rs117901517	T	C	0.93668	0.0592	0.0083	4.3E-11	+---
15	58682690	rs34718390	A	G	0.05145	0.1008	0.0103	1.8E-19	++++
15	58686754	rs7164909	C	T	0.91953	0.0715	0.0066	5.06E-24	++++
15	58687524	rs16940181	C	A	0.157	0.0817	0.0049	1.29E-52	++++
15	58693860	rs487766	C	T	0.186	0.0855	0.004	1.87E-93	++++
15	58710627	rs11071380	C	A	0.5778	0.0759	0.0038	4.09E-86	++++
15	58717428	rs16940262	C	T	0.4881	0.0259	0.0041	1.49E-08	++++
15	58723479	rs1077834	C	T	0.2111	0.1253	0.0041	7.77E-180	++++
15	58730889	rs12914035	A	G	0.8325	0.0492	0.0049	3.86E-22	++--
15	58742731	rs11858164	T	G	0.4749	0.0594	0.0053	8.04E-28	++++
15	58751877	rs936960	T	G	0.09631	0.0414	0.0064	1.42E-10	++++
15	58884972	rs11637365	T	A	0.94327	0.0501	0.0079	3.44E-09	++++
15	61948435	rs2245477	A	C	0.4047	-0.0136	0.0024	1.16E-08	++++
15	63396867	rs2652834	G	A	0.7652	0.0285	0.0043	3.59E-11	++++
16	15172118	rs11644601	T	C	0.703	-0.023	NA	0.00000001	++++
16	53818460	rs3751812	T	G	0.3619	-0.0253	0.0029	1.88E-18	++++
16	56363528	rs3790106	C	G	0.81	0.0374	0.0052	3.27E-11	++++
16	56387000	rs4784659	T	C	0.1847	0.0274	0.0049	1.02E-08	++++
16	56626769	rs9938618	G	A	0.06596	0.0576	0.0083	1.44E-11	++++
16	56690858	rs8044791	C	T	0.1306	0.0339	0.0053	2.14E-09	++++
16	56735782	rs12928598	A	G	0.2388	0.0379	0.0043	2.48E-17	++++
16	56778067	rs7193072	A	G	0.2375	0.0498	0.0038	1.4E-34	++++
16	56852311	rs1561138	C	A	0.8034	0.0376	0.0042	5.18E-17	++++
16	56866196	rs2241770	T	C	0.8971	0.0989	0.0057	6.78E-60	++++
16	56926195	rs13306677	A	G	0.09894	0.09	0.0057	1.35E-50	++++
16	56940513	rs3794650	T	C	0.8338	0.0687	0.005	9.84E-41	+---
16	56942709	rs7204044	A	G	0.2137	0.0388	0.004	6.46E-20	++++

16	56942921	rs1138429	A	T	0.90237	0.1156	0.0065	9.52E-66	+---
16	56968039	rs7204290	G	A	0.6979	0.0302	0.0038	1.48E-14	++++
16	56984590	rs9938160	C	T	0.252	0.0599	0.0053	3.17E-25	++++
16	56984763	rs247615	A	G	0.781	0.0764	0.0044	2.94E-62	++++
16	56985156	rs193695	G	A	0.6398	0.1415	0.0051	2.32E-145	++++
16	56992017	rs6499863	G	A	0.8417	0.0862	0.005	9.75E-63	++++
16	56993025	rs12920974	G	T	0.6847	0.1341	0.0052	3.04E-124	++++
16	56994894	rs4783961	A	G	0.4855	0.0997	0.0036	5.73E-162	++++
16	56995038	rs4783962	C	T	0.7678	0.075	0.0041	4.6E-74	++++
16	56999328	rs11508026	T	C	0.4142	0.1948	0.0051	0	++++
16	57000938	rs118146573	G	A	0.883	0.224	NA	0	++++
16	57003146	rs11076174	T	C	0.8958	0.1797	0.0075	2.28E-127	++++
16	57007353	rs5883	C	T	0.946	-0.109	NA	3.2E-35	++++
16	57009941	rs289719	T	C	0.3285	0.1129	0.0039	5.37E-173	++++
16	57015091	rs5880	G	C	0.94063	0.3071	0.009	1.37E-233	+---
16	57019392	rs12720917	C	T	0.1412	0.0976	0.0055	5.89E-68	+++
16	57019532	rs289745	A	C	0.6029	0.0276	0.0041	2.28E-20	++++
16	57021433	rs12934552	A	G	0.8734	0.0541	0.0054	8.71E-24	++++
16	57025063	rs289748	A	G	0.5158	0.0387	0.005	6.63E-17	++++
16	57032461	rs7198642	G	T	0.1675	0.0352	0.0043	3.06E-14	++++
16	57033696	rs1875236	A	G	0.09763	0.059	0.0065	1.45E-18	++++
16	57034645	rs1991515	T	C	0.4565	0.0225	0.0037	5.62E-10	++++
16	57036440	rs7499911	G	A	0.06464	0.06	0.0111	1.26E-08	+---
16	57050348	rs17370142	T	G	0.1161	0.0342	0.0059	1.19E-11	++++
16	57052901	rs12446867	G	T	0.7427	0.0344	0.0042	1.83E-16	++++
16	57061189	rs291040	T	C	0.6623	0.0305	0.0037	8.21E-17	++++
16	57065121	rs16965220	A	C	0.2982	0.0219	0.0037	7.91E-09	++++
16	57074451	rs289726	T	C	0.3522	0.0364	0.0037	1.27E-22	++++
16	57080528	rs289723	C	A	0.748	0.022	0.0038	4.08E-09	++++
16	57116036	rs150348	A	C	0.372	0.0232	0.0035	7.41E-10	++++
16	57141666	rs4783972	C	A	0.4129	0.022	0.0036	1.43E-09	++++
16	67207933	rs2233455	T	C	0.06464	0.0567	0.0066	2.27E-14	++++
16	67655133	rs7191281	C	T	0.1253	0.0497	0.0052	2.56E-20	++++
16	67863451	rs3743733	C	T	0.4868	0.027	0.0036	8.65E-13	++++
16	67942320	rs56070533	A	G	0.1512	0.0779	0.0038	8.82E-95	++++
16	68409435	rs2863973	C	A	0.1821	0.0471	0.0044	1.1E-22	++++
16	81534790	rs2925979	T	C	0.2955	-0.0309	0.0029	6.14E-27	++++
17	486821	rs12938449	A	C	0.1814	-0.018	0.0032	1.16E-08	++++
17	37722515	rs7503195	A	G	0.4142	0.0219	0.0037	1.64E-08	++++
17	37746359	rs11078917	A	C	0.3803	-0.0336	0.0029	3.41E-30	++++
17	37921742	rs907091	C	T	0.5211	0.0248	0.0034	1.61E-13	++++
17	37949924	rs17676191	A	G	0.91161	0.037	0.0062	8.89E-09	+++
17	45766771	rs56325564	A	G	0.4569	0.0148	0.0027	4.45E-08	++++
17	65892507	rs61676547	C	G	0.3144	-0.0208	0.0031	3.01E-11	++++
17	66882466	rs4148005	T	G	0.7005	0.0283	0.0036	5.74E-14	++++
17	76400329	rs12601079	A	G	0.6042	0.0334	0.0027	7.61E-35	++++
18	21161134	rs1788783	T	C	0.504	0.0158	0.0021	7.99E-14	++++
18	47033207	rs12963212	C	T	0.5594	0.0218	0.0035	8.56E-10	++++
18	47086998	rs4245232	C	A	0.7718	0.0369	0.0061	6.84E-09	++++
18	47093864	rs2000813	T	C	0.2902	0.0401	0.0039	1.08E-23	++++
18	47097398	rs8093249	A	G	0.8404	0.0384	0.0051	1.8E-13	++++
18	47126172	rs9955201	A	G	0.06069	0.0638	0.0081	2.4E-14	++++
18	47138066	rs7241596	T	C	0.3417	0.0261	0.0035	1.12E-13	++++
18	47147746	rs1105654	A	G	0.628	0.0481	0.0036	1.84E-38	+++
18	47148299	rs7229377	T	C	0.2216	0.045	0.0044	2.67E-21	++++
18	47148886	rs73959582	C	T	0.1372	0.0674	0.0075	5.63E-17	++++

18	47149371	rs7235005	A	G	0.4987	0.0316	0.0035	1.11E-18	++++
18	47154779	rs56339947	C	T	0.09235	0.0543	0.009	4.11E-08	+---
18	47161733	rs4939881	C	T	0.5818	0.0417	0.005	3.59E-16	++++
18	47162207	rs7228412	G	A	0.2045	0.0298	0.0043	5.97E-11	++++
18	47164375	rs12965544	G	A	0.252	0.0263	0.0039	4.56E-11	++++
18	47167214	rs4939883	C	T	0.8193	0.0799	0.0045	1.8E-66	++++
18	47182838	rs1943969	A	G	0.3364	0.0272	0.0037	2.52E-13	++++
18	47192294	rs882617	C	A	0.91689	0.0358	0.0061	3.27E-08	++++
18	47243912	rs6507945	C	A	0.5646	0.0441	0.0034	1.33E-34	++++
18	47249297	rs8088428	A	G	0.8668	0.0376	0.0052	4.56E-13	++++
18	47258695	rs4939890	G	A	0.91293	0.0549	0.0059	5.09E-19	++++
18	47261744	rs3892138	C	A	0.3008	0.0396	0.004	3.16E-21	++++
18	47275339	rs8087313	C	T	0.07916	0.0462	0.0068	3.4E-11	++++
18	47278345	rs2040293	A	G	0.2559	0.0438	0.0039	7.87E-28	++++
18	47394395	rs578211	C	A	0.7467	0.022	0.0038	1.48E-08	++++
18	47457559	rs1787328	C	T	0.4617	0.0411	0.0037	2.3E-26	++++
18	47482530	rs13381727	T	C	0.1201	0.0337	0.0059	2.09E-09	++++
18	57829135	rs6567160	T	C	0.7691	0.0257	0.0041	2.92E-09	++++
18	57942799	rs9956279	C	T	0.7269	0.0214	0.0038	4.91E-08	++++
19	3414088	rs12975319	A	G	0.3003	-0.0143	0.0024	1.23E-09	++++
19	7242261	rs56149994	T	C	0.2862	-0.0229	0.0031	1.18E-13	++++
19	8431581	rs2278236	A	G	0.5435	0.0331	0.0035	3.19E-18	++++
19	8467235	rs2913968	T	C	0.7243	0.0278	0.0039	1.82E-12	++++
19	8503025	rs3815783	A	G	0.3509	0.0321	0.0046	1.57E-10	++++
19	8610894	rs3111576	T	C	0.1372	0.0448	0.0054	1.2E-14	++++
19	11350488	rs2278426	T	C	0.1249	-0.0756	0.0049	9.66E-53	++++
19	33896432	rs4805881	A	C	0.341	-0.028	NA	1.3E-10	++++
19	45242173	rs1531517	A	G	0.05145	0.044	0.0074	2.43E-08	++++
19	45329214	rs10402271	T	G	0.6596	0.0205	0.0035	6.15E-09	++++
19	45333834	rs4803760	T	C	0.1953	0.026	0.0046	4.84E-08	++++
19	45395266	rs157580	G	A	0.3799	0.0297	0.0042	9.88E-12	++++
19	45411941	rs429358	T	C	0.8416	0.093	0.0037	1.26E-142	++++
19	45412079	rs7412	C	T	0.916	-0.079	NA	4.6E-29	++++
19	45439163	rs35136575	G	C	0.2282	0.0361	0.0055	1.22E-09	++++
19	45448465	rs5167	T	G	0.643	-0.035	NA	5.1E-19	++++
19	50161091	rs61743199	A	G	0.933	0.0343	0.0057	1.96E-09	+---
19	52304069	rs74256604	A	G	0.1298	-0.0284	0.0043	3.12E-11	++++
19	52324216	rs17695224	G	A	0.7612	0.029	0.0039	2.42E-13	++++
19	54785593	rs380573	G	A	0.7876	0.0331	0.0044	1.1E-12	++++
19	54799083	rs380267	A	G	0.805	-0.0622	0.0035	4.24E-71	++++
19	54810370	rs4806741	G	A	0.2348	0.0299	0.0045	1.72E-10	++++
19	54827040	rs1645784	C	A	0.08443	0.0639	0.0105	6.22E-11	++++
19	54837165	rs12979085	A	G	0.2889	0.0415	0.0039	6.03E-23	++++
20	30184866	rs6120815	T	C	0.7246	-0.015	0.0027	1.85E-08	++++
20	33719183	rs3746428	A	G	0.1592	-0.024	0.0038	2.84E-10	++++
20	43038249	rs6031587	C	T	0.9314	0.0488	0.0074	1.92E-09	++++
20	44538427	rs378114	T	C	0.2388	0.0294	0.0039	1.29E-13	++++
20	44585420	rs4465830	A	G	0.7982	0.0597	0.0044	5.18E-40	++++
20	44585793	rs13040315	G	A	0.4367	0.0194	0.0034	2.85E-08	++++
20	44632367	rs6065912	G	A	0.8417	0.0384	0.005	1.28E-14	++++
20	44714510	rs6065921	A	G	0.8127	0.0266	0.0042	7.62E-10	++++
20	46290250	rs2281279	T	C	0.7201	-0.0183	0.0026	1.24E-12	++++
20	51263786	rs856404	A	G	0.6427	-0.0131	0.0022	3.39E-09	++++
21	36343552	rs2834707	T	C	0.3612	-0.0151	0.0025	7.5E-10	++++
21	46271452	rs235314	T	C	0.4952	-0.0174	0.0028	3.59E-10	++++
22	21976934	rs7444	T	C	0.7049	0.034	0.0031	1.01E-28	++++

22	29400515	rs8142788	A	G	0.1559	-0.023	0.004	1.16E-08	+--+
22	38594668	rs2899297	A	G	0.5479	-0.0225	0.0027	9.89E-17	++++
22	44340904	rs2294915	T	C	0.246	-0.0177	0.0032	2.81E-08	++++
23	14860103	rs138331350	G	A	0.942	-0.048	NA	2.6E-11	----

\* Indicates whether the SNP was present in each genetic study included in this analysis. (+) and (-) indicate the SNP is present or absent, respectively. The order of the studies is UK Biobank, GOCHA, ISGC ICH and GERFHS.

Supplementary Table 4: SNPs used in the polygenic risk score of triglycerides.

Chr	Pos	rsid	EA	NEA	EAF	Beta	se	P	SNP Present in Study*
1	11838451	rs55738118	T	C	0.1089	-0.0208	0.0037	0.000000016	++++
1	27138393	rs12748152	T	C	0.07124	0.0372	0.0059	1.1E-09	----
1	40003410	rs72663520	T	C	0.2135	0.0225	0.0036	3.092E-10	++++
1	50889255	rs1278530	A	G	0.5078	-0.016	0.0023	8E-12	++++
1	62836976	rs6587971	C	T	0.442	0.0191	0.0038	6.577E-09	++++
1	62853146	rs369679376	A	G	0.1517	0.0303	0.0047	3.221E-10	----
1	62861261	rs12123703	A	G	0.94327	0.0643	0.0095	3.54E-09	----
1	62953373	rs10493326	A	G	0.2467	0.0311	0.0039	2.004E-15	++++
1	62995263	rs12039115	C	T	0.8905	0.0471	0.0051	6.535E-21	++++
1	63133930	rs4587594	G	A	0.69	0.0694	0.0035	3.503E-82	++++
1	63193972	rs2149116	A	G	0.3179	0.031	0.005	1.029E-09	++++
1	63231401	rs11807368	T	G	0.4261	0.0312	0.0035	1.791E-18	++++
1	63252766	rs6587988	C	T	0.8628	0.0432	0.0045	3.068E-21	++++
1	63375116	rs2780879	C	T	0.9248	0.0469	0.0067	6.466E-11	++++
1	72839774	rs2613503	A	C	0.8334	0.0178	0.0028	2.4E-10	++++
1	172349246	rs7519429	A	C	0.625	0.026	NA	1.6E-09	++++
1	203518382	rs2821231	T	C	0.4417	0.0146	0.0025	3.45E-09	++++
1	205130413	rs3851294	A	G	0.0913	-0.0201	0.0034	4.25E-09	++++
1	219734960	rs2820441	A	C	0.707	0.0256	0.0031	7.633E-17	++++
1	230287128	rs1998064	T	G	0.7533	0.0211	0.0038	4.855E-08	++++
1	230291868	rs2352723	T	C	0.1873	0.0316	0.0043	2.334E-12	++++
1	230297136	rs2281721	T	C	0.5522	-0.0377	0.0028	1.476E-40	++++
2	21125742	rs4468779	C	T	0.2573	0.0268	0.0039	3.133E-11	++++
2	21138066	rs9306897	T	C	0.3034	0.0255	0.0035	1.82E-12	++++
2	21141323	rs6755762	G	A	0.4235	0.0283	0.0033	4.703E-17	++++
2	21213062	rs6722374	T	G	0.4288	0.0323	0.0033	1.906E-20	----
2	21231524	rs676210	G	A	0.7691	0.0733	0.0039	3.284E-71	++++
2	21232804	rs1041968	G	A	0.511	-0.051	NA	1E-35	++++
2	21278773	rs934198	G	T	0.677	-0.026	NA	2.9E-09	++++
2	21389659	rs4635554	G	T	0.3061	0.0228	0.0038	2.007E-08	++++
2	27420690	rs1659685	T	C	0.7243	0.0503	0.0036	8.691E-40	++++
2	27642734	rs11675428	A	C	0.8338	0.0457	0.0043	5.244E-25	++--
2	27706640	rs2272417	T	C	0.595	0.0497	0.0035	1.026E-44	++++
2	27730940	rs1260326	T	C	0.379	0.1118	0.0028	1E-300	++++
2	27731212	rs3817588	T	C	0.7889	0.0674	0.0042	1.295E-55	++--
2	27860258	rs2141371	A	G	0.6939	0.0605	0.0041	9.2E-49	++++
2	27895073	rs2178198	T	C	0.1306	0.0795	0.005	1.039E-55	++++
2	27927968	rs71441090	A	G	0.08311	0.0778	0.0097	7.021E-15	----
2	27933642	rs4616435	T	C	0.2243	0.0776	0.0041	4.406E-73	++++
2	27995781	rs3736594	C	A	0.7269	0.0518	0.0037	4.972E-42	++++
2	28203294	rs898031	C	T	0.6834	0.0288	0.0035	6.377E-15	++++
2	28323869	rs6547829	T	C	0.09499	0.0551	0.0056	7.445E-20	++++
2	28371475	rs6707039	G	A	0.0686	0.0448	0.0064	1.179E-11	++++
2	28421381	rs11891642	T	C	0.2454	0.0253	0.004	3.47E-09	++++
2	28421461	rs4666042	A	G	0.7388	0.0331	0.0039	8.583E-17	++++
2	28421473	rs55807911	C	T	0.2124	0.0363	0.0057	4.123E-10	++++
2	28443050	rs7349418	C	T	0.4472	0.0386	0.0034	1.063E-28	++++
2	28523995	rs12621972	C	T	0.2203	0.0244	0.0041	6.737E-09	++++
2	28531903	rs13031756	G	A	0.4842	0.0198	0.0033	8.838E-09	++++
2	28556890	rs10865494	A	C	0.09235	0.0422	0.0058	3.518E-12	++++
2	28652529	rs4666076	G	A	0.6649	0.0226	0.0035	4.631E-09	++++
2	28662228	rs10174692	A	G	0.2348	0.0248	0.0041	3.613E-09	++++
2	43747854	rs202032561	T	C	0.1315	-0.0331	0.0051	1.096E-10	++++

2	58933591	rs1861410	T	C	0.5536	-0.0146	0.0023	4.16E-10	++++
2	65276049	rs1009360	T	C	0.565	0.026	NA	6.1E-10	++++
2	66680892	rs1519104	A	G	0.6821	-0.016	0.0025	2.02E-10	++++
2	111868691	rs77004761	T	A	0.886	0.038	NA	8.4E-09	----
2	146347459	rs6430090	A	G	0.3706	0.0161	0.0024	2.48E-11	++++
2	165508389	rs10184004	T	C	0.453	-0.0309	0.0028	2.647E-29	++++
2	165551201	rs7607980	T	C	0.873	0.049	NA	1.3E-15	++++
2	219699999	rs78058190	G	A	0.948	-0.072	NA	1.5E-14	----
2	227107501	rs1913657	T	C	0.6215	0.0433	0.0028	2.277E-55	++++
2	239896861	rs10199914	A	G	0.6285	-0.0112	0.0019	3.54E-09	++++
3	12173655	rs34831171	T	C	0.7997	0.0246	0.0038	6.929E-11	++++
3	12486964	rs10440120	C	A	0.8325	0.0306	0.0044	5.343E-11	++++
3	12489342	rs17819328	G	T	0.4261	0.0232	0.0035	2.889E-10	++++
3	36979042	rs6777217	A	G	0.4742	0.0101	0.0018	4.76E-08	++++
3	135926622	rs645040	T	G	0.7691	0.0293	0.004	1.83E-12	++++
3	142657205	rs2354167	T	G	0.4443	0.0144	0.0024	1.96E-09	++++
3	155547274	rs382534	T	C	0.2379	0.0149	0.0025	1.85E-09	++++
3	156795414	rs9817452	T	G	0.3753	-0.0292	0.0029	4.128E-23	++++
3	170739663	rs11720145	A	G	0.2337	0.0223	0.003	1.03E-13	++++
4	852313	rs1564282	T	C	0.0934	0.0224	0.0033	1.2E-11	++++
4	3443931	rs13108218	A	G	0.4233	0.0234	0.0028	1.163E-16	++++
4	3473139	rs6831256	G	A	0.409	0.0258	0.0035	1.602E-12	++++
4	69367872	rs2603151	A	G	0.3612	0.0168	0.0028	9.938E-10	++++
4	87279096	rs2869433	T	C	0.3074	0.0192	0.0034	4.585E-08	++++
4	87873164	rs1992876	A	G	0.81	0.0269	0.0041	2.788E-10	++++
4	88018991	rs2035403	A	G	0.601	-0.038	NA	5.1E-19	++++
4	88057353	rs1408	A	G	0.6123	0.0305	0.0028	8.385E-28	++++
4	88082177	rs4693158	G	A	0.8034	0.0281	0.0041	4.729E-10	++++
4	88163094	rs7688657	C	G	0.3984	0.0272	0.0033	7.184E-14	++++
4	88199484	rs6531968	T	G	0.5369	0.0283	0.0047	4.62E-08	++++
4	89741269	rs3822072	G	A	0.528	-0.025	NA	2.1E-09	++++
4	100042221	rs6532795	T	C	0.2812	-0.0168	0.003	1.164E-08	++++
4	104174843	rs200911786	A	C	0.1523	-0.0251	0.0043	5.972E-09	++++
5	55806751	rs459193	A	G	0.2968	-0.0324	0.0029	9.227E-29	++++
5	55861786	rs9686661	C	T	0.801	-0.045	NA	4.2E-18	++++
5	118729286	rs1045241	T	C	0.2937	-0.0154	0.0024	5.75E-11	++++
5	132444301	rs11745702	T	C	0.7608	0.0193	0.0034	9.665E-09	++++
5	156394441	rs9715911	A	G	0.6039	0.035	0.0027	5.459E-38	++++
5	156466179	rs1501909	T	G	0.372	0.026	0.0036	8.875E-11	++++
5	158007165	rs2914228	T	C	0.3265	0.024	0.0027	1.86E-19	++++
6	20506815	rs12206516	A	G	0.8218	0.0154	0.0028	2.36E-08	++++
6	28793904	rs3118359	T	G	0.0838	-0.0378	0.0052	2.584E-13	----
6	36645696	rs2395655	A	G	0.5474	0.0147	0.0021	6.92E-12	++++
6	43757896	rs998584	A	C	0.4455	0.0431	0.0028	2.043E-54	++++
6	86662267	rs12208493	T	C	0.707	-0.0134	0.0023	4.01E-09	++++
6	127184987	rs13198641	A	T	0.6356	0.0208	0.003	4.228E-12	++++
6	127436064	rs1936800	C	T	0.487	-0.024	NA	0.000000016	++++
6	127454893	rs72959041	G	A	0.942	-0.058	NA	3.5E-10	----
6	139837429	rs573454216	A	G	0.5604	-0.0262	0.0028	2.048E-21	----
6	160543148	rs12208357	C	T	0.925	-0.046	NA	8.9E-09	----
6	160848167	rs2665357	C	A	0.5092	0.0212	0.0033	8.327E-10	++++
6	160964135	rs41265930	T	C	0.9445	-0.0488	0.0067	3.528E-13	----
6	164092291	rs4709741	A	C	0.1249	-0.022	0.004	2.76E-08	++++
7	12269417	rs3173615	C	G	0.5296	-0.0113	0.0019	6.51E-09	++++
7	15941283	rs38246	T	C	0.2494	0.0164	0.0027	9.8E-10	++++
7	17817037	rs2723509	A	G	0.4843	0.0163	0.0028	6.958E-09	++++



7	25935747	rs73081656	A	C	0.3342	-0.0186	0.0031	1.929E-09	++++
7	25939161	rs2122823	T	C	0.2177	0.0241	0.004	8.61E-09	++++
7	25991826	rs4722551	T	C	0.8298	0.0267	0.0044	1.583E-09	++++
7	25997536	rs4719841	G	A	0.3826	0.0232	0.0034	8.864E-11	++++
7	44205906	rs2971672	A	C	0.5854	-0.0178	0.0028	2.549E-10	++++
7	72804412	rs799303	T	G	0.872	0.0302	0.0048	3.815E-09	++++
7	72861849	rs2237279	C	T	0.4776	0.0326	0.0035	2.567E-21	++++
7	73019074	rs799158	T	C	0.05145	0.102	0.013	4.11E-14	++++
7	73025975	rs13234131	A	G	0.8853	0.1275	0.0043	3.97E-191	++++
7	73060006	rs799160	T	C	0.5211	0.0398	0.0036	5.459E-30	++++
7	73097654	rs1128349	C	T	0.5528	0.0261	0.0036	8.996E-12	++++
7	93083588	rs2299247	T	G	0.513	0.024	NA	0.00000002	++++
7	116358044	rs38855	A	G	0.5264	0.0187	0.0033	2.109E-08	++++
7	130433384	rs4731702	C	T	0.518	0.03	NA	2.4E-13	++++
7	130445981	rs1364422	T	C	0.2731	0.0221	0.0037	9.265E-09	++++
7	150531275	rs73165526	T	C	0.9169	-0.0306	0.0051	2.055E-09	----
8	8363683	rs2980755	A	G	0.5437	0.0209	0.0033	1.475E-10	++++
8	9183207	rs17149760	G	A	0.7546	0.0216	0.0038	4.186E-08	++++
8	9669775	rs10104807	A	G	0.6544	0.0212	0.0035	2.592E-08	++++
8	10491684	rs4455790	C	G	0.283	0.033	NA	4.8E-11	++++
8	10643164	rs9657541	T	C	0.1885	0.0305	0.0034	1.076E-19	++++
8	10710715	rs12546026	C	A	0.4406	0.0213	0.0034	1.632E-10	++++
8	11433909	rs2898290	C	T	0.5422	0.0215	0.0035	5.32E-09	++++
8	11616410	rs1062219	T	C	0.4921	0.0223	0.0034	1.686E-09	++++
8	11702313	rs709822	C	G	0.7117	-0.0212	0.0029	4.603E-13	++++
8	18259876	rs11780610	T	C	0.7089	-0.0362	0.0029	1.766E-35	++++
8	19507270	rs7001715	G	T	0.2111	0.0263	0.0043	1.95E-08	++++
8	19514934	rs4628268	T	C	0.5224	0.0215	0.0033	1.641E-09	++++
8	19576448	rs10085966	C	T	0.5409	0.03	0.0037	1.151E-13	++++
8	19605966	rs12544497	A	G	0.8483	0.0339	0.0044	2.147E-12	++++
8	19621333	rs17410086	T	C	0.90369	0.0326	0.0054	2.008E-09	----
8	19626120	rs7837390	C	T	0.3931	0.0263	0.0034	2.283E-13	++++
8	19650333	rs11204072	T	C	0.847	0.0379	0.0044	1.084E-16	++++
8	19709575	rs4599828	C	T	0.533	0.0241	0.0034	1.59E-11	++++
8	19715236	rs6586872	G	A	0.7441	0.0339	0.0038	4.086E-19	++++
8	19727047	rs1441778	T	C	0.8549	0.0553	0.0078	6.77E-13	++++
8	19738260	rs6586876	G	A	0.3865	0.0248	0.0034	7.522E-13	++++
8	19748603	rs7844579	C	T	0.5264	0.0215	0.0034	2.998E-10	++++
8	19749390	rs3898938	C	T	0.5607	0.0244	0.0034	1.219E-12	++++
8	19757300	rs1441771	C	T	0.8364	0.0669	0.0043	1.605E-50	++++
8	19799641	rs1534649	G	T	0.5515	0.028	0.0035	1.745E-15	++++
8	19811901	rs255	T	C	0.8641	0.0962	0.0047	1.27E-91	++++
8	19815098	rs283	T	C	0.2348	0.037	0.0044	1.704E-16	++++
8	19817997	rs312	G	C	0.8799	0.0398	0.005	4.927E-17	++++
8	19824492	rs13702	T	C	0.6873	0.1069	0.0037	6.56E-187	++++
8	19830170	rs1569209	T	G	0.9206	0.2112	0.0053	1E-300	+++
8	19854773	rs2410622	T	C	0.1438	0.0537	0.0051	1.203E-26	++++
8	19858330	rs10108800	T	C	0.2361	0.0213	0.0038	1.138E-08	++++
8	19859120	rs4490856	T	C	0.4208	0.0605	0.0034	1.64E-71	++++
8	19874153	rs4922119	C	T	0.5501	0.0708	0.0034	1.67E-95	++++
8	19890654	rs4557718	C	T	0.1266	0.0578	0.0059	3.264E-24	----
8	19891227	rs28526159	C	T	0.317	0.058	NA	6E-39	++++
8	19928013	rs6999158	T	A	0.708	0.085	NA	2.9E-79	++++
8	19942181	rs13263508	G	T	0.4301	0.0517	0.0034	3.383E-48	++++
8	19968929	rs16842	C	T	0.2533	0.0274	0.0037	6.325E-13	++++
8	22457804	rs746011	T	C	0.3037	0.0173	0.0027	1.79E-10	++++

8	59392324	rs9297994	A	G	0.6906	-0.0227	0.003	8.074E-14	++++
8	72469742	rs4738141	A	G	0.6374	-0.0149	0.0025	1.32E-09	++++
8	118184783	rs13266634	T	C	0.2822	-0.0134	0.0021	9.56E-11	++++
8	126444788	rs2980874	G	A	0.6253	0.034	0.0044	1.685E-12	++++
8	126449406	rs17405319	T	C	0.1636	0.0387	0.0047	1.884E-16	++++
8	126452509	rs72647352	C	T	0.1623	0.0445	0.0064	5.411E-11	----
8	126465305	rs17730649	A	C	0.4024	0.0436	0.0034	3.774E-34	++++
8	126471577	rs4871601	G	A	0.05541	0.059	0.0079	3.35E-14	++++
8	126474356	rs2980884	G	A	0.3681	0.0539	0.0036	3.898E-46	++++
8	126490498	rs58253018	A	T	0.3738	0.0984	0.0034	1.98E-182	++++
8	126500350	rs8180991	G	C	0.2309	0.0317	0.004	6.818E-14	++++
8	126506694	rs112875651	G	A	0.62	0.09	NA	2.5E-91	++++
8	126514676	rs7012891	C	T	0.2296	0.0408	0.0039	9.204E-24	++++
8	126541659	rs1809167	G	A	0.1095	0.0387	0.0055	1.077E-11	++++
8	126629328	rs4871624	G	T	0.2652	0.0254	0.0037	1.07E-11	++++
9	33787871	rs3843935	T	C	0.3916	0.0155	0.0024	5.54E-11	++++
9	86617265	rs1982151	A	G	0.2953	-0.0115	0.002	1.82E-08	++++
9	107664301	rs1883025	C	T	0.738	0.028	NA	4.5E-09	++++
10	5254847	rs1832007	A	G	0.8681	0.0327	0.0047	1.718E-12	++++
10	65203808	rs3999089	A	G	0.513	0.039	NA	2E-20	++++
10	70346740	rs2298117	T	C	0.4895	0.0111	0.0018	1.59E-09	++++
10	74703849	rs12257692	T	C	0.799	-0.0283	0.0047	1.261E-09	++++
10	94839642	rs2068888	A	G	0.4268	-0.0296	0.0027	2.73E-28	++++
10	103928374	rs17779355	A	G	0.0578	-0.0292	0.0046	2.97E-10	----
10	112097073	rs963059	T	C	0.7967	-0.0167	0.003	4.21E-08	++++
10	113921354	rs2250802	A	G	0.6807	0.023	0.0037	1.21E-10	++++
10	134459388	rs1133400	A	G	0.7981	-0.0131	0.0023	2.24E-08	++++
11	27675712	rs1519480	T	C	0.5941	-0.016	0.0022	6.82E-13	++++
11	47286290	rs7120118	T	C	0.6572	0.0275	0.0028	9.893E-23	++++
11	61548559	rs509360	G	A	0.69	0.0433	0.0052	4.203E-17	++++
11	61552680	rs174537	T	G	0.312	0.0617	0.0031	1.565E-86	++++
11	61603358	rs2727271	T	A	0.1464	0.0498	0.0049	2.381E-21	----
11	61624414	rs174602	C	T	0.2071	0.0289	0.0052	4.147E-08	++++
11	61647288	rs7942717	G	A	0.09763	0.0393	0.0067	1.112E-08	++++
11	61656182	rs174456	C	A	0.2665	0.0239	0.0038	1.026E-09	++++
11	65483370	rs75601653	C	G	0.6799	-0.0171	0.003	2.064E-08	++++
11	78099014	rs10793310	T	G	0.8332	0.0193	0.0029	3.29E-11	++++
11	113296619	rs1079596	T	C	0.1767	0.0141	0.0025	1.79E-08	++++
11	116496360	rs1240658	C	T	0.1478	0.0346	0.0046	3.012E-12	++++
11	116514417	rs10892004	T	C	0.1359	0.0557	0.0082	1.069E-11	++++
11	116521748	rs3016352	A	G	0.5818	0.0343	0.005	5.767E-10	++++
11	116523931	rs3017778	T	C	0.1135	0.116	0.0056	8.572E-87	----
11	116526322	rs486394	C	A	0.2942	0.0665	0.0038	2.817E-60	++++
11	116529024	rs7104343	C	T	0.8826	0.0431	0.0054	2.152E-15	++++
11	116529442	rs11820504	C	T	0.2032	0.0604	0.0044	1.095E-39	++++
11	116532856	rs1145189	G	A	0.7863	0.0466	0.0041	1.076E-25	++++
11	116535126	rs2105610	C	T	0.1003	0.0486	0.0073	5.814E-09	++++
11	116571250	rs1145195	G	A	0.5409	0.0469	0.0033	1.771E-41	++++
11	116584987	rs4938303	C	T	0.2757	0.1071	0.0037	3.42E-166	++++
11	116586283	rs7350481	T	C	0.0708	0.2272	0.0055	1E-300	++++
11	116598988	rs180360	A	G	0.7401	0.0573	0.0038	1.083E-48	++++
11	116610294	rs61905084	T	C	0.8351	0.0563	0.0059	2.548E-20	++++
11	116624703	rs180326	G	T	0.3628	0.0839	0.0036	6.27E-108	++++
11	116635784	rs2187126	A	G	0.94591	0.0543	0.0069	2.903E-15	----
11	116637146	rs12294259	T	C	0.05937	0.219	0.0069	1.79E-200	++++
11	116677723	rs1263167	A	G	0.8193	0.0423	0.0049	5.593E-17	++++

11	116691634	rs5110	A	C	0.06464	0.156	0.0124	2.137E-34	+---
11	116724232	rs888246	T	C	0.08179	0.0707	0.0058	8.987E-31	++++
11	116730638	rs6589574	A	G	0.1214	0.1283	0.0054	3.03E-113	++++
11	116734545	rs11216164	G	A	0.6398	0.0335	0.0036	2.124E-17	++++
11	116896155	rs10892063	A	C	0.3641	0.0608	0.0035	3.521E-61	++++
11	117118712	rs7928525	T	A	0.2005	0.0345	0.0043	5.204E-14	++++
12	20474706	rs79719909	A	G	0.797	0.042	NA	2.1E-16	++++
12	21331549	rs4149056	T	C	0.8516	-0.0335	0.0039	1.638E-17	++++
12	26453283	rs718314	A	G	0.7408	-0.0177	0.0023	8.57E-15	++++
12	46200396	rs7316454	T	G	0.1789	0.019	0.0029	5.61E-11	+--+
12	57844049	rs3741414	C	T	0.774	0.043	NA	5.3E-18	++++
12	124475156	rs7307277	A	G	0.655	0.038	NA	3.7E-18	++++
12	124505444	rs863750	C	T	0.403	-0.03	NA	1.6E-12	++++
12	125312425	rs10846744	C	G	0.3084	0.0252	0.0033	2.663E-14	++++
13	95248566	rs2298058	T	C	0.3135	0.0245	0.0026	2.55E-20	++++
13	114547372	rs6602911	T	C	0.4294	0.0216	0.0028	9.993E-15	++++
14	65119839	rs7148864	A	G	0.796	0.033	NA	2.7E-10	++++
14	104290813	rs12893623	A	G	0.6853	-0.0172	0.0029	2.509E-09	++++
15	39464167	rs7176058	A	G	0.7559	0.0152	0.0027	1.21E-08	++++
15	41057507	rs72735627	T	C	0.0672	-0.0362	0.0066	3.759E-08	+---
15	43237414	rs62020698	C	T	0.91	-0.045	NA	4.4E-10	+---
15	44152817	rs9989313	T	C	0.08047	0.0382	0.0063	2.211E-08	++++
15	44420900	rs2555384	T	G	0.05673	0.0589	0.0079	5.383E-12	++++
15	58678512	rs10468017	T	C	0.2757	0.0379	0.0039	7.559E-21	++++
15	58692715	rs12906722	T	C	0.1847	0.0258	0.004	3.079E-11	++++
15	58710627	rs11071380	C	A	0.5778	0.027	0.0037	8.583E-12	++++
15	58730498	rs588136	C	T	0.2058	0.0495	0.0041	3.365E-30	++++
15	63396867	rs2652834	A	G	0.2348	0.0247	0.0042	1.918E-08	++++
15	63795628	rs11638671	T	C	0.6684	-0.0272	0.003	1.04E-19	++++
15	66878900	rs2245586	A	G	0.3175	0.0131	0.0022	4.73E-09	++++
15	73007893	rs730180	A	G	0.7356	0.015	0.0025	2.87E-09	++++
15	101905533	rs11247287	T	C	0.6649	-0.0127	0.0023	2.72E-08	++++
16	15172118	rs11644601	T	C	0.703	0.037	NA	8E-16	++++
16	31088347	rs749671	G	A	0.6055	0.0211	0.0034	6.106E-10	++++
16	53826028	rs28567725	T	C	0.6227	-0.0211	0.0028	2.382E-14	++++
16	56985139	rs9989419	A	G	0.405	0.0243	0.0035	1.052E-11	++++
16	56993211	rs12708967	C	T	0.1966	0.0289	0.0046	1.697E-10	++++
16	56994894	rs4783961	G	A	0.5145	0.0205	0.0035	1.285E-08	++++
16	56995236	rs1800775	C	A	0.5198	0.0396	0.0035	1.332E-26	++++
16	56999258	rs7203984	C	A	0.223	0.0386	0.0045	4.638E-17	++++
16	69862109	rs2937124	T	C	0.3417	-0.0202	0.0031	7.378E-11	++++
16	81533789	rs56823429	C	A	0.283	0.032	NA	1.5E-10	++++
16	85707367	rs871290	C	G	0.323	0.0139	0.0025	2.39E-08	++++
17	7537792	rs727428	T	C	0.4508	0.0187	0.0028	1.237E-11	++++
17	17453067	rs11656215	T	C	0.4756	-0.0201	0.0028	7.566E-13	++++
17	41878166	rs8077889	C	A	0.2441	0.0252	0.0042	9.879E-09	++++
17	58024324	rs1051424	A	G	0.8238	-0.015	0.0025	1.44E-09	+---
17	65989961	rs7502307	C	G	0.7958	-0.0244	0.0034	1.595E-12	++++
17	74268619	rs193220	T	C	0.2956	-0.0189	0.003	3.068E-10	++++
17	76406170	rs4969145	T	C	0.4022	0.023	0.0028	7.41E-17	++++
18	268992	rs9948087	A	C	0.2461	-0.0151	0.0028	4.58E-08	++++
18	19910184	rs9963938	C	G	0.4413	0.0162	0.0028	7.819E-09	++++
18	21161134	rs1788783	T	C	0.504	-0.012	0.0021	9.58E-09	++++
18	60845884	rs12454712	T	C	0.6503	0.0128	0.0023	2.03E-08	++++
19	4965064	rs10853981	A	G	0.3705	0.015	0.0022	1.2E-11	++++
19	7205240	rs10426094	C	T	0.7625	0.0241	0.004	8.468E-09	++++

19	7220013	rs62112763	C	G	0.6009	-0.0221	0.0029	3.274E-14	++++
19	8615589	rs4804311	A	G	0.8905	0.0392	0.006	1.485E-09	++++
19	19103986	rs3810444	T	A	0.94459	0.0636	0.0076	1.571E-16	----
19	19267990	rs7257072	C	T	0.5198	0.0186	0.0033	4.861E-08	++++
19	19407718	rs10401969	T	C	0.92876	0.121	0.0065	9.702E-70	++++
19	19525792	rs2965185	T	C	0.7256	0.0379	0.0037	1.646E-22	++++
19	19738554	rs873870	G	A	0.4802	0.0217	0.0035	1.47E-08	++++
19	19795560	rs7247433	C	A	0.5989	0.0226	0.0037	3.954E-08	++++
19	19819843	rs17699261	A	G	0.94723	0.0775	0.0086	1.447E-16	----
19	19920967	rs4808993	C	A	0.8166	0.0318	0.0053	1.395E-09	++++
19	33933453	rs12460070	A	T	0.6562	-0.0184	0.0029	1.587E-10	++++
19	35559787	rs2018519	T	C	0.8433	-0.0212	0.003	1.57E-12	++++
19	45247627	rs4803750	G	A	0.05541	0.0423	0.007	9.521E-09	++++
19	45370838	rs12610605	G	A	0.8549	0.0277	0.0044	4.42E-09	++++
19	45373276	rs11879589	G	A	0.90501	0.0371	0.0058	3.839E-11	++++
19	45383037	rs11673139	A	T	0.906	0.067	NA	4.4E-18	++++
19	45389174	rs283813	A	T	0.06596	0.0826	0.0083	2.592E-18	++++
19	45395619	rs2075650	G	A	0.1266	0.0436	0.0049	2.308E-21	++++
19	45404691	rs405697	G	A	0.7269	0.0525	0.0048	8.951E-24	++++
19	45412079	rs7412	C	T	0.916	-0.09	NA	5.2E-31	++++
19	45414451	rs439401	C	T	0.6201	0.0659	0.0038	1.423E-66	++++
19	45416741	rs438811	C	T	0.762	-0.091	NA	1.4E-69	++++
19	45432557	rs7259004	C	G	0.09894	0.1	0.0089	8.96E-25	++++
19	45457180	rs3760627	C	T	0.4683	0.0189	0.0034	5.293E-09	++++
19	49259529	rs838133	A	G	0.4204	0.0231	0.0032	8.156E-13	++++
19	50016748	rs59774409	C	T	0.904	-0.043	NA	8.2E-09	++++
20	30211597	rs6088793	T	C	0.7225	0.0162	0.0029	3.22E-08	++++
20	39118662	rs6029143	C	T	0.94195	0.0388	0.0071	4.933E-08	++++
20	44538427	rs378114	C	T	0.7612	0.0286	0.0038	7.499E-13	++++
20	44545048	rs4810479	C	T	0.2876	0.0474	0.0038	2.067E-34	++++
20	44578674	rs16990951	T	A	0.90106	0.0311	0.0052	3.753E-09	++++
20	44598670	rs8123864	C	T	0.3443	0.028	0.0037	1.423E-14	++++
20	44623967	rs1888235	T	C	0.1728	0.0325	0.0047	4.463E-12	++++
20	44640959	rs3918256	G	A	0.4683	0.0218	0.0034	3.262E-10	++++
20	45597546	rs6066141	T	C	0.7586	0.0297	0.0053	2.339E-08	++++
20	51012164	rs1884507	A	C	0.8759	0.0248	0.0038	1.17E-10	++++
21	40465534	rs2836878	A	G	0.256	0.0123	0.0021	7.96E-09	++++
22	38575498	rs133027	CT	C	0.56	0.035	NA	1.8E-16	----
23	37854327	rs3859931	T	C	0.584	-0.022	NA	9.4E-09	----
23	109716407	rs5942937	T	G	0.597	0.039	NA	1.4E-26	----

\* Indicates whether the SNP was present in each genetic study included in this analysis. (+) and (-) indicate the SNP is present or absent, respectively. The order of the studies is UK Biobank, GOCHA, ISGC ICH and GERFHS.