

Investigating genetic causal relationships between blood pressure and anxiety, depressive symptoms, neuroticism and subjective well-being

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ABSTRACT

Background High blood pressure is a leading cardiovascular disease risk factor and considered to be associated with psychological factors. However, the causal relationships between blood pressure and anxiety, depressive symptoms, neuroticism and subjective well-being are not clear.

Aims The current study explored the genetic causal relationships between blood pressure and anxiety, depressive symptoms, neuroticism and subjective well-being.

Methods Mendelian randomisation (MR) analyses were performed using the generalised summary-data-based MR analysis method with eight large-scale genome-wide association study datasets for hypertension, systolic blood pressure (SBP), diastolic blood pressure (DBP), pulse pressure, anxiety, depressive symptoms, neuroticism and subjective well-being.

Results A causal effect of DBP on neuroticism was found, and 1074 independent instrumental single nucleotide polymorphisms were identified by the incorporated Heterogeneity in Dependent Instruments-outlier test among the bidirectional causal relationship between blood pressure and the four psychological states.

Conclusions DBP has a causal effect on neuroticism. Appropriate management of blood pressure may reduce neuroticism, neuroticism-inducing mood disorders and cardiovascular diseases.

INTRODUCTION

According to the concepts of fluid mechanics, flowing blood exerts pressure against the blood vessels, inducing blood pressure (BP). BP is measured in millimetres of mercury (mm Hg) and expressed in terms of systolic BP (SBP, maximum pressure) representing the pressure in blood vessels when the heart contracts, and diastolic BP (DBP, minimum pressure) representing the pressure in the vessels when the heart rests between two continuous contractions. The human body is said to be in a state of hypertension when the SBP is >140 mm Hg and/or the DBP readings are >90 mm Hg on 2 continuous days. Hypertension affects more than a quarter of the

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ As a leading risk factor for cardiovascular disease, increased blood pressure can appear in some psychological states, such as anxiety and neuroticism. Neuroticism is viewed as a key causative factor for anxiety and mood disorders.

WHAT THIS STUDY ADDS

⇒ Diastolic blood pressure has a genetic causal effect on neuroticism.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Appropriate surveillance and control of blood pressure can be beneficial for the reduction of neuroticism, neuroticism-inducing mood disorders and cardiovascular diseases.

global population¹ and is a crucial risk factor in the development of whole-body disorders, particularly heart and circulatory diseases.² Although the aetiology of hypertension is not fully understood, the comorbidity between hypertension and psychosocial and mental disorders has been investigated by several research groups. Nevertheless, the relationship between hypertension and psychosocial disorders remains unclear and is sometimes controversial.³

Anxiety is a feeling of fear, dread and uneasiness, which is a reaction to stress. Depressive symptoms include pessimism, negative affect, low energy, anxiety and bodily pains.⁴ Neuroticism is a personality trait characterised as being prone to experiencing negative emotions such as anxiety, fear, distress, dissatisfaction, depression, anger and guilt. Subjective well-being is measured by survey questions on life satisfaction, positive affect and happiness. A recent controversial systematic review and meta-analysis suggested an association between anxiety and increased risk of hypertension, based on the evidence

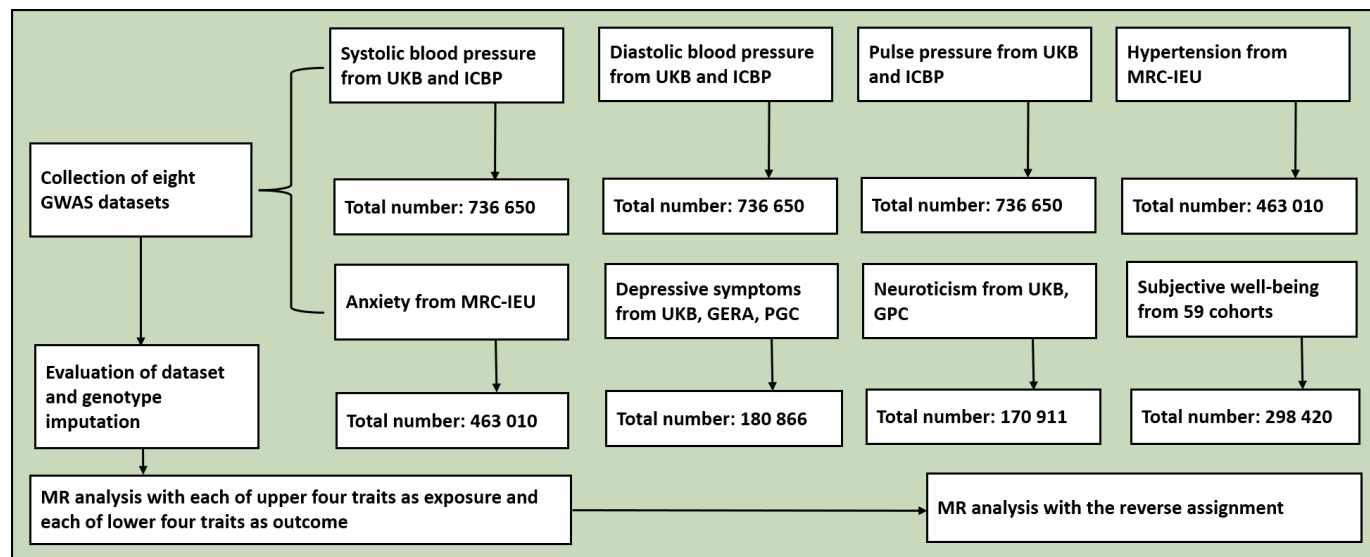


Figure 1 Study flowchart. GERA, Genetic Epidemiology Research on Adult Health and Aging; GPC, Genetics of Personality Consortium; GWAS, genome-wide association study; MR, Mendelian randomisation; PGC, Psychiatric Genetics Consortium; UKB, UK Biobank; ICBP, International Consortium for Blood Pressure; MRC-IEU, Medical Research Council-Integrative Epidemiology Unit.

from cross-sectional and prospective studies.⁵ While there is growing evidence of a relationship between psychosocial states and altered BP, the pathophysiological mechanisms underlying these relationships are unclear or contradictory. The causal effects of BP on anxiety, depressive symptoms, neuroticism and subjective well-being have not yet been elucidated.

Genome-wide association studies (GWASs) are powerful resources for identifying genetic variants contributing to a trait. There are GWASs that consider anxiety, depressive symptoms, neuroticism and subjective well-being, which can provide human genomic information about these psychological states. Mendelian randomisation (MR) analysis is currently a popular method to examine the bidirectional genetic causal effects between two traits based on GWAS summary data.^{6,7} This method can be used to explore the causal effects of BP on psychological states at the genetic level.

Therefore, this study aimed to explore the causal relationships between BP and anxiety, depressive symptoms, neuroticism and subjective well-being based on large samples of GWAS data.

METHODS AND MATERIALS

Study design

Bidirectional two-sample MR analyses were performed to explore the causal association between the exposure (a risk factor) and the outcome (a phenotype). Genetic variants associated with the exposure were selected as instrumental variables. For one direction of the MR analysis, the four BP traits (SBP, DBP, pulse pressure (PP) and hypertension) were treated as the exposure, and the four psychological states (anxiety, depressive symptoms, neuroticism and subjective well-being) were treated as

the outcome. For the other direction of the MR analysis, this assignment was reversed. The study had three phases: (1) collecting summary-level GWAS data for the eight traits, (2) exploring genetic variants to serve as instrumental variables, and (3) estimating the causal effects of the exposure on the outcome.

Data collection and extraction

The flowchart of the current study is described in figure 1. First, the GWAS datasets from European populations for the four psychological states were obtained. The anxiety GWAS dataset was obtained from the MR-base database.⁸ The depressive symptoms GWAS dataset was obtained from the UK Biobank (UKB), Genetic Epidemiology Research on Adult Health and Aging (GERA), and Psychiatric Genetics Consortium (PGC).⁹ The neuroticism GWAS dataset was obtained from the UKB and Genetics of Personality Consortium (GPC).¹⁰ All disorders were assessed using standard diagnostic criteria. The subjective well-being GWAS dataset was obtained from a meta-analysis on summary association statistics from 59 cohorts.⁴ Subjective well-being was classified into four phenotypical panels: primary subjective well-being, life satisfaction, positive affect and post hoc subjective well-being.

GWAS data for DBP and SBP were retrieved from the study by Guo *et al.*¹¹ The GWAS dataset for PP was included as PP has been proposed to describe the difference between SBP and DBP, and is viewed as an independent risk predictor for whole-body disorders (table 1).¹² The hypertension GWAS dataset, with the largest sample size within the MR-base database, also included abnormal BP, defined as SBP >140 mm Hg and/or DBP >90 mm Hg on 2 continuous days.⁸ All participant samples in each

Table 1 Summary of European genome-wide association study data on various blood pressure, anxiety, depressive symptoms, neuroticism and subjective well-being traits

Traits	Sample size	SNPs	Reference (DOI)
Systolic blood pressure	736 650	7 070 522	10.1038/s41467-020-17002-0
Diastolic blood pressure	736 650	7 142 798	10.1038/s41467-020-17002-0
Pulse pressure	736 650	7 071 236	10.1038/s41467-020-17002-0
Hypertension	463 010	9 851 867	https://gwas.mrcieu.ac.uk/datasets/ukb-b-12493/
Anxiety	463 010	9 851 867	https://gwas.mrcieu.ac.uk/datasets/ukb-b-11311/
Depressive symptoms	180 866	6 524 474	10.1038/ng.3552
Neuroticism	170 911	6 524 432	10.1038/ng.3552
Subjective well-being	298 420	2 268 675	10.1038/ng.3552

DOI, Digital Object Identifier; SNPs, single nucleotide polymorphisms.

GWAS were of European ancestry. Ethical approval had been obtained in all original studies.

Detailed descriptions of participant characteristics can be found in each study. All participants were included in only one study. Genotyping was performed on genome DNA extracted from blood samples according to standard procedures from a range of commercially available genotyping arrays, as described in the original reports. Genotype imputation was performed using the 1000 Genomes Project reference panel and IMPUTE2 software.¹³ For each GWAS dataset, all biallelic single nucleotide polymorphisms (SNPs) and SNPs with an imputation score >0.9 were considered for the next analysis, while ambiguous SNPs were excluded. If an SNP was mapped to opposite strands in either dataset, its alleles in the second dataset were flipped.

MR analysis

MR analysis infers the credible causality of a relationship between the exposure and the outcome by leveraging instrumental variables, which are expected to be independent of confounding factors.¹⁴ In MR tests using GWAS data, genetic variants are treated as instrumental variables to test for causality. Due to the possibility of correlated or uncorrelated pleiotropy of genetic variants,¹⁵ exploiting GWAS data with large independent samples can greatly improve the power of an MR analysis. Genetic variants used as instrumental variables need to meet three assumptions; they should: (1) be associated with the exposure, (2) only affect an outcome via the exposure, and (3) be independent of confounders. The MR checklist for Strengthening the Reporting of Observational Study in Epidemiology is provided in the online supplemental materials.¹⁶

The Genome-wide Complex Trait Analysis tool (V.1.93.3 beta2) was used to explore bidirectional causal links between each psychological state and each BP trait in the framework of Generalised Summary-data-based MR (GSMR).¹⁷ This method is based on summary-level data, using independent genome-wide significant SNPs as instrumental variables, that is, an index of the exposure to test for putative causal associations between a risk

factor (exposure) and an outcome. Instrumental variants were selected based on the default GWAS threshold of $p \leq 5 \times 10^{-8}$. An LD (linkage disequilibrium) threshold of $r^2 = 0.05$ was used to identify independent SNPs based on the European population as referenced within the 1000 Genomes Project (phase 3). Heterogeneity in Dependent Instruments (HEIDI)-outlier detection was used to filter genetic instruments that had obvious pleiotropic effects on the exposure and outcome. A threshold p value of 0.01 was used for the HEIDI analysis.¹⁸ We used an F-statistic >10 to define SNPs as valid instrumental variables. Ten was the minimum number of instrumental SNPs required. The power for the MR analysis was calculated using an online calculator (<http://sb452.shinyapps.io/power/>). P values were adjusted using the Bonferroni method, multiplying by 32 for multiple tests.

RESULTS

The GWAS summary datasets obtained are listed in [table 1](#). The maximum sample size of BP traits was 736 650 for SBP, DBP and PP, and the minimum was 463 010 for hypertension. The maximum sample size for psychological states was 463 010 for anxiety, and the minimum was 170 911 for neuroticism. There were no participants who appeared in both the BP and psychological state datasets.

With BP traits as exposure and psychological states as outcome, hypertension and DBP had significant causal effects on neuroticism ($p = 8.8 \times 10^{-6}$ and 0.026, respectively, [table 2](#)). After adjusting for multiple tests, only DBP was significantly associated with neuroticism ($b_{xy} = 0.003 6$, [table 2](#); $p_{\text{bonferroni}} = 0.000 28$). There were 1074 independent instrumental SNPs, which were significantly associated with DBP but not with neuroticism (online supplemental table 1 and [figure 2](#)). These instrumental SNPs, with F-statistic >10, were independent with an LD r^2 less than 0.05 and survived the HEIDI-outlier analysis that removes horizontal pleiotropic SNPs with $p < 0.01$. No significant causal effects were found for other BP traits and each psychological state.

Table 2 Results of Generalised Summary-data-based Mendelian Randomisation analysis

Exposure trait	Outcome trait	bxy	SE	P value	SNPs
DBP	Anxiety	0.012 6	0.006 7	0.061	1087
DBP	Depressive symptoms	0.000 2	0.000 9	0.828	1091
DBP	Neuroticism	0.003 6	0.000 8	<0.001	1074
DBP	SWB	-0.001 2	0.000 8	0.111	941
Hypertension	Anxiety	0.620 9	0.697 7	0.374	84
Hypertension	Depressive symptoms	0.057 1	0.093 0	0.540	84
Hypertension	Neuroticism	0.188 3	0.084 6	0.026	84
Hypertension	SWB	-0.038 8	0.080 1	0.628	68
PP	Anxiety	0.012 7	0.006 4	0.049	842
PP	Depressive symptoms	-0.000 5	0.000 8	0.588	836
PP	Neuroticism	-0.001 2	0.000 8	0.119	822
PP	SWB	0.001 2	0.000 7	0.092	727
SBP	Anxiety	0.004 2	0.004 0	0.287	1024
SBP	Depressive symptoms	-0.000 5	0.000 5	0.302	1024
SBP	Neuroticism	0.000 3	0.000 5	0.585	1006
SBP	SWB	0.000 4	0.000 5	0.355	881

DBP, diastolic blood pressure; PP, pulse pressure; SBP, systolic blood pressure; SNPs, single nucleotide polymorphisms; SWB, subjective well-being.

The reverse causal effects analysis indicated that after clumping and HEIDI-outlier filtering of SNPs, less than the default threshold of 10 independent instrumental variants were retained in the analysis. Since anxiety, depressive symptoms, neuroticism and subjective well-being are complex traits, limited independent instrumental variants may provide biased results. However, without the limit of this threshold, no significant causal association of each psychological state with any BP trait was found. The power of our MR analysis in all pairs of

exposure and outcomes was >90%, given the sample size for the relevant variant-outcome associations, at an alpha of 5%.

DISCUSSION

Main findings

As high BP is a leading risk factor for cardiovascular disease, the relationship between BP and psychological factors is undeniable. However, the causal effects between

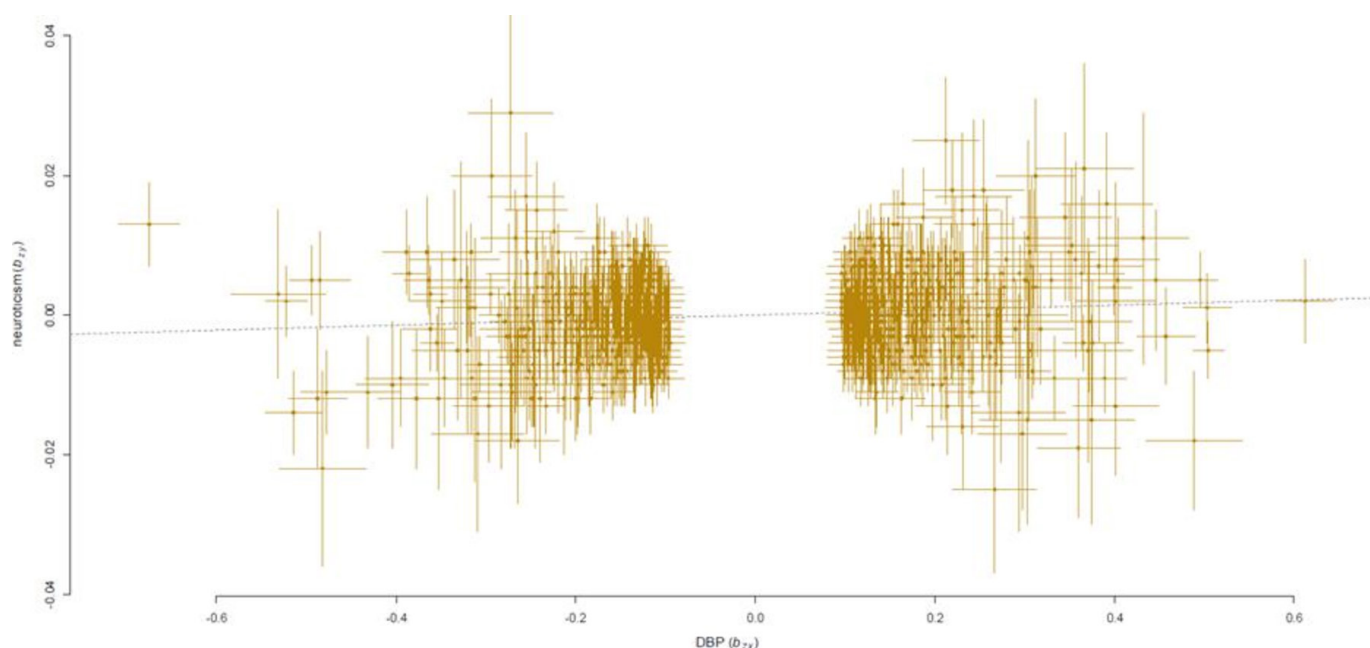


Figure 2 The causal effects of DBP on neuroticism. The dotted lines denote effect sizes (bxy). DBP, diastolic blood pressure.

BP and anxiety, depressive symptoms, neuroticism and subjective well-being are not well distinguished. In this study, we have, for the first time, used GSMR analysis methods and found a causal effect of DBP on neuroticism.

In this study, MR use was based on the assumptions that genetic variants are associated with the exposure factor, are not related to confounding factors associated with the outcome, and must affect the outcome through the exposure factors. MR method is developed to infer the causal relationship between the exposure factors and outcome.¹⁴ Genetic variants from GWASs are usually treated as instrumental variants for their stability and randomness; however, they may cause horizontal pleiotropy where variants affect outcome and exposure traits via a shared heritable factor (correlated pleiotropy) or separate mechanisms (uncorrelated pleiotropy), other than a causal effect.¹⁵ The GSMR method is considered more powerful than other summary data-based MR approaches^{19 20} and incorporates the HEIDI-outlier test to identify loci that influence multiple phenotypes, such as pleiotropy effects on the exposure and outcome.²¹

LIMITATIONS

Current large-scale GSMR analysis reduces the biases caused by confounding factors in observational studies, using random genetic variants as instrumental variables, which may represent lifelong influences and increase the precision of the analysis results. However, there are potential limitations of the current analysis: first, the incorporated HEIDI-outlier test in GSMR can identify loci affecting multiple phenotypes, such as pleiotropy effects on the exposure and outcome²¹; nonetheless, the possibility of residual pleiotropy cannot be completely excluded. More methods are required to evaluate the independence of variants and analysis results. Second, current analyses were predominantly on populations of European ancestry, and therefore, the findings may not be generalisable to other populations. Third, a stringent Bonferroni correction was used to judge the positive MR findings, which may have caused false-negative findings and minimised the ratio of false-positive results.

Implications

BP is an important indicator of blood circulation and is one of the vital signs. BP has 30%–60% heritability, and over 1000 SNPs have been significantly associated with this complex trait by large-scale GWASs.²² Some psychological factors, such as mental stress and anxiety, may cause sudden high BP and increase blood fluidity by activating the sympathetic nervous system.²³ Anxiety, anger and happiness increase BP, and emotional effects have greater variability in individuals with more labile BP.²⁴ In pharmacological studies of hypertension, a reduction of BP in placebo groups is often found, which differs from spontaneous remission and regression to the mean effect of comparing placebo groups with untreated groups.^{25 26} The role of BP in psychosomatic medicine is implied as

BP is a link between the brain and the heart, and thus may promote the development of personality traits. Individuals with neuroticism can be sensitive to the criticism of others, are often self-critical, and easily develop anxiety, anger, worry, hostility, self-consciousness, and depression. Neuroticism is viewed as a key causative factor for anxiety and mood disorders.²⁷ Individuals with neuroticism more frequently experience high mental stress, which can lead to elevated BP and cardiovascular diseases.²⁸ Thus, appropriate management of BP may reduce neuroticism, neuroticism-inducing mood disorders and cardiovascular diseases.

In conclusion, using GWAS datasets with large sample sizes, we found that, among the causal relationship between BP and psychological states, DBP had a causal effect on neuroticism but not on the other psychological states of anxiety, depressive symptoms, or subjective well-being. Since the independent instrumental SNPs for these four psychological states are limited, future studies are required to explore the causal relationship between psychological states and BP.

Contributors LC conceived and wrote the whole manuscript. LC and YL analysed the data. LC and LH proofread the manuscript. LC is the guarantor for the manuscript.

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Competing interests None declared.

Patient consent for publication Not required.

Ethics approval This study involves human participants but the Bioethics Committee of Bio-X Institutes of Shanghai Jiao Tong University exempted this study. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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STROBE-MR checklist of recommended items to address in reports of Mendelian randomization studies^{1 2}

Item No.	Section	Checklist item	Page No.	Relevant text from manuscript
1	TITLE and ABSTRACT	Indicate Mendelian randomization (MR) as the study's design in the title and/or the abstract if that is a main purpose of the study	1	(based on) Mendelian randomization analyses (were performed)
INTRODUCTION				
2	Background	Explain the scientific background and rationale for the reported study. What is the exposure? Is a potential causal relationship between exposure and outcome plausible? Justify why MR is a helpful method to address the study question	4	A systematic review and meta-analysis on controversial results suggests that there is an association between anxiety and increased risk of Hypertension based on the evidence from cross-sectional and prospective studies at that moment
3	Objectives	State specific objectives clearly, including pre-specified causal hypotheses (if any). State that MR is a method that, under specific assumptions, intends to estimate causal effects	4	the aim of this paper was to study causal relationships between blood pressure and anxiety, depressive symptoms, neuroticism and subjective well-being based on GWAS data with the large sample size.
METHODS				
4	Study design and data sources	Present key elements of the study design early in the article. Consider including a table listing sources of data for all phases of the study. For each data source contributing to the analysis, describe the following:		
	a)	Setting: Describe the study design and the underlying population, if possible. Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection, when available.	4	the GWAS datasets on European population for four psychological states, i.e. anxiety, depressive symptoms, neuroticism and subjective well-being were collected respectively
	b)	Participants: Give the eligibility criteria, and the sources and methods of selection of participants. Report the sample size, and whether any power or sample size calculations were carried out prior to the main analysis	5	Detailed description of subjects' characters can be checked in each study.
	c)	Describe measurement, quality control and selection of genetic variants	5	For each GWAS dataset, all bi-allelic SNPs and imputation score (INFO score) above

			0.9 were considered for next analysis, and ambiguous SNPs were excluded.
	d)	For each exposure, outcome, and other relevant variables, describe methods of assessment and diagnostic criteria for diseases	4 All disorders were assessed on the standard diagnostic criteria
	e)	Provide details of ethics committee approval and participant informed consent, if relevant	5 Ethical approval had been obtained in all original studies.
5	Assumptions	Explicitly state the three core IV assumptions for the main analysis (relevance, independence and exclusion restriction) as well assumptions for any additional or sensitivity analysis	5 MR analysis infers the credible causality of a relation between the exposure and the outcome by leveraging instrumental variables, which are expected to be independent of confounding factors, i.e. associated with that exposure but not with confounding factors associated with outcome
6	Statistical methods: main analysis	Describe statistical methods and statistics used	
	a)	Describe how quantitative variables were handled in the analyses (i.e., scale, units, model)	6 explore bidirectional causal links between each psychological state of blood pressure and anxiety, depressive symptoms, neuroticism and subjective well-being and hypertension in frame of Generalized Summary-data-based Mendelian Randomization (GSMR)
	b)	Describe how genetic variants were handled in the analyses and, if applicable, how their weights were selected	6 And $r^2 = 0.05$ as the LD threshold to identify independent SNP based on European population as reference within 1000 genome project (phase3)
	c)	Describe the MR estimator (e.g. two-stage least squares, Wald ratio) and related statistics. Detail the included covariates and, in case of two-sample MR, whether the same covariate set was used for adjustment in the two samples	6 in frame of Generalized Summary-data-based Mendelian Randomization (GSMR) [19]. This method based on summary-level data utilized independent genome-wide significant SNPs as instrumental variables, i.e. an index of the exposure to test for

				<p>putative causal associations between a risk factor (exposure) and an outcome. Instrumental variants were selected based on the default GWAS threshold of $P \leq 5 \times 10^{-8}$. And $r^2 = 0.05$ as the LD threshold to identify independent SNP based on European population as reference within 1000 genome project (phase3). HEIDI outlier detection was used to filter genetic instruments that played obvious pleiotropic effects on the exposure and outcome. A threshold P value of 0.01 was used for the outlier detection analysis in HEIDI</p>
	d)	Explain how missing data were addressed	6	Not applicable
	e)	If applicable, indicate how multiple testing was addressed	6	Furthermore, the P values were adjusted with the Bonferroni method by multiplying 32 for multiple test.
7	Assessment of assumptions	Describe any methods or prior knowledge used to assess the assumptions or justify their validity	6	genetic variants used as instrumental variables need to meet three assumptions: 1) is associated with the exposure, 2) only affect an outcome via the exposure, 3) and is independent of confounders.
8	Sensitivity analyses and additional analyses	Describe any sensitivity analyses or additional analyses performed (e.g. comparison of effect estimates from different approaches, independent replication, bias analytic techniques, validation of instruments, simulations)	6	A threshold P value of 0.01 was used for the outlier detection analysis in HEIDI
9	Software and pre-registration			
	a)	Name statistical software and package(s), including version and settings used	6	genetic variants used as instrumental variables need to meet three assumptions: 1) is associated with the exposure, 2) only affect an outcome via the exposure, 3) and is independent of confounders.

	b) State whether the study protocol and details were pre-registered (as well as when and where)	n.a.	Not applicable
RESULTS			
10	Descriptive data		
	a) Report the numbers of individuals at each stage of included studies and reasons for exclusion. Consider use of a flow diagram	7	The maximum sample size for BP traits for SBP, DBP and PP is 736,650, the minimum one for BP traits is 463,010 for hypertension. The maximum sample size for psychological states is 463,010 for anxiety, the minimum one is 170,911 for neuroticism.
	b) Report summary statistics for phenotypic exposure(s), outcome(s), and other relevant variables (e.g. means, SDs, proportions)	7	The maximum sample size for BP traits for SBP, DBP and PP is 736,650, the minimum one for BP traits is 463,010 for hypertension. The maximum sample size for psychological states is 463,010 for anxiety, the minimum one is 170,911 for neuroticism.
	c) If the data sources include meta-analyses of previous studies, provide the assessments of heterogeneity across these studies	n.a.	
	d) For two-sample MR: i. Provide justification of the similarity of the genetic variant-exposure associations between the exposure and outcome samples ii. Provide information on the number of individuals who overlap between the exposure and outcome studies	7	There were no subjects overlapping between BP studies and psychological state studies.
11	Main results		
	a) Report the associations between genetic variant and exposure, and between genetic variant and outcome, preferably on an interpretable scale	8	1074 independent instrumental SNPs, which are significantly associated with DBP but not with neuroticism
	b) Report MR estimates of the relationship between exposure and outcome, and the measures of uncertainty from the MR analysis, on an interpretable scale, such as odds ratio or relative risk per SD difference	8	With the BP traits as exposure and psychological states as outcome, hypertension and DBP had significant

			causal effects on neuroticism (P= 8.8 E-6 and 0.026, respectively). After adjustment for multiple tests, only DBP is significantly associated with neuroticism (bxy=0.0036, P bonferroni=0.00028, Table 2)
	c)	If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n.a
	d)	Consider plots to visualize results (e.g. forest plot, scatterplot of associations between genetic variants and outcome versus between genetic variants and exposure)	8 Fig 1
12	Assessment of assumptions		
	a)	Report the assessment of the validity of the assumptions	8 These instrumental SNPs with F-statistic >10 are independent with the LD r ² less than 0.05 and are remained through HEIDI-outlier analysis that can remove horizontal pleiotropic SNPs with P value less than 0.01.
	b)	Report any additional statistics (e.g., assessments of heterogeneity across genetic variants, such as I ² , Q statistic or E-value)	n.a
13	Sensitivity analyses and additional analyses		
	a)	Report any sensitivity analyses to assess the robustness of the main results to violations of the assumptions	n.a.
	b)	Report results from other sensitivity analyses or additional analyses	n.a
	c)	Report any assessment of direction of causal relationship (e.g., bidirectional MR)	8 The reverse causal effects analysis indicated that after clumping and HEIDI-outlier filtering SNPs , less than the default threshold of 10 independent instrumental variants were retained for analyzing the causal effects of each psychological state on BP.

		d) When relevant, report and compare with estimates from non-MR analyses	n.a	
		e) Consider additional plots to visualize results (e.g., leave-one-out analyses)	n.a	
DISCUSSION				
14	Key results	Summarize key results with reference to study objectives	9	Here, it is the first time that we utilized GSMR analysis method and found the causal effect of DBP on the neuroticism.
15	Limitations	Discuss limitations of the study, taking into account the validity of the IV assumptions, other sources of potential bias, and imprecision. Discuss both direction and magnitude of any potential bias and any efforts to address them	9	potential limitations of the current analysis are following
16	Interpretation			
		a) Meaning: Give a cautious overall interpretation of results in the context of their limitations and in comparison with other studies	n.a	
		b) Mechanism: Discuss underlying biological mechanisms that could drive a potential causal relationship between the investigated exposure and the outcome, and whether the gene-environment equivalence assumption is reasonable. Use causal language carefully, clarifying that IV estimates may provide causal effects only under certain assumptions	9	These intrigue the interests of the role of blood pressure in psychosomatic medicine since the blood pressure is a link factor between brain and heart and may promote the development of personality trait.
		c) Clinical relevance: Discuss whether the results have clinical or public policy relevance, and to what extent they inform effect sizes of possible interventions	9	Persons with neuroticism more frequently experience higher mental stress which in turn can lead to elevated BP and cardiovascular diseases.
17	Generalizability	Discuss the generalizability of the study results (a) to other populations, (b) across other exposure periods/timings, and (c) across other levels of exposure	n.a	
OTHER INFORMATION				
18	Funding	Describe sources of funding and the role of funders in the present study and, if applicable, sources of funding for the databases and original study or studies on which the present study is based	15	Acknowledgement
19	Data and data sharing	Provide the data used to perform all analyses or report where and how the data can be accessed, and reference these sources in the article. Provide the statistical code needed to reproduce the results in the article, or report whether the code is publicly accessible and if so, where	n.a.	

20	Conflicts of Interest	All authors should declare all potential conflicts of interest	15	Declaration of competing interest
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1. Skrivankova VW, Richmond RC, Woolf BAR, Yarmolinsky J, Davies NM, Swanson SA, et al. Strengthening the Reporting of Observational Studies in Epidemiology using Mendelian Randomization (STROBE-MR) Statement. JAMA. 2021;under review.
2. Skrivankova VW, Richmond RC, Woolf BAR, Davies NM, Swanson SA, VanderWeele TJ, et al. Strengthening the Reporting of Observational Studies in Epidemiology using Mendelian Randomisation (STROBE-MR): Explanation and Elaboration. BMJ. 2021;375:n2233.

Supplementary Table 1. Location information of instrumental SNPs in the current GSMR analysis

Instrumental SNPs	Chromosome	Position	REF Allele	Minor Allele	Minor Allele Global Frequency	P DBP_GWAS	P neuroticism_GWAS
rs34645159	1	1724366	G	A	0.358227	2.07E-14	0.5926
rs3107147	1	2048729	G	G	0.333466	3.26E-09	0.3659
rs2493288	1	3330884	G	A	0.113019	1.97E-23	0.2336
rs4908678	1	7739250	T	C	0.336462	4.59E-10	0.8169
rs2252865	1	8422676	T	T	0.201877	5.51E-11	0.06269
rs17035646	1	1079654 7	G	A	0.388578	1.26E-44	0.9267
rs55857306	1	1189579 5	G	A	0.126398	5.05E-109	0.6445
rs17376426	1	1190816 7	C	T	0.012181	3.42E-10	0.6841
rs12411044	1	1191407 4	G	A	0.124601	5.18E-25	0.03222
rs61736014	1	1193887 2	G	A	0.065895	2.27E-08	0.7795
rs12727430	1	1196180 5	A	T	0.024161	2.01E-23	0.2368
rs2639453	1	1198254 4	T	T	0.179113	6.11E-11	0.735
rs1980607	1	1597523 7	A	G	0.299321	1.51E-10	0.02419
rs848309	1	1630844 7	T	T	0.391773	2.75E-15	0.3134
rs6686889	1	2503047 0	C	T	0.373602	6.95E-22	0.0982
rs4320727	1	2535158 1	G	A	0.470248	1.80E-15	0.9869
rs58693652	1	2542367 6	G	A	0.359425	3.69E-10	0.5217
rs12728150	1	2726873 7	A	G	0.095248	1.28E-10	0.6557
rs17361679	1	2785903 6	T	C	0.055711	1.52E-08	0.8549
rs1565715	1	2953982 3	C	T	0.081869	3.46E-10	0.5999
rs61776678	1	3837702 1	G	A	0.295128	2.69E-08	0.982
rs72663521	1	4000590 3	G	A	0.083467	1.42E-08	0.7613
rs75660984	1	4174012 2	A	G	0.01877	5.41E-09	0.3889

rs2146315	1	4205036 6	C	T	0.309305	5.03E-09	0.3765
rs34538877	1	4238367 0	C	T	0.198083	2.13E-12	0.4954
rs710249	1	4386923 5	G	C	0.242212	6.43E-18	0.02807
rs56810307	1	4497354 6	T	C	0.22484	1.29E-08	0.8141
rs12142296	1	4654167 9	T	G	0.064097	8.89E-11	0.2269
rs12143164	1	4797438 1	C	C	0.31869	4.62E-08	0.9137
rs56120031	1	4804520 2	C	G	0.27496	1.42E-08	0.203
rs4926923	1	4810922 5	T	C	0.14377	4.75E-10	0.7351
rs57490543	1	5201062 3	C	A	0.045927	1.22E-08	0.5662
rs61772592	1	5697968 1	A	G	0.063498	7.42E-09	0.3129
rs12730750	1	5961390 5	G	A	0.19349	1.95E-09	0.2327
rs10493408	1	6699205 4	C	A	0.178514	5.09E-10	0.01168
rs34517439	1	7845051 7	C	A	0.027556	2.02E-19	0.7935
rs658780	1	7855592 8	T	G	0.239018	4.73E-10	0.5627
rs2275902	1	7935736 0	G	C	0.252796	3.62E-08	0.8621
rs786921	1	8928667 3	G	G	0.39996	8.63E-11	0.06083
rs2065152	1	9022851 9	C	T	0.378395	8.95E-10	0.04486
rs17396055	1	9473095 4	G	A	0.19988	4.13E-10	0.03975
rs10776752	1	1.13E+0 8	G	T	0.119209	1.25E-43	0.6499
rs351364	1	1.13E+0 8	A	A	0.288339	1.84E-42	0.3997
rs3737136	1	1.13E+0 8	A	G	0.226438	4.06E-36	0.9248
rs6537762	1	1.13E+0 8	A	A	0.313698	8.38E-18	0.3208

rs11102919	1	1.16E+08	T	C	0.167332	4.20E-15	0.493
rs568032	1	1.16E+08	A	A	0.037939	6.28E-12	0.124
rs1886914	1	1.20E+08	C	C	0.379193	3.04E-10	0.9661
rs72704264	1	1.46E+08	G	C	0.122404	3.60E-08	0.1114
rs139838869	1	1.54E+08	G	A	0.006989	1.62E-08	0.4137
rs11578696	1	1.56E+08	A	G	0.035743	1.65E-08	0.6697
rs2171690	1	1.65E+08	T	C	0.42512	1.19E-11	0.8271
rs7524019	1	1.67E+08	C	T	0.459864	2.60E-09	0.5971
rs10489290	1	1.72E+08	C	A	0.171126	4.07E-11	0.8664
rs12405515	1	1.72E+08	G	G	0.465256	1.92E-22	0.3991
rs3766694	1	1.75E+08	T	C	0.479633	4.07E-10	0.6389
rs3795320	1	1.77E+08	T	G	0.277157	4.44E-09	0.2842
rs150816167	1	1.80E+08	T	C	0.023962	1.17E-10	0.5588
rs11585424	1	1.81E+08	C	T	0.26278	1.52E-10	0.2431
rs41475048	1	1.83E+08	A	G	0.120607	9.93E-10	0.3336
rs4651224	1	1.85E+08	C	C	0.3752	3.39E-10	0.8672
rs882624	1	2.02E+08	C	T	0.136981	3.89E-09	0.2306
rs2644134	1	2.02E+08	A	A	0.160343	2.33E-17	0.5021
rs33996239	1	2.03E+08	C	T	0.107228	2.86E-11	0.251
rs16852778	1	2.04E+08	C	T	0.141174	4.03E-11	0.3655
rs16853084	1	2.04E+08	C	T	0.018371	2.57E-08	0.3106
rs7513240	1	2.04E+08	C	C	0.281949	3.17E-16	0.8964

rs2169137	1	2.04E+0 8	G	G	0.20647	3.11E-09	0.4107
rs2629665	1	2.07E+0 8	C	A	0.387181	1.52E-11	0.2976
rs1502358	1	2.17E+0 8	G	G	0.316494	1.13E-09	0.1838
rs11117882	1	2.18E+0 8	A	G	0.258786	1.34E-20	0.2054
rs35981664	1	2.19E+0 8	A	T	0.235823	2.01E-17	0.2846
rs9431431	1	2.21E+0 8	G	A	0.362819	1.71E-12	0.05967
rs7418070	1	2.27E+0 8	C	C	0.328874	1.30E-13	0.1193
rs2760061	1	2.28E+0 8	T	T	0.346046	1.04E-23	0.8112
rs3736982	1	2.31E+0 8	A	C	0.323283	1.30E-09	0.7647
rs699	1	2.31E+0 8	A	A	0.294928	1.30E-40	0.7884
rs1885018	1	2.36E+0 8	A	C	0.299121	1.76E-08	0.3904
rs72757686	1	2.43E+0 8	G	C	0.007189	3.95E-41	0.1692
rs3943093	1	2.43E+0 8	C	T	0.30631	3.24E-08	0.1508
rs72759896	1	2.44E+0 8	A	G	0.059904	1.06E-08	0.2581
rs4926499	1	2.49E+0 8	G	G	0.100439	9.37E-12	0.8477
rs11252324	10	4124568	G	T	0.057708	3.84E-08	0.02424
rs10906391	10	1352393 7	C	T	0.341254	2.58E-08	0.01515
rs6602177	10	1716714 1	C	C	0.305511	9.52E-16	0.08333
rs2357786	10	1835574 9	T	T	0.452676	4.31E-08	0.5449
rs10740993	10	1844248 2	C	C	0.469649	4.46E-09	0.74
rs16916914	10	1845772 2	T	C	0.021566	6.17E-10	0.6192
rs7087598	10	1846850 5	C	T	0.138179	9.96E-10	0.606

rs61278674	10	1848173 7	A	G	0.111222	2.25E-23	0.5197
rs1779246	10	1850691 1	G	G	0.189696	4.37E-08	0.8916
rs10828399	10	1855396 8	G	G	0.399161	1.92E-62	0.1122
rs10828542	10	1862728 5	A	G	0.463259	2.07E-10	0.869
rs112133583	10	1869568 1	C	T	0.008986	1.20E-15	0.3129
rs7923191	10	1872790 1	A	G	0.253994	1.89E-09	0.4361
rs12258967	10	1872795 9	C	G	0.210663	2.14E-09	0.9546
rs10741083	10	1879085 8	T	C	0.413339	1.65E-12	0.417
rs2808265	10	2793035 9	A	T	0.486422	1.69E-16	0.014
rs3802517	10	2823346 9	T	A	0.388778	5.96E-10	0.07146
rs1265842	10	2892490 1	T	T	0.421925	1.27E-09	0.8394
rs2478835	10	3031794 9	C	T	0.255192	5.21E-09	0.08416
rs2994648	10	3129084 5	C	T	0.078474	6.23E-22	0.11
rs7101163	10	3141009 4	G	T	0.03135	2.17E-32	0.7198
rs76164690	10	3259036 2	T	G	0.1252	2.46E-09	0.5449
rs4948643	10	4537975 9	T	T	0.412141	1.12E-11	0.8791
rs34130368	10	4841179 6	G	T	0.172524	1.48E-10	0.8562
rs4948550	10	6058855 3	T	T	0.392572	1.17E-26	0.4455
rs10761530	10	6239072 6	T	T	0.483027	4.19E-09	0.1392
rs2280449	10	6316995 1	T	A	0.216853	3.97E-11	0.1613
rs7910340	10	6327096 9	C	A	0.168131	7.26E-09	0.9556
rs72831343	10	6351568 1	T	G	0.047324	6.49E-17	0.5031

rs2236295	10	6456489 2	G	T	0.211661	1.80E-08	0.3939
rs10509174	10	6463790 8	G	A	0.110623	7.69E-12	0.434
rs6479908	10	6533364 8	C	G	0.396366	2.22E-09	0.4805
rs28564120	10	7033041 0	A	G	0.207268	4.54E-09	0.1109
rs12247028	10	7541005 2	G	A	0.259385	1.56E-17	0.5132
rs11001051	10	7624354 9	C	C	0.498203	4.66E-10	0.7
rs7098414	10	8221458 6	A	A	0.119209	2.83E-11	0.01152
rs303217	10	9115369 9	T	T	0.292332	1.68E-11	0.1183
rs7070115	10	9590000 4	A	G	0.440895	2.40E-09	0.1969
rs2274224	10	9603959 7	G	C	0.486222	4.22E-12	0.2203
rs555782	10	9614853 6	T	T	0.39976	1.16E-12	0.9716
rs12359148	10	9662231 3	A	G	0.009585	3.16E-11	0.7643
rs1049961	10	9699758 9	A	G	0.272963	2.45E-08	0.2867
rs603424	10	1.02E+0 8	G	A	0.374201	4.62E-10	0.4609
rs2489033	10	1.02E+0 8	A	G	0.035943	4.23E-13	0.9625
rs1006545	10	1.03E+0 8	G	G	0.051717	9.45E-29	0.538
rs17113555	10	1.03E+0 8	C	G	0.179912	7.03E-10	0.8641
rs61447364	10	1.03E+0 8	G	A	0.177716	6.03E-11	0.1813
rs4436485	10	1.03E+0 8	G	C	0.207668	6.63E-15	0.4181
rs4285804	10	1.04E+0 8	T	A	0.461262	1.52E-09	0.7892
rs146504787	10	1.05E+0 8	A	T	0.007788	2.36E-11	0.1412
rs7917547	10	1.05E+0 8	A	C	0.186901	1.70E-09	0.1305

rs12414028	10	1.05E+08	T	A	0.151358	3.16E-08	0.7423
rs12243196	10	1.05E+08	G	A	0.100639	2.55E-08	0.2154
rs4630220	10	1.05E+08	G	A	0.282149	1.89E-10	0.04185
rs7907035	10	1.06E+08	C	C	0.43151	5.59E-14	0.4612
rs61861138	10	1.06E+08	G	A	0.19349	3.66E-31	0.7167
rs911547	10	1.06E+08	G	G	0.223043	4.96E-12	0.8593
rs111777102	10	1.12E+08	C	T	0.054113	1.11E-11	0.4815
rs11196549	10	1.16E+08	G	A	0.065695	6.16E-15	0.569
rs6585256	10	1.16E+08	A	A	0.411142	3.33E-09	0.07313
rs17875473	10	1.16E+08	C	T	0.025759	1.90E-10	0.1317
rs1801253	10	1.16E+08	G	G	0.298323	5.99E-10	0.1591
rs143854972	10	1.16E+08	G	A	0.026757	1.66E-08	0.6224
rs646294	10	1.16E+08	G	T	0.175519	2.75E-08	0.6429
rs72842207	10	1.21E+08	C	T	0.095248	5.77E-50	0.3528
rs1907220	10	1.23E+08	A	A	0.302516	1.02E-08	0.08133
rs10490923	10	1.24E+08	G	A	0.07508	3.88E-14	0.5437
rs9419374	10	1.34E+08	A	A	0.30012	1.45E-11	0.8943
rs7090098	10	1.34E+08	G	G	0.410942	5.96E-09	0.3303
rs80226362	10	1.34E+08	G	T	0.183107	9.27E-28	0.1072
rs11035302	11	1615955	C	C	0.305911	2.76E-15	0.9105
rs56014530	11	1876157	G	A	0.215855	2.09E-13	0.9943
rs569550	11	1887068	T	G	0.423522	2.16E-39	0.02889
rs112492	11	1989274	A	G	0.315096	5.21E-09	0.7533
rs2251375	11	2019496	C	A	0.480631	1.16E-08	0.2929
rs74048200	11	2120298	A	G	0.088658	2.05E-08	0.0558

rs17224476	11	4673788	G	A	0.048323	4.71E-19	0.6784
rs2178152	11	8056799	G	G	0.273562	5.78E-13	0.09622
rs4315061	11	8247020	T	C	0.414137	3.16E-12	0.8919
rs871677	11	8738843	T	C	0.413339	3.20E-12	0.6341
rs77307969	11	9681095	C	T	0.007987	4.69E-09	0.02406
rs415895	11	9769562	C	C	0.479633	4.49E-16	0.8016
rs4243951	11	9856524	A	A	0.447883	4.61E-09	0.3816
rs59717668	11	1032130 9	C	G	0.1248	8.19E-14	0.5235
rs1425152	11	1064916 1	C	A	0.437101	3.00E-20	0.1691
rs2098839	11	1067698 7	T	T	0.161741	3.26E-08	0.4486
rs10832013	11	1329535 3	G	G	0.492212	3.80E-10	0.7852
rs10766139	11	1415406 9	A	T	0.408946	4.71E-14	0.1075
rs10832301	11	1478896 4	G	A	0.350839	4.60E-14	0.1408
rs10832586	11	1630408 9	A	C	0.189896	4.14E-08	0.8744
rs7926335	11	1691786 9	C	T	0.220447	3.60E-09	0.5079
rs7928810	11	1737244 3	C	C	0.270168	1.57E-15	0.566
rs11026586	11	2251553 3	G	A	0.101038	3.12E-09	0.9938
rs10835130	11	2723984 5	C	A	0.054313	2.99E-26	0.6975
rs10835161	11	2733868 9	G	G	0.34345	7.49E-09	0.008848
rs17244049	11	2739806 5	T	C	0.021765	7.89E-10	0.2935
rs56405868	11	2762155 2	G	G	0.307308	2.83E-26	0.2954
rs962369	11	2773442 0	T	C	0.216853	3.74E-08	0.4137
rs2585810	11	2848378 7	G	A	0.428914	3.63E-09	0.5466
rs919045	11	3111181 0	T	C	0.219848	4.50E-08	0.5921
rs61879810	11	3182146 7	A	A	0.154952	4.34E-10	0.3266

rs12225704	11	4626364 0	A	G	0.152157	1.63E-09	0.9301
rs10839204	11	4900224 7	C	T	0.174521	1.05E-14	0.5045
rs12800452	11	5024642 7	A	T	0.084864	1.42E-44	0.2915
rs509564	11	5744811 7	C	T	0.400759	2.50E-08	0.2774
rs7927966	11	5837627 6	C	T	0.215855	3.82E-09	0.8286
rs7125196	11	6127256 5	T	C	0.266573	3.10E-41	0.6932
rs35927325	11	6388249 5	C	T	0.182308	8.60E-16	0.1254
rs2306363	11	6540560 0	G	T	0.15615	5.39E-19	0.852
rs679147	11	6564436 3	A	G	0.416134	7.33E-22	0.7913
rs36027301	11	6780926 8	C	T	0.016973	6.35E-09	0.1608
rs67976715	11	6802374 2	G	C	0.116414	2.94E-21	0.03358
rs78977588	11	6896814 9	C	A	0.080072	5.37E-09	0.9822
rs11605229	11	6907553 8	C	T	0.140974	1.01E-17	0.08976
rs12806952	11	6926386 4	C	T	0.354433	1.18E-10	0.05159
rs586459	11	6946137 4	G	C	0.485024	1.88E-16	0.0136
rs875106	11	7000564 1	G	G	0.497005	1.05E-09	0.7646
rs504217	11	7200608 6	C	T	0.213059	2.84E-08	0.4135
rs11820929	11	7306113 0	C	G	0.288738	3.23E-10	0.005622
rs76704686	11	7437849 9	C	T	0.328474	3.21E-11	0.4331
rs7115331	11	7621859 0	T	G	0.134784	1.45E-08	0.928
rs60143695	11	7763757 0	T	C	0.162141	8.34E-11	0.6215
rs2450128	11	7794007 5	G	A	0.327276	1.36E-09	0.007578

rs2289123	11	8922471 8	G	G	0.458866	2.40E-11	0.2251
rs11021221	11	9530885 4	T	A	0.110024	1.41E-17	0.3366
rs61909958	11	9615167 7	C	G	0.088459	4.66E-08	0.2797
rs1216577	11	1.00E+0 8	A	G	0.117013	3.44E-12	0.0796
rs604723	11	1.01E+0 8	T	T	0.302117	3.09E-26	0.5862
rs73007642	11	1.01E+0 8	C	T	0.01258	4.06E-08	0.6533
rs73007683	11	1.01E+0 8	A	T	0.263379	1.80E-15	0.7776
rs7951348	11	1.07E+0 8	C	T	0.326478	3.52E-22	0.5695
rs58953496	11	1.07E+0 8	T	C	0.160144	7.96E-11	0.4168
rs11608122	11	1.12E+0 8	C	T	0.188099	1.76E-14	0.9053
rs17119370	11	1.16E+0 8	T	A	0.497804	2.58E-15	0.3048
rs7116797	11	1.17E+0 8	A	A	0.358227	1.04E-15	0.5208
rs12790943	11	1.20E+0 8	C	T	0.263778	1.25E-25	0.2076
rs12574332	11	1.23E+0 8	C	T	0.127396	7.61E-17	0.5906
rs4421757	11	1.23E+0 8	A	A	0.380591	6.35E-23	0.8457
rs66518071	11	1.29E+0 8	C	G	0.245008	1.91E-23	0.1714
rs4936099	11	1.30E+0 8	C	C	0.214657	9.90E-10	0.5487
rs11062107	12	2187041	A	G	0.234026	1.98E-57	0.2494
rs55935819	12	2521579	G	A	0.334065	1.97E-10	0.5531
rs75507123	12	5417856	G	T	0.086661	6.83E-09	0.02109
rs11055034	12	1289062 6	C	A	0.239018	1.67E-12	0.7803
rs28444248	12	1525902 0	C	T	0.129992	1.81E-10	0.4176
rs61912333	12	1955481 7	C	G	0.323083	2.28E-22	0.4534

rs2694975	12	1995735 1	A	G	0.261382	3.65E-11	0.6483
rs10743353	12	2019996 2	C	C	0.473642	9.94E-09	0.296
rs11609944	12	2027929 0	G	A	0.278754	1.86E-08	0.3429
rs67382985	12	2033585 3	A	T	0.188498	5.77E-12	0.2021
rs73073676	12	2035127 6	A	T	0.161142	2.25E-08	0.07688
rs6487076	12	2047085 7	A	G	0.195887	3.23E-10	0.8901
rs7306429	12	2416359 1	G	A	0.403954	1.51E-10	0.6446
rs118114077	12	2640781 3	T	A	0.009585	3.07E-12	0.9613
rs10842709	12	2647524 3	T	G	0.261382	9.69E-09	0.7323
rs7969332	12	2739847 8	A	A	0.357827	3.82E-11	0.43
rs7965392	12	4254028 0	G	A	0.359425	1.90E-19	0.0364
rs56304982	12	4815260 5	G	C	0.292931	4.62E-09	0.2112
rs11168245	12	4820449 9	C	G	0.088658	1.89E-15	0.9094
rs61917655	12	4821078 7	C	T	0.060703	1.06E-09	0.5923
rs11168254	12	4821394 2	G	T	0.054513	4.42E-08	0.9573
rs117913411	12	4825435 3	T	A	0.028355	8.56E-11	0.126
rs74484931	12	4961130 4	A	G	0.008786	3.99E-13	0.289
rs7967705	12	5051140 8	T	T	0.200879	3.91E-09	0.1636
rs137920360	12	5060966 1	C	T	0.040735	3.28E-08	0.6241
rs61926181	12	5076703 7	G	A	0.009984	8.21E-11	0.4473
rs3782480	12	5230506 9	G	T	0.129393	2.79E-12	0.4663
rs7304594	12	5344160 7	C	T	0.377396	4.27E-09	0.3227

rs7134440	12	5345009 7	C	T	0.115415	1.52E-147	0.1589
rs6580970	12	5443427 7	C	T	0.295128	7.37E-12	0.6024
rs705696	12	5648064 8	G	A	0.193091	7.00E-09	0.696
rs7137749	12	5709804 0	T	T	0.350839	5.87E-09	0.6593
rs75567496	12	5793412 4	G	A	0.009984	3.47E-08	0.9653
rs10437954	12	5800392 2	G	G	0.199481	2.07E-19	0.6704
rs7959649	12	6778310 8	T	T	0.276158	8.62E-12	0.03742
rs11177683	12	6985591 0	G	A	0.451677	3.72E-88	0.02596
rs521033	12	6995142 8	A	G	0.058107	2.61E-09	0.2998
rs1689468	12	7038025 8	A	G	0.334265	1.84E-12	0.8478
rs1245829	12	7964817 0	A	T	0.238419	2.09E-13	0.2527
rs17353559	12	8961772 0	G	A	0.261581	5.52E-10	0.7008
rs34196696	12	8979770 0	T	C	0.286941	2.70E-20	0.3824
rs2681485	12	9002562 2	G	G	0.409145	1.01E-28	0.8492
rs34217226	12	9003212 8	A	T	0.026757	3.07E-13	0.1148
rs77746315	12	9006009 5	C	T	0.014577	6.19E-23	0.1832
rs2408046	12	9010933 7	T	T	0.272564	2.90E-14	0.8555
rs7963304	12	9043657 1	T	C	0.122604	1.58E-11	0.6822
rs4761524	12	9414417 5	A	A	0.319489	2.64E-09	0.6309
rs11108209	12	9610985 5	T	C	0.027756	1.83E-20	0.6756
rs7134060	12	9671709 5	G	A	0.342452	8.53E-10	0.6897
rs11112529	12	1.06E+0 8	C	T	0.410144	5.63E-14	0.3982

rs11112548	12	1.06E+08	A	T	0.016374	1.61E-15	0.2121
rs61942582	12	1.11E+08	G	A	0.023363	6.34E-12	0.08631
rs850518	12	1.11E+08	A	A	0.282748	1.28E-09	0.553
rs73195866	12	1.11E+08	G	A	0.010184	5.03E-09	0.4584
rs11832104	12	1.12E+08	T	C	0.370807	4.23E-09	0.04283
rs74345431	12	1.12E+08	G	T	0.020967	3.85E-08	0.958
rs17627481	12	1.12E+08	G	A	0.024161	1.64E-10	0.01596
rs7310615	12	1.12E+08	C	C	0.147564	1.58E-20	0.05454
rs112142794	12	1.12E+08	G	A	0.012979	2.29E-32	0.2353
rs59036878	12	1.13E+08	G	A	0.115615	1.04E-10	0.9121
rs4766994	12	1.13E+08	T	C	0.301717	9.27E-09	0.9396
rs7132088	12	1.13E+08	C	T	0.35603	1.11E-12	0.3567
rs2384068	12	1.13E+08	T	T	0.300719	3.84E-08	0.8486
rs2173957	12	1.15E+08	G	G	0.397963	1.42E-14	0.73
rs2217171	12	1.15E+08	T	C	0.346645	4.24E-14	0.07625
rs35493	12	1.16E+08	A	A	0.286542	4.46E-08	0.4176
rs2216475	12	1.16E+08	A	C	0.305312	3.19E-22	0.3126
rs35429	12	1.16E+08	A	G	0.405351	6.49E-09	0.8509
rs2384606	12	1.16E+08	T	C	0.489417	1.65E-13	0.3345
rs10850526	12	1.16E+08	G	A	0.182308	1.23E-08	0.7962
rs11067763	12	1.16E+08	A	G	0.27516	1.47E-67	0.05866
rs3898618	12	1.21E+08	T	C	0.086661	1.49E-08	0.9748

rs3213545	12	1.21E+0 8	G	A	0.313099	5.00E-12	0.7117
rs10744764	12	1.22E+0 8	G	A	0.298123	2.52E-11	0.8166
rs139779037	12	1.23E+0 8	C	T	0.46266	7.56E-09	0.2786
rs138188281	12	1.23E+0 8	G	A	0.013379	1.21E-13	0.7816
rs1727311	12	1.24E+0 8	T	T	0.13139	4.98E-13	0.07255
rs10846495	12	1.24E+0 8	G	T	0.06889	1.49E-10	0.9328
rs1271309	12	1.25E+0 8	A	A	0.152356	3.04E-10	0.941
rs682681	13	2229406 2	T	T	0.208466	2.83E-08	0.9337
rs685926	13	2242716 0	T	C	0.197085	8.25E-10	0.1912
rs55641580	13	2525791 7	C	T	0.126997	7.61E-10	0.8938
rs56211919	13	3007843 1	A	C	0.079273	2.61E-10	0.4232
rs7338758	13	3013782 8	T	C	0.435304	2.18E-08	0.2604
rs9532243	13	3219140 8	A	A	0.317692	6.23E-11	0.01018
rs7321585	13	3826317 6	G	C	0.184904	3.99E-10	0.7906
rs56256111	13	4147896 3	G	A	0.080072	4.10E-12	0.2806
rs4274337	13	4196719 3	A	A	0.308906	4.50E-18	0.38
rs12583637	13	5056449 0	C	G	0.119409	1.05E-09	0.6091
rs3118904	13	5110009 7	G	A	0.24401	9.42E-13	0.7819
rs9526707	13	5148918 6	G	A	0.154353	9.70E-10	0.7527
rs9563529	13	5831663 7	G	T	0.300519	1.62E-22	0.02004
rs3861113	13	7236438 2	C	A	0.363019	1.71E-08	0.7491
rs12866098	13	7311961 7	G	A	0.188898	6.60E-13	0.4806

rs78474310	13	7382690 1	A	G	0.011781	3.13E-09	0.4904
rs1215469	13	8070740 8	A	A	0.194489	3.68E-10	0.8558
rs17268915	13	9798378 9	A	G	0.170527	1.05E-08	0.1895
rs650724	13	1.11E+0 8	G	A	0.126597	8.11E-11	0.6194
rs3783111	13	1.11E+0 8	C	T	0.369209	6.41E-13	0.9718
rs675605	13	1.11E+0 8	G	G	0.289337	2.09E-09	0.3756
rs7338606	13	1.11E+0 8	C	T	0.163538	2.20E-13	0.9938
rs4773140	13	1.11E+0 8	A	A	0.26857	6.63E-09	0.7207
rs12323265	13	1.11E+0 8	A	G	0.437101	3.99E-08	0.7422
rs13379029	13	1.14E+0 8	G	A	0.469449	2.01E-18	0.9869
rs7321688	13	1.15E+0 8	C	A	0.315296	2.28E-20	0.5382
rs7350752	14	2184115 4	G	A	0.044928	1.03E-12	0.02853
rs10467770	14	2189963 1	C	T	0.252796	4.84E-35	0.1098
rs1950500	14	2483085 0	T	T	0.340056	7.48E-14	0.9713
rs2273171	14	3138135 1	T	C	0.388978	9.45E-30	0.9368
rs4424827	14	3511085 7	C	C	0.275759	4.89E-09	0.2287
rs8904	14	3587121 7	G	A	0.447883	1.39E-11	0.5623
rs138679872	14	3612665 1	C	T	0.040735	6.97E-18	0.9186
rs72677847	14	5084425 6	T	C	0.009984	4.12E-11	0.9769
rs3783412	14	5085664 1	A	G	0.496805	5.06E-13	0.06514
rs7161281	14	5335047 9	A	A	0.373203	7.31E-14	0.6572
rs35413927	14	5342035 8	A	G	0.265775	7.22E-09	0.7653

rs117500469	14	5342883 9	G	A	0.009984	6.01E-25	0.5523
rs11628933	14	6070090 3	G	C	0.272564	9.71E-34	0.8007
rs11158678	14	6798754 3	T	C	0.339856	1.46E-08	0.884
rs731681	14	6801022 4	G	C	0.458866	3.36E-43	0.7687
rs57786342	14	6926002 8	G	A	0.190096	5.13E-13	0.3482
rs227426	14	7045666 4	G	T	0.489617	1.76E-25	0.0495
rs2239268	14	7246959 1	G	G	0.411342	1.68E-13	0.3568
rs4903064	14	7327942 0	T	C	0.285343	1.48E-10	0.5695
rs7151887	14	1.00E+0 8	A	A	0.260184	3.66E-08	0.3433
rs8014182	14	1.04E+0 8	C	T	0.091653	4.71E-08	0.06839
rs34896432	14	1.04E+0 8	C	T	0.220447	3.10E-10	0.5521
rs34161718	14	1.05E+0 8	C	T	0.088459	8.70E-10	0.06273
rs10873612	15	2610560 2	C	T	0.403554	4.28E-11	0.9515
rs11070245	15	4031779 2	T	G	0.382588	4.65E-08	0.8627
rs2925345	15	4131179 9	T	C	0.422524	3.03E-08	0.8434
rs4924570	15	4197466 0	T	C	0.263379	5.69E-09	0.1795
rs2927071	15	4391908 1	T	C	0.420927	9.29E-10	0.6786
rs7184016	15	4881049 9	G	T	0.357628	7.31E-15	0.7501
rs11854184	15	4929319 4	C	A	0.076877	1.17E-13	0.6648
rs7169864	15	5390290 1	C	T	0.350839	8.83E-15	0.3357
rs62011935	15	6686195 9	C	T	0.161741	2.10E-14	0.7965
rs893912	15	6692846 9	C	T	0.238618	1.37E-22	0.04403

rs28429256	15	6693161 7	G	A	0.278954	3.39E-20	0.2195
rs2439371	15	6696730 8	A	C	0.3125	7.60E-10	0.6339
rs62004794	15	6845452 3	A	G	0.376198	2.07E-11	0.4633
rs11853359	15	7162152 4	G	A	0.391174	8.53E-29	0.6438
rs351157	15	7455203 1	A	C	0.451877	2.93E-57	0.0464
rs2959010	15	7461309 7	G	A	0.108427	1.05E-11	0.1593
rs28362891	15	7471560 2	G	A	0.035743	7.47E-12	0.9556
rs17861118	15	7502614 9	G	A	0.033746	4.67E-20	0.7787
rs11636952	15	7511432 2	T	C	0.341254	3.24E-14	0.4805
rs62012629	15	7907035 1	C	A	0.334465	9.63E-10	0.4476
rs2627316	15	8104281 6	A	G	0.185503	3.85E-30	0.003986
rs983353	15	8218653 5	A	G	0.284744	7.78E-20	0.5758
rs11259905	15	8394975 1	A	C	0.228634	2.18E-11	0.7357
rs7180952	15	8516255 1	C	C	0.342252	3.49E-14	0.6032
rs8041380	15	8564545 2	C	C	0.051917	1.25E-10	0.3832
rs3743157	15	8568053 2	C	A	0.405751	3.38E-14	0.05022
rs7171498	15	8624424 7	T	C	0.389177	3.82E-23	0.07534
rs78550103	15	9002729 6	G	A	0.125	1.27E-12	0.01084
rs2532102	15	9138088 2	G	G	0.386382	3.42E-24	0.01409
rs56340611	15	9140761 8	T	C	0.01857	3.08E-17	0.5513
rs7497304	15	9142917 6	G	T	0.217452	1.57E-14	0.1216
rs12904445	15	9148001 0	C	A	0.265575	4.77E-40	0.006739

rs873122	15	9270202 0	G	G	0.266773	3.06E-16	0.008794
rs28533980	15	9420787 2	C	T	0.209864	3.30E-09	0.7153
rs12906962	15	9531207 1	T	C	0.421526	3.20E-14	0.3395
rs4984497	15	9663589 9	T	T	0.225639	5.51E-10	0.02533
rs2570816	15	1.00E+0 8	G	G	0.366613	1.44E-09	0.2383
rs9932866	16	706067	G	G	0.306909	2.23E-11	0.2007
rs28590346	16	2080653	A	T	0.407548	1.06E-12	0.06787
rs3211994	16	2089028	C	T	0.1248	3.78E-12	0.7477
rs112372061	16	2101154	G	A	0.042732	5.25E-09	0.8166
rs76073047	16	2222769	G	A	0.017971	2.49E-14	0.1987
rs2240075	16	3535540	G	G	0.436701	2.75E-08	0.8315
rs72760840	16	3951740	T	A	0.250399	7.79E-23	0.2268
rs72762705	16	4020732	C	T	0.184904	4.29E-16	0.3538
rs28562961	16	4064088	G	C	0.187101	2.33E-12	0.1774
rs9922726	16	4257281	A	A	0.453874	8.14E-15	0.05539
rs75345455	16	4419854	C	T	0.023163	3.77E-08	0.2255
rs2404282	16	4753624	G	A	0.394768	1.53E-08	0.05021
rs17137318	16	4895038	G	A	0.052516	1.81E-12	0.9378
rs12446456	16	4922201	C	T	0.459465	4.50E-08	0.1651
rs1126889	16	1206191 0	C	G	0.419728	3.76E-25	0.1804
rs57327054	16	1448703 6	C	T	0.367412	9.07E-12	0.7606
rs77924615	16	2039233 2	G	A	0.156949	3.14E-11	0.0988
rs9937801	16	2108813 0	T	C	0.430711	1.43E-23	0.3526
rs6565174	16	3011190 4	A	A	0.034944	4.77E-09	0.8292
rs80095680	16	3090235 3	A	G	0.286941	2.61E-08	0.03687
rs10468291	16	4976804 6	C	C	0.33127	2.70E-09	0.6141
rs62030049	16	5057270 9	A	G	0.150759	2.70E-10	0.3697
rs1498768	16	5165924 4	G	A	0.025559	1.63E-10	0.2004
rs9932220	16	5175811 6	G	A	0.285144	3.87E-11	0.8093

rs12928581	16	5685238 9	T	C	0.255591	1.46E-08	0.055
rs8062688	16	6693882 3	G	C	0.158347	6.09E-12	0.3194
rs28544928	16	6932926 8	T	G	0.179113	3.90E-09	0.1942
rs4788444	16	7185654 7	A	A	0.046925	1.09E-16	0.5478
rs62055084	16	7309784 5	C	T	0.106629	2.57E-19	0.3935
rs8046697	16	7544214 4	T	C	0.489816	3.19E-12	0.3671
rs12926550	16	8151015 5	G	A	0.28115	3.76E-08	0.4613
rs12929303	16	8160226 4	G	A	0.322484	1.09E-09	0.8587
rs7500448	16	8304579 0	A	G	0.16893	6.73E-12	0.8429
rs35781150	16	8608238 9	A	A	0.458067	2.95E-08	0.07366
rs9939182	16	8656659 6	T	C	0.092452	1.79E-70	0.2755
rs908951	16	8969762 5	C	T	0.392372	4.39E-10	0.5685
rs34019730	16	8981293 0	G	A	0.023163	5.09E-10	0.0805
rs35991606	16	9006707 9	T	C	0.212061	1.65E-09	0.777
rs4362428	17	2090341	C	A	0.2498	1.18E-08	0.2085
rs7215084	17	3880148	C	C	0.467053	1.69E-08	0.8808
rs35552228	17	4626318	T	G	0.08746	3.77E-09	0.05041
rs113086489	17	7171356	C	T	0.451278	1.01E-10	0.6106
rs143001882	17	7182574	C	T	0.016773	4.15E-08	0.1108
rs12600863	17	7355629	A	A	0.43151	1.69E-12	0.006012
rs28625968	17	7474539	C	T	0.247204	2.09E-10	0.02783
rs12949655	17	7575733	A	G	0.179113	7.85E-11	0.07334
rs62059693	17	7723513	T	C	0.054113	8.13E-47	0.516
rs74439044	17	7781019	T	C	0.127796	1.30E-08	0.9626
rs1465249	17	1263929 4	T	T	0.378994	8.70E-13	0.8255
rs9893005	17	1622550 6	C	C	0.495807	4.35E-08	0.2548
rs7221807	17	1822179 9	T	C	0.461062	1.21E-09	0.07445

rs1043809	17	1923943 2	C	T	0.302117	2.76E-10	0.9928
rs76954792	17	3003351 4	C	T	0.134585	1.63E-11	0.2786
rs28661492	17	3060993 2	C	T	0.285144	2.21E-08	0.8432
rs6416904	17	4316375 6	A	A	0.310703	1.49E-19	0.2591
rs4968248	17	4499312 8	G	G	0.489816	3.60E-16	0.1084
rs8070815	17	4594354 6	T	T	0.264976	3.87E-14	0.9811
rs72827873	17	4651578 4	T	C	0.116014	5.06E-24	0.8012
rs45572038	17	4669032 2	C	T	0.030152	5.23E-13	0.7049
rs79917357	17	4682467 4	G	A	0.138179	4.00E-13	0.8853
rs594398	17	4695769 6	G	C	0.41873	5.55E-25	0.7252
rs72835405	17	4720765 8	C	T	0.11881	9.65E-09	0.05889
rs146264265	17	4732196 8	G	A	0.034545	2.49E-12	0.106
rs9889262	17	4739807 0	T	A	0.184904	3.98E-10	0.2734
rs8080108	17	4751371 1	T	C	0.147364	1.46E-08	0.1141
rs2584681	17	4752974 6	A	A	0.351038	6.64E-10	0.005214
rs34430710	17	5687662 7	A	T	0.154153	8.69E-14	0.1841
rs9652858	17	5908780 8	G	A	0.357428	5.94E-10	0.5913
rs1000423	17	5947564 2	C	T	0.456669	5.72E-16	0.8989
rs9635746	17	6114221 1	A	G	0.157348	3.88E-08	0.2902
rs6504163	17	6154577 9	C	C	0.254193	2.14E-10	0.5653
rs1867624	17	6238709 1	C	C	0.297923	6.32E-49	0.2387
rs8068773	17	6262036 6	C	T	0.195887	1.27E-21	0.8196

rs12941755	17	6427552 3	C	G	0.413339	1.77E-11	0.3523
rs3744021	17	7387191 1	G	A	0.419529	7.65E-13	0.7922
rs7406973	17	7529030 1	A	A	0.345647	3.35E-15	0.19
rs1436138	17	7531688 0	A	G	0.440895	2.07E-09	0.6408
rs78554005	17	7644384 3	G	T	0.117212	3.37E-10	0.2221
rs7217916	17	7676943 4	A	A	0.438498	2.65E-12	0.4735
rs112280096	17	7936740 9	C	A	0.172125	9.96E-12	0.7994
rs11077961	17	8101274 9	A	G	0.42512	4.57E-11	0.5757
rs7227492	18	772064	T	C	0.25619	3.97E-13	0.8137
rs334414	18	7124612	C	C	0.236022	2.59E-16	0.9724
rs11665020	18	1087950 3	G	C	0.250599	3.19E-19	0.1699
rs11664781	18	1985054 4	C	T	0.218051	3.79E-15	0.5292
rs11664194	18	2002103 1	T	T	0.460463	9.67E-11	0.3748
rs4800420	18	2015896 5	G	A	0.26278	3.18E-10	0.8856
rs1025655	18	2459621 1	A	A	0.396965	1.04E-08	0.9239
rs10164193	18	3116142 6	T	G	0.116613	1.83E-23	0.1015
rs2615000	18	4229208 4	C	T	0.142572	3.28E-14	0.2675
rs9967367	18	4260609 1	C	T	0.429113	2.63E-15	0.6413
rs72902690	18	4276623 6	A	G	0.095248	1.34E-10	0.8131
rs8089368	18	4815445 4	A	A	0.143371	2.45E-15	0.9553
rs57091267	18	4817077 1	G	A	0.285942	3.75E-12	0.1696
rs11082866	18	4878973 6	A	T	0.206869	4.35E-09	0.5
rs34163044	18	5185161 6	C	A	0.448882	4.72E-09	0.893

rs72930926	18	5261167 2	C	A	0.086861	5.17E-10	0.3956
rs12605156	18	5349811 4	A	T	0.209864	2.83E-11	0.2983
rs10048404	18	5457848 2	C	T	0.251997	2.57E-13	0.1044
rs7235890	18	5573211 5	G	G	0.033546	2.52E-13	0.1011
rs12454712	18	6084588 4	T	C	0.375599	5.31E-77	0.7402
rs4891258	18	7299553 7	A	G	0.240415	7.34E-29	0.2595
rs12609484	19	4970593	G	T	0.304313	3.92E-17	0.3026
rs10424224	19	7240481	C	T	0.385583	2.21E-09	0.2004
rs12978472	19	7257990	C	G	0.068091	2.11E-43	0.3861
rs11671314	19	7258405	G	C	0.192891	3.82E-18	0.5801
rs2860184	19	7287748	C	G	0.225639	1.94E-09	0.2158
rs12462548	19	7295991	A	A	0.464457	8.51E-11	0.2192
rs35086839	19	7491215	A	C	0.192093	1.31E-08	0.1598
rs2009733	19	8398714	A	G	0.472644	1.37E-08	0.5765
rs10409243	19	1033298 8	C	T	0.420327	5.86E-14	0.5186
rs113783450	19	1127171 4	G	A	0.270966	1.77E-10	0.2275
rs968699	19	1128982 6	C	C	0.320887	6.31E-09	0.01237
rs116917543	19	1149613 0	A	C	0.055911	1.01E-08	0.7746
rs318699	19	1150124 0	A	A	0.2502	2.11E-23	0.668
rs2291516	19	1150817 7	G	A	0.210463	3.99E-08	0.9632
rs167479	19	1152676 5	G	T	0.445687	5.06E-23	0.5621
rs78162058	19	1158935 8	A	G	0.069888	5.82E-12	0.5256
rs66502847	19	1261564 6	A	G	0.265575	1.77E-13	0.4121
rs189556314	19	1310679 1	C	T	0.013379	8.36E-09	0.53
rs3745318	19	1643626 2	T	T	0.220647	1.78E-10	0.9117
rs10401771	19	1720991 4	G	A	0.487021	2.65E-08	0.8915

rs1077795	19	1722258 4	A	G	0.16234	4.61E-09	0.8094
rs72999033	19	1936663 2	C	T	0.026158	8.48E-12	0.1488
rs6511291	19	2195040 2	T	T	0.478035	2.29E-09	0.636
rs3786516	19	3010031 9	T	T	0.221645	1.28E-09	0.2106
rs7257694	19	3031466 6	C	T	0.192891	5.84E-11	0.03797
rs11084240	19	3034706 9	T	C	0.200879	1.82E-08	0.7966
rs8108717	19	3191191 4	A	A	0.350639	7.23E-09	0.7608
rs10421783	19	3245784 6	A	A	0.289337	4.23E-08	0.4699
rs1821295	19	3259077 3	C	C	0.156949	1.32E-10	0.3061
rs12983238	19	3943853 2	A	A	0.289137	5.81E-14	0.06412
rs55710016	19	4082873 0	G	A	0.423522	3.68E-09	0.9313
rs12983471	19	4104200 3	A	G	0.324081	1.11E-10	0.5677
rs11083560	19	4110040 6	C	G	0.259784	1.33E-18	0.08818
rs56254331	19	4182602 0	A	C	0.070288	1.51E-09	0.5239
rs73036520	19	4574948 4	G	C	0.130391	4.22E-09	0.3914
rs55706574	19	4755618 0	G	A	0.389377	8.43E-14	0.1844
rs679574	19	4920610 8	C	G	0.320687	2.28E-13	0.1779
rs73046792	19	4960570 5	G	A	0.054912	9.03E-24	0.8257
rs77350929	2	9805281	T	G	0.124002	1.32E-08	0.3868
rs1373780	2	1950102 9	G	C	0.272963	1.33E-08	0.9856
rs824522	2	1970772 6	G	A	0.11901	1.13E-12	0.2369
rs824487	2	1975103 1	G	G	0.197883	1.76E-08	0.9651

rs12471360	2	2000090 9	G	G	0.466054	3.41E-14	0.1372
rs342130	2	2071565 6	A	A	0.440695	3.60E-09	0.8398
rs11890632	2	2491815 9	T	T	0.239816	1.44E-08	0.8129
rs2384061	2	2513562 0	G	A	0.442292	7.25E-09	0.9184
rs1554903	2	2680960 6	G	C	0.090655	2.07E-14	0.1446
rs1275988	2	2691436 4	C	T	0.408946	1.43E-14	0.2714
rs6547850	2	2862934 3	G	T	0.446486	2.31E-08	0.05224
rs57361399	2	3752831 1	C	T	0.420527	4.73E-09	0.8535
rs7600995	2	3757502 6	C	C	0.297923	2.75E-20	0.8571
rs3731851	2	3788091 9	A	T	0.473642	4.40E-10	0.4152
rs35970998	2	4055892 3	A	G	0.266973	1.70E-09	0.4791
rs12611608	2	4057716 2	G	G	0.319289	2.18E-09	0.8837
rs11681462	2	4235256 7	A	C	0.111022	4.76E-09	0.2969
rs6732574	2	4305255 7	C	T	0.211462	2.71E-10	0.7251
rs10195828	2	4315217 9	C	G	0.184105	4.17E-09	0.7674
rs1867852	2	4315779 7	T	T	0.291134	6.10E-11	0.3446
rs76326501	2	4316787 8	A	C	0.03115	2.14E-08	0.4593
rs2374479	2	4320344 3	A	A	0.220447	9.37E-23	0.3926
rs10201456	2	4327782 3	G	G	0.310104	1.31E-09	0.319
rs4952660	2	4333214 3	A	C	0.492013	2.41E-08	0.2964
rs10167379	2	4339716 0	G	G	0.427316	6.73E-09	0.1805
rs34846921	2	4344672 3	C	T	0.123203	1.63E-12	0.02856

rs6708660	2	4375238 2	T	C	0.364217	4.17E-15	0.3066
rs35827613	2	4421547 4	T	G	0.444489	1.31E-14	0.9863
rs687914	2	4587876 0	G	T	0.108227	2.86E-08	0.5257
rs7602129	2	4623535 9	C	C	0.233027	3.94E-14	0.1571
rs10495928	2	4635316 6	A	G	0.321286	4.43E-08	0.2967
rs11690961	2	4636333 6	A	C	0.040535	6.49E-10	0.1804
rs1454393	2	5300222 5	C	A	0.462061	2.74E-15	0.5243
rs2586970	2	5582996 7	A	G	0.358427	2.61E-08	0.4095
rs72816333	2	6009656 0	A	T	0.172524	2.27E-37	0.9184
rs7608483	2	6183623 5	A	A	0.364018	1.72E-34	0.1521
rs13014371	2	6421778 6	T	C	0.237021	4.10E-17	0.8883
rs929698	2	6500875 6	A	A	0.441494	1.03E-12	0.4559
rs12052761	2	6906584 1	G	A	0.403954	7.57E-12	0.03242
rs1876489	2	7305227 3	G	G	0.40655	6.52E-09	0.6604
rs6546810	2	7338971 6	T	C	0.499401	3.58E-10	0.4737
rs2421664	2	7385888 1	C	C	0.499401	3.83E-36	0.07968
rs111384899	2	8562018 8	T	C	0.135982	8.04E-15	0.06174
rs311564	2	8629349 8	G	A	0.356829	2.49E-09	0.05142
rs1813381	2	9642293 9	T	C	0.178315	1.19E-12	0.5275
rs4907238	2	9719719 5	A	G	0.400359	2.67E-12	0.6779
rs28377357	2	1.13E+0 8	G	A	0.288938	5.09E-10	0.2873
rs62158170	2	1.14E+0 8	A	G	0.16893	2.34E-08	0.4291

rs10864859	2	1.21E+0 8	G	G	0.223243	2.88E-09	0.7726
rs7606205	2	1.44E+0 8	A	C	0.397564	9.90E-23	0.1635
rs55990632	2	1.45E+0 8	A	G	0.010383	3.27E-75	0.2824
rs11682590	2	1.46E+0 8	G	C	0.030551	1.17E-12	0.31
rs72854462	2	1.46E+0 8	A	G	0.159145	2.62E-09	0.9336
rs62167177	2	1.46E+0 8	A	T	0.06909	9.29E-14	0.4227
rs114654100	2	1.46E+0 8	G	A	0.029553	1.70E-10	0.5265
rs4662247	2	1.46E+0 8	A	A	0.381589	5.04E-10	0.1766
rs62169544	2	1.47E+0 8	G	A	0.341254	3.33E-09	0.6921
rs12990959	2	1.49E+0 8	T	C	0.345847	1.95E-08	0.3433
rs1220128	2	1.58E+0 8	G	G	0.245208	7.19E-10	0.008439
rs72936986	2	1.59E+0 8	A	C	0.125399	2.26E-16	0.8546
rs16848690	2	1.64E+0 8	C	T	0.210463	8.77E-13	0.9651
rs12989633	2	1.65E+0 8	T	C	0.025359	1.00E-08	0.2112
rs16849203	2	1.65E+0 8	T	C	0.007388	1.14E-11	0.915
rs73029563	2	1.65E+0 8	C	G	0.358826	8.78E-16	0.9895
rs78697967	2	1.65E+0 8	G	C	0.011182	1.37E-08	0.0197
rs146069750	2	1.65E+0 8	G	A	0.029752	4.77E-88	0.3577
rs10195252	2	1.66E+0 8	T	C	0.396965	1.42E-31	0.9356
rs6758859	2	1.74E+0 8	T	C	0.377396	3.29E-08	0.3799
rs12623637	2	1.78E+0 8	A	A	0.40615	6.99E-19	0.8679
rs6715901	2	1.80E+0 8	G	A	0.276358	1.22E-08	0.261

rs17362588	2	1.80E+08	G	A	0.035743	1.18E-13	0.9772
rs10184839	2	1.82E+08	A	A	0.167133	3.25E-08	0.526
rs13420407	2	1.83E+08	A	G	0.264577	1.03E-08	0.7955
rs12693302	2	1.83E+08	G	A	0.461661	4.06E-08	0.7065
rs76820456	2	1.83E+08	T	C	0.006589	5.77E-26	0.6519
rs7576060	2	1.88E+08	C	T	0.317891	1.24E-57	0.7598
rs7592578	2	1.91E+08	T	T	0.175319	5.61E-12	0.587
rs10198390	2	1.92E+08	G	T	0.326877	9.54E-12	0.2305
rs4675297	2	2.04E+08	A	G	0.363419	3.13E-08	0.8717
rs2162003	2	2.05E+08	T	C	0.354433	1.68E-09	0.7985
rs1263671	2	2.08E+08	T	C	0.194888	1.24E-14	0.1051
rs4675682	2	2.08E+08	T	C	0.394169	7.96E-40	0.3857
rs6713398	2	2.09E+08	C	A	0.374401	3.00E-12	0.5981
rs1047891	2	2.12E+08	C	A	0.288538	9.07E-10	0.7163
rs1035673	2	2.19E+08	T	T	0.387979	1.03E-08	0.9937
rs1863798	2	2.19E+08	A	A	0.498203	2.66E-20	0.2037
rs1996992	2	2.20E+08	G	T	0.077875	2.88E-09	0.7545
rs12474050	2	2.20E+08	C	T	0.417133	1.60E-60	0.01503
rs10804330	2	2.27E+08	T	C	0.300719	2.71E-11	0.4102
rs1044822	2	2.31E+08	C	T	0.1248	2.75E-11	0.1643
rs4507125	2	2.40E+08	A	C	0.222644	2.11E-16	0.4804
rs67535236	20	4097355	A	G	0.090855	1.45E-09	0.964
rs297690	20	4426656	T	T	0.293331	1.32E-13	0.4383

rs6054139	20	6327810	G	G	0.355232	9.48E-16	0.1397
rs6039211	20	8616588	A	G	0.440296	1.56E-09	0.09182
rs6077799	20	1042617 4	A	G	0.351238	2.94E-23	0.5782
rs693974	20	1055725 2	C	C	0.442692	1.15E-14	0.9226
rs73075346	20	1062722 8	C	G	0.119808	8.64E-15	0.6974
rs78837242	20	1072411 0	C	T	0.028155	1.57E-58	0.6894
rs78845099	20	1074361 2	A	T	0.11901	2.51E-10	0.8749
rs77463299	20	1081069 8	G	T	0.023762	1.81E-18	0.6487
rs6040225	20	1087496 6	C	C	0.416733	1.10E-23	0.7427
rs6040260	20	1095469 1	G	C	0.391374	1.29E-10	0.3381
rs1327235	20	1096903 0	A	G	0.464457	5.02E-09	0.6616
rs6108801	20	1098951 9	C	T	0.070687	4.45E-08	0.8662
rs6040421	20	1117046 9	A	G	0.434105	8.74E-10	0.5321
rs1232482	20	1188664 3	C	T	0.315695	3.44E-10	0.3254
rs13044147	20	1760511 1	T	G	0.0627	1.17E-13	0.4369
rs6081555	20	1924572 3	G	T	0.284744	1.64E-31	0.2648
rs6046137	20	1946683 2	A	G	0.301917	1.23E-49	0.3611
rs6137201	20	2095766 9	A	T	0.258986	5.16E-11	0.06863
rs6060262	20	3019307 1	A	C	0.286542	2.97E-14	0.3187
rs13042148	20	3229828 6	C	T	0.062101	1.47E-09	0.1828
rs4810332	20	4026833 4	T	A	0.484026	7.37E-09	0.5272
rs58442973	20	4277097 2	G	A	0.175919	1.89E-10	0.2736
rs6031431	20	4279515 2	A	G	0.431709	2.24E-12	0.3187

rs4315587	20	4721464 4	A	A	0.290335	2.23E-10	0.8877
rs79044887	20	4742783 1	C	G	0.084465	2.40E-11	0.1538
rs237485	20	4800423 8	A	G	0.28754	1.59E-33	0.2987
rs6021247	20	5010898 0	G	G	0.319888	2.42E-21	0.07362
rs2801008	20	5178871 8	T	G	0.375599	1.27E-14	0.2611
rs117455294	20	5742795 1	C	A	0.010982	2.92E-10	0.6391
rs75803555	20	5745781 9	C	T	0.057907	1.31E-21	0.9576
rs234623	20	5748896 4	G	G	0.40615	4.51E-16	0.19
rs151356	20	5760794 9	G	A	0.139577	8.81E-11	0.5588
rs1535271	20	5773475 3	G	A	0.283147	3.15E-13	0.4758
rs6026739	20	5773946 9	A	T	0.135184	2.53E-46	0.04988
rs6062295	20	6229117 4	A	G	0.437899	2.05E-20	0.9635
rs6742	20	6237444 1	T	T	0.211462	1.37E-14	0.556
rs6062530	20	6241838 5	T	G	0.213259	2.68E-17	0.8126
rs4809361	20	6244766 2	T	T	0.201478	3.18E-09	0.4823
rs6011210	20	6252992 3	A	A	0.288538	1.01E-14	0.1961
rs73153123	20	6264199 4	G	A	0.06909	2.30E-08	0.8594
rs2275292	20	6266105 2	T	C	0.195887	9.61E-09	0.9118
rs35213536	20	6269431 9	G	T	0.195687	6.02E-19	0.01232
rs1882961	21	1655636 7	C	T	0.226837	3.41E-11	0.1085
rs71326977	21	3529097 5	C	A	0.188898	2.75E-11	0.4394
rs8128234	21	3647086 5	C	T	0.226438	1.35E-11	0.001603

rs2836411	21	3981983 0	C	T	0.326877	1.77E-12	0.009845
rs2836489	21	3991068 0	C	T	0.494409	2.02E-19	0.7372
rs762384	21	4007439 6	C	C	0.179113	1.91E-08	0.7454
rs1571737	21	4353067 1	T	C	0.185104	1.40E-12	0.1564
rs8133022	21	4471870 8	A	A	0.148363	2.85E-14	0.2028
rs79094191	21	4472089 0	T	C	0.032548	1.49E-46	0.09328
rs12627514	21	4475944 0	C	G	0.241214	1.01E-09	0.2495
rs7280794	21	4477690 5	A	A	0.265575	1.63E-34	0.1718
rs4818833	21	4498954 7	A	A	0.202276	1.27E-08	0.5491
rs378459	22	1828529 9	T	C	0.267372	3.92E-10	0.1887
rs5992929	22	1845197 7	C	T	0.21246	9.78E-11	0.3801
rs134041	22	2805633 8	T	T	0.391973	1.37E-08	0.1655
rs6005856	22	2914228 6	G	A	0.097444	2.40E-18	0.1895
rs12321	22	2945319 3	G	C	0.40595	1.07E-09	0.03387
rs4347951	22	2951332 6	T	C	0.279952	5.68E-09	0.1529
rs12484046	22	3143965 0	G	A	0.24361	1.71E-14	0.2025
rs17683807	22	3250800 4	T	C	0.17492	2.51E-16	0.5192
rs2012831	22	3683726 0	G	A	0.432109	4.93E-09	0.0213
rs347585	3	1128622 0	C	C	0.384984	2.17E-08	0.2709
rs2616551	3	1166712 3	A	G	0.304113	3.92E-11	0.1942
rs1687295	3	1488975 6	T	T	0.185304	6.64E-10	0.1517
rs6442608	3	1658827 3	T	C	0.431709	3.53E-10	0.0859

rs4634143	3	2316374 9	T	T	0.203674	2.91E-08	0.9729
rs2643826	3	2756298 8	C	C	0.461062	6.93E-16	0.5042
rs9882581	3	2769900 1	T	C	0.343051	2.21E-08	0.2607
rs72851229	3	2937421 9	G	C	0.201478	2.92E-10	0.0698
rs56401299	3	3042256 3	C	T	0.260783	2.32E-87	0.09629
rs7427249	3	3757248 9	G	G	0.409345	5.65E-09	0.8854
rs4974072	3	4122258 6	G	A	0.328674	3.44E-16	0.4753
rs144282473	3	4146733 3	C	T	0.008586	6.97E-09	0.2472
rs114714860	3	4188290 5	G	C	0.318091	1.00E-18	0.9212
rs113134141	3	4686193 9	A	G	0.204473	2.97E-10	0.205
rs62260779	3	4800946 7	C	T	0.027356	1.11E-10	0.4597
rs6442105	3	4818232 6	A	A	0.276558	5.19E-11	0.5987
rs36022378	3	4991370 5	T	C	0.105232	1.14E-08	0.06465
rs3821843	3	5355801 2	G	G	0.327077	6.14E-15	0.06201
rs2680663	3	5373529 9	A	G	0.373003	1.63E-08	0.9135
rs62250937	3	5387031 8	T	C	0.096845	6.08E-09	0.9408
rs3772219	3	5677125 1	A	C	0.414736	1.16E-22	0.5596
rs11130567	3	5707411 9	C	C	0.289337	8.14E-09	0.6628
rs12486605	3	5770650 3	T	T	0.446286	1.96E-12	0.0862
rs3774702	3	6385687 0	G	A	0.228235	3.94E-08	0.3493
rs9870517	3	6470860 0	A	A	0.351837	5.90E-12	0.3513
rs4499560	3	7092048 5	A	A	0.453075	1.02E-10	0.4076

rs7623706	3	7471275 4	A	G	0.198882	1.13E-11	0.1708
rs62263915	3	8566309 7	C	C	0.467452	9.57E-10	0.6342
rs6809755	3	1.01E+0 8	A	T	0.444888	1.89E-60	0.8504
rs28675079	3	1.12E+0 8	G	A	0.253594	3.37E-14	0.4616
rs1282980	3	1.12E+0 8	T	C	0.190296	3.70E-08	0.702
rs9834975	3	1.22E+0 8	A	T	0.425519	2.92E-42	0.3771
rs34605102	3	1.24E+0 8	G	A	0.385583	8.69E-17	0.6039
rs4141663	3	1.25E+0 8	C	T	0.492212	4.57E-08	0.1897
rs62264113	3	1.27E+0 8	G	A	0.152556	1.05E-08	0.03923
rs4077158	3	1.34E+0 8	T	C	0.381989	2.25E-16	0.3418
rs71331756	3	1.34E+0 8	C	T	0.024361	2.00E-08	0.3301
rs12495847	3	1.34E+0 8	A	A	0.420128	4.16E-10	0.9391
rs6807945	3	1.38E+0 8	C	C	0.134185	9.65E-09	0.2277
rs74734425	3	1.41E+0 8	C	T	0.020567	1.09E-17	0.5056
rs9844972	3	1.50E+0 8	G	C	0.020367	3.72E-14	0.5739
rs73158427	3	1.54E+0 8	T	A	0.133786	4.07E-08	0.9908
rs78809139	3	1.55E+0 8	G	A	0.052915	1.53E-16	0.4812
rs78151625	3	1.58E+0 8	T	C	0.140775	1.93E-08	0.5403
rs9683091	3	1.69E+0 8	A	C	0.41853	1.54E-51	0.8979
rs2242338	3	1.69E+0 8	A	C	0.136182	1.93E-08	0.4036
rs62294304	3	1.69E+0 8	T	A	0.019768	2.76E-23	0.1025
rs7626980	3	1.69E+0 8	G	G	0.366813	3.35E-08	0.5017

rs2421651	3	1.69E+08	A	G	0.472644	7.04E-18	0.1685
rs4955571	3	1.69E+08	G	G	0.261182	1.75E-12	0.3178
rs6444866	3	1.69E+08	G	A	0.07488	4.03E-18	0.834
rs4894808	3	1.72E+08	G	C	0.388778	1.21E-08	0.6379
rs7611674	3	1.79E+08	T	G	0.291534	7.23E-15	0.0982
rs12630496	3	1.83E+08	T	C	0.426318	9.84E-13	0.3528
rs6779368	3	1.85E+08	A	G	0.425919	2.14E-11	0.1459
rs73175562	3	1.85E+08	A	G	0.030951	8.14E-09	0.8414
rs147501096	3	1.86E+08	G	C	0.018171	6.47E-10	0.5608
rs6776964	3	1.89E+08	G	A	0.48722	1.10E-12	0.9079
rs1706003	3	1.94E+08	G	T	0.203275	1.05E-11	0.1211
rs9823829	3	1.95E+08	G	A	0.286741	1.40E-09	0.1835
rs4244200	3	1.96E+08	G	C	0.323083	7.23E-10	0.2955
rs6777317	3	1.97E+08	G	G	0.388978	1.86E-10	0.8783
rs61789369	4	2265295	A	G	0.034145	1.31E-62	0.4037
rs12513171	4	17997541	T	C	0.267173	7.76E-11	0.7668
rs16896276	4	18015156	T	A	0.23123	6.33E-11	0.0553
rs28667801	4	26785356	A	T	0.400759	6.20E-35	0.4764
rs1878825	4	36091370	C	G	0.326078	5.03E-15	0.4924
rs11721984	4	38343935	C	T	0.207668	2.77E-08	0.6562
rs62301873	4	40603821	A	G	0.111422	2.40E-10	0.8325
rs4998802	4	48800910	G	A	0.178514	1.13E-09	0.986

rs871606	4	5479924 5	T	C	0.207867	1.17E-08	0.8399
rs11945489	4	5646377 5	C	T	0.333067	5.80E-10	0.7982
rs6551716	4	6357569 6	T	T	0.157947	6.66E-12	0.5953
rs34587285	4	7334949 1	C	T	0.36881	5.11E-20	0.0764
rs6838416	4	7737882 9	G	G	0.360024	2.12E-17	0.5273
rs72656514	4	8110464 3	G	A	0.228634	2.54E-13	0.9414
rs11934116	4	8115010 9	C	T	0.310104	5.84E-25	0.1586
rs13125101	4	8117459 2	G	A	0.232428	1.67E-19	0.2981
rs72976750	4	8672568 4	T	C	0.160543	6.57E-180	0.161
rs2085600	4	8977990 9	G	A	0.283147	1.24E-08	0.4875
rs1807870	4	8994767 1	A	A	0.471845	2.01E-08	0.5614
rs7694000	4	9532496 8	A	A	0.46226	2.08E-11	0.9222
rs1527351	4	1.02E+0 8	T	C	0.442093	2.27E-22	0.7363
rs17249006	4	1.02E+0 8	C	T	0.086661	1.07E-18	0.1268
rs34814827	4	1.03E+0 8	C	T	0.290535	2.09E-09	0.9187
rs151378	4	1.03E+0 8	G	A	0.332468	1.35E-23	0.6646
rs13107325	4	1.03E+0 8	C	T	0.023562	1.61E-26	0.3558
rs62327956	4	1.03E+0 8	A	T	0.283147	4.43E-14	0.9212
rs7695249	4	1.03E+0 8	C	T	0.261382	1.06E-15	0.1974
rs223361	4	1.04E+0 8	T	C	0.391773	7.35E-10	0.2998
rs13112725	4	1.07E+0 8	G	G	0.342452	2.21E-50	0.4067
rs7694643	4	1.09E+0 8	G	G	0.461062	4.13E-12	0.8503

rs2348212	4	1.11E+0 8	G	A	0.259185	1.06E-08	0.01923
rs1879056	4	1.11E+0 8	C	C	0.419728	2.49E-12	0.4
rs6813719	4	1.11E+0 8	A	A	0.372604	4.60E-08	0.4381
rs4834735	4	1.20E+0 8	T	T	0.162141	1.04E-08	0.5818
rs66887589	4	1.21E+0 8	T	C	0.497204	6.35E-18	0.4459
rs10002908	4	1.38E+0 8	A	T	0.292732	1.35E-08	0.003693
rs4864422	4	1.38E+0 8	A	G	0.485623	3.96E-20	0.4909
rs9286351	4	1.38E+0 8	A	A	0.446885	1.45E-16	0.01324
rs72719149	4	1.44E+0 8	T	C	0.26238	4.47E-15	0.4027
rs4292285	4	1.45E+0 8	T	A	0.41234	1.14E-09	0.8925
rs10007819	4	1.49E+0 8	T	T	0.430711	4.79E-11	0.2328
rs4240358	4	1.51E+0 8	A	A	0.183107	4.89E-08	0.1378
rs2880099	4	1.56E+0 8	A	A	0.215056	1.67E-21	0.2079
rs1123037	4	1.57E+0 8	T	A	0.479233	1.09E-14	0.9096
rs11100007	4	1.57E+0 8	A	G	0.176318	1.61E-09	0.8853
rs13139571	4	1.57E+0 8	C	A	0.211462	2.60E-13	0.5208
rs148004190	4	1.57E+0 8	C	T	0.126797	4.07E-10	0.6701
rs6819297	4	1.57E+0 8	G	T	0.233826	4.78E-10	0.01857
rs1425486	4	1.58E+0 8	C	C	0.466454	1.75E-10	0.1633
rs6555205	5	360543	C	T	0.460264	6.59E-11	0.2173
rs10069690	5	1279790	C	T	0.347644	1.38E-08	0.3012
rs954767	5	3706050	A	C	0.267173	3.95E-11	0.143
rs2921604	5	1486794 8	T	C	0.406949	2.73E-08	0.06576

rs1458051	5	3268947 2	G	A	0.21266	9.74E-09	0.1153
rs9716700	5	3271163 3	C	A	0.067492	5.23E-11	0.533
rs10053638	5	3276038 3	T	C	0.142572	1.08E-10	0.04591
rs72742734	5	3277327 5	A	G	0.023363	1.00E-10	0.05752
rs12656497	5	3283193 9	T	T	0.405551	1.74E-08	0.187
rs146816907	5	3287621 0	G	A	0.007588	2.90E-11	0.4772
rs1494651	5	3294083 9	G	A	0.314497	1.30E-10	0.1172
rs10941043	5	3319475 1	T	G	0.257388	8.46E-10	0.4468
rs2940928	5	4242390 5	A	A	0.13758	7.44E-09	0.5366
rs6875967	5	5087829 2	A	A	0.370407	2.81E-13	0.4691
rs1694068	5	5328363 0	T	T	0.315895	1.99E-13	0.6795
rs10054208	5	5568899 2	C	T	0.308906	1.97E-08	0.4807
rs13179413	5	5586809 7	C	T	0.225839	2.10E-08	0.8797
rs984113	5	5591253 3	G	G	0.486821	2.20E-13	0.7987
rs1035514	5	5603787 8	G	G	0.144768	1.30E-08	0.03753
rs2221678	5	5637364 4	G	A	0.319089	2.11E-08	0.5497
rs17735275	5	5655894 9	G	A	0.01258	3.36E-08	0.07142
rs10036435	5	5674483 3	C	G	0.098642	5.29E-13	0.8478
rs12515541	5	5709501 1	G	G	0.397364	1.21E-11	0.6364
rs13170721	5	5735919 2	C	G	0.03774	9.04E-10	0.7987
rs1848510	5	5775400 5	G	A	0.403155	2.86E-09	0.2664
rs10062049	5	6155388 1	C	T	0.18111	1.77E-11	0.8544

rs6889240	5	6632094 0	A	G	0.124401	6.59E-09	0.6779
rs10066799	5	6770839 0	G	T	0.383986	3.12E-09	0.3391
rs152130	5	6800689 8	A	G	0.226438	1.24E-08	0.5134
rs2307111	5	7500367 8	T	T	0.384385	7.98E-10	0.6272
rs4704514	5	7782008 1	C	T	0.214257	4.37E-11	0.06999
rs10042590	5	8777331 8	G	A	0.056709	1.75E-10	0.9413
rs17422386	5	8786582 5	G	A	0.017372	7.40E-09	0.5461
rs62380354	5	8948491 1	A	C	0.038339	7.84E-14	0.1486
rs4489092	5	9042064 4	G	T	0.441693	3.14E-09	0.2954
rs77151571	5	9184336 9	T	C	0.094649	1.78E-08	0.4722
rs7731530	5	9198335 4	C	C	0.215256	3.94E-14	0.5154
rs28081	5	9609299 0	A	A	0.215455	1.07E-09	0.1555
rs55770741	5	9622008 7	C	C	0.341653	9.51E-10	0.669
rs1871190	5	9795371 9	G	T	0.308706	1.57E-13	0.9588
rs9326869	5	1.12E+0 8	T	T	0.215855	1.60E-27	0.072
rs11241305	5	1.14E+0 8	C	A	0.353834	9.62E-21	0.02309
rs450354	5	1.22E+0 8	T	T	0.07508	6.43E-13	0.6721
rs1422278	5	1.22E+0 8	G	T	0.24361	4.43E-08	0.8958
rs13156484	5	1.23E+0 8	G	G	0.426717	2.32E-10	0.107
rs57885458	5	1.23E+0 8	T	C	0.147963	3.40E-08	0.326
rs6892983	5	1.28E+0 8	C	A	0.480232	2.80E-10	0.5942
rs2667735	5	1.32E+0 8	A	A	0.11901	4.22E-10	0.1091

rs736801	5	1.32E+0 8	C	T	0.134585	2.83E-18	0.3543
rs55747751	5	1.32E+0 8	G	A	0.019169	1.30E-08	0.1811
rs7708525	5	1.42E+0 8	T	T	0.116014	3.38E-08	0.4724
rs3776299	5	1.43E+0 8	G	A	0.252196	1.30E-19	0.6792
rs9716164	5	1.48E+0 8	C	T	0.471246	1.49E-08	0.2457
rs78909293	5	1.48E+0 8	T	C	0.077875	8.67E-13	0.09786
rs994446	5	1.48E+0 8	G	A	0.277556	4.92E-08	0.5409
rs3117736	5	1.57E+0 8	C	T	0.208466	2.77E-09	0.5038
rs1650554	5	1.58E+0 8	G	G	0.388179	5.21E-99	0.249
rs62385131	5	1.58E+0 8	C	T	0.013578	2.41E-19	0.5183
rs113644149	5	1.58E+0 8	G	A	0.023363	7.37E-19	0.9736
rs11960210	5	1.58E+0 8	T	C	0.415335	8.52E-09	0.5198
rs2963444	5	1.58E+0 8	C	G	0.378994	1.29E-09	0.5862
rs34296591	5	1.58E+0 8	C	G	0.23143	9.82E-09	0.7943
rs2546963	5	1.60E+0 8	C	C	0.49381	7.23E-10	0.6754
rs6555948	5	1.71E+0 8	A	A	0.454473	3.72E-08	0.03266
rs114503346	5	1.72E+0 8	C	T	0.015575	6.23E-11	0.2178
rs28362590	5	1.77E+0 8	G	G	0.287939	3.48E-13	0.161
rs2569882	6	1620147	T	T	0.375	1.11E-08	0.0872
rs9406076	6	8023804	C	T	0.333666	1.46E-18	0.24
rs2282823	6	1547833 6	C	C	0.114617	8.28E-84	0.2403
rs61408836	6	1730285 7	C	T	0.205272	1.27E-16	0.1824
rs35261542	6	2067579 2	C	A	0.277556	6.52E-10	0.8934

rs1543310	6	2211041 8	T	T	0.246206	2.53E-08	0.1112
rs2744133	6	2239226 0	A	G	0.184105	8.73E-37	0.6511
rs2182931	6	2539724 6	G	G	0.365016	4.95E-21	0.3738
rs9348687	6	2559248 9	A	A	0.446486	5.95E-10	0.6901
rs4712955	6	2568427 9	A	A	0.401358	2.90E-10	0.7717
rs9348689	6	2568465 3	G	T	0.488219	9.84E-24	0.9601
rs76376636	6	2591688 8	G	A	0.007189	5.06E-09	0.669
rs13196986	6	2609045 2	T	C	0.312899	9.62E-09	0.03388
rs1800562	6	2609314 1	G	A	0.01258	2.84E-08	0.1678
rs198851	6	2610463 2	T	T	0.073283	4.32E-14	0.4577
rs74571768	6	2612254 7	G	A	0.091653	2.98E-09	0.1508
rs16891474	6	2623945 3	T	G	0.171526	7.44E-15	0.05977
rs113352426	6	2644762 5	C	T	0.029553	3.38E-08	0.4675
rs6456739	6	2660414 0	T	T	0.362819	3.17E-08	0.0692
rs9348765	6	2731465 0	A	T	0.296725	4.49E-08	0.7804
rs175954	6	2801158 5	A	G	0.257987	1.03E-11	0.09677
rs416568	6	2964762 8	T	A	0.34345	5.69E-11	0.4672
rs3129054	6	2964905 6	C	T	0.336462	3.99E-25	0.5672
rs116306020	6	3096267 8	G	A	0.029553	7.59E-09	0.3455
rs4495304	6	3108071 8	T	C	0.103035	8.07E-10	0.1064
rs1265102	6	3110278 1	A	G	0.261182	3.72E-45	0.04218
rs2854001	6	3132301 2	G	A	0.145966	4.81E-19	0.4857

rs2534687	6	3146160 8	C	T	0.35643	2.42E-12	0.9362
rs1144708	6	3171002 0	C	C	0.497604	2.81E-15	0.09047
rs62395847	6	3185081 3	T	C	0.010783	3.70E-11	0.6749
rs115521166	6	3193006 3	G	A	0.013778	1.55E-10	0.1069
rs389883	6	3194746 0	G	G	0.160743	8.12E-10	0.9586
rs9270623	6	3256533 1	A	C	0.214856	3.76E-14	0.3021
rs17425622	6	3257196 1	T	C	0.083666	1.07E-08	0.7468
rs150359	6	3292206 8	A	A	0.430312	9.75E-18	0.7621
rs3130165	6	3313022 6	C	G	0.317692	9.13E-15	0.03863
rs41317098	6	3314446 6	C	A	0.102436	1.36E-09	0.6676
rs4713650	6	3361682 8	C	C	0.360823	1.29E-08	0.07378
rs115245297	6	3424413 2	T	C	0.012979	6.10E-13	0.6612
rs4714224	6	3918674 3	G	C	0.267971	4.44E-16	0.0395
rs56370893	6	3929788 5	G	A	0.066094	1.58E-19	0.01579
rs6912283	6	4336449 4	G	A	0.418131	1.14E-10	0.2051
rs78345441	6	4373326 1	A	G	0.017772	4.19E-09	0.5265
rs6905288	6	4375887 3	G	G	0.354832	1.29E-09	0.9732
rs9472135	6	4380980 2	T	C	0.195487	7.73E-28	0.1164
rs6458374	6	4418131 5	C	C	0.197883	5.08E-10	0.06384
rs78648104	6	5068300 9	T	C	0.079473	1.22E-08	0.2556
rs7772884	6	5104092 6	T	T	0.386581	1.45E-10	0.02708
rs714785	6	5153698 3	G	A	0.013978	1.17E-10	0.7845

rs481795	6	5156887 1	T	T	0.325479	3.09E-08	0.07293
rs6458798	6	5171907 4	A	A	0.063698	4.40E-24	0.6386
rs9296668	6	5183826 3	A	G	0.337061	2.22E-08	0.8311
rs62413470	6	5599953 7	G	A	0.164537	1.35E-11	0.2432
rs504691	6	7220662 0	C	A	0.454872	4.84E-18	0.2526
rs1984195	6	7965739 1	G	G	0.491813	8.91E-10	0.5047
rs7753695	6	8081853 1	C	T	0.38778	2.03E-08	0.3728
rs7763102	6	8227923 7	C	A	0.194089	1.38E-32	0.1785
rs16875357	6	8565290 4	T	G	0.217053	3.56E-08	0.01191
rs3798293	6	9703337 0	A	G	0.146565	7.90E-12	0.1328
rs9496614	6	1.01E+0 8	T	C	0.173123	5.40E-12	0.03509
rs72613227	6	1.06E+0 8	A	T	0.127995	9.77E-13	0.8049
rs9386780	6	1.10E+0 8	A	A	0.421326	5.06E-09	0.9818
rs3822857	6	1.16E+0 8	G	C	0.253395	9.56E-10	0.6778
rs631089	6	1.17E+0 8	C	A	0.339058	4.19E-23	0.03397
rs2693560	6	1.18E+0 8	A	A	0.290935	1.30E-13	0.2631
rs56240052	6	1.19E+0 8	A	G	0.016973	9.95E-10	0.5758
rs11153730	6	1.19E+0 8	T	C	0.326877	9.05E-10	0.4463
rs9401090	6	1.19E+0 8	T	C	0.232428	2.27E-12	0.5734
rs9375033	6	1.22E+0 8	T	T	0.407748	3.53E-08	0.1542
rs2269579	6	1.22E+0 8	A	G	0.306709	2.19E-09	0.01511
rs1268123	6	1.26E+0 8	C	T	0.078474	5.70E-12	0.05512

rs9321065	6	1.27E+08	G	G	0.421925	6.33E-09	0.2307
rs9401911	6	1.27E+08	T	C	0.027157	7.11E-37	0.408
rs13215166	6	1.27E+08	A	G	0.359026	1.20E-31	0.6558
rs185867463	6	1.27E+08	G	C	0.010783	5.22E-14	0.7214
rs75718977	6	1.34E+08	T	C	0.02496	3.81E-12	0.03232
rs12192720	6	1.34E+08	G	A	0.426518	3.45E-09	0.7406
rs9399136	6	1.35E+08	T	C	0.149161	9.54E-22	0.8376
rs668459	6	1.40E+08	C	T	0.481829	3.32E-10	0.8308
rs645144	6	1.41E+08	T	C	0.338259	6.30E-24	0.3798
rs13195550	6	1.43E+08	C	T	0.232228	2.08E-15	0.6369
rs9399437	6	1.44E+08	G	A	0.229233	1.92E-08	0.5986
rs588273	6	1.48E+08	A	G	0.491613	7.59E-09	0.6984
rs17080093	6	1.51E+08	C	T	0.158147	2.01E-12	0.07276
rs851966	6	1.52E+08	A	A	0.436701	1.16E-09	0.6848
rs9478282	6	1.52E+08	C	T	0.267971	7.33E-28	0.3183
rs2695258	6	1.53E+08	C	T	0.210264	3.07E-09	0.6874
rs9479509	6	1.53E+08	G	A	0.39976	5.63E-10	0.1064
rs9456648	6	1.62E+08	C	T	0.1248	6.95E-10	0.1334
rs12665161	6	1.64E+08	G	A	0.342652	8.55E-09	0.467
rs4709746	6	1.64E+08	C	T	0.106629	1.43E-15	0.7595
rs2934849	6	1.66E+08	T	T	0.299321	1.64E-08	0.9847
rs11961593	6	1.66E+08	C	T	0.195487	2.78E-14	0.8396

rs1322639	6	1.70E+08	G	G	0.334065	2.60E-08	0.7963
rs73033340	7	1195692	A	G	0.011182	8.69E-10	0.6887
rs12702448	7	1205975	G	G	0.47504	5.18E-10	0.6842
rs3996330	7	2018823	C	C	0.430312	1.32E-09	0.1392
rs2906152	7	2523003	G	G	0.229433	1.87E-11	0.01363
rs798502	7	2789880	A	C	0.209864	2.94E-08	0.582
rs1468520	7	7290732	A	G	0.294728	2.04E-13	0.1878
rs13240040	7	14375977	A	G	0.29373	8.62E-11	0.5897
rs818508	7	16719917	T	C	0.357628	6.96E-12	0.9997
rs11543651	7	18590659	T	C	0.278355	2.72E-16	0.3696
rs4507656	7	22156538	C	G	0.20627	4.24E-10	0.4778
rs2040637	7	25694474	A	A	0.303914	9.63E-17	0.005441
rs896312	7	25935030	T	C	0.398962	3.61E-09	0.3789
rs1725074	7	27144921	C	T	0.253994	1.51E-10	0.01943
rs3779456	7	27214557	T	C	0.398562	2.01E-09	0.7405
rs3735533	7	27245893	T	T	0.133387	4.12E-09	0.5197
rs12535894	7	27329173	C	G	0.097444	2.73E-08	0.4712
rs10245801	7	27394232	A	A	0.25619	5.72E-10	0.5964
rs3206736	7	35238532	A	T	0.398562	1.16E-13	0.03992
rs343000	7	35477175	C	C	0.193091	1.05E-08	0.4606
rs73105827	7	45036785	G	T	0.034545	8.46E-65	0.0624
rs10260816	7	46010100	C	G	0.475639	1.60E-13	0.1831
rs17454517	7	50915776	A	A	0.397165	3.44E-14	0.7386
rs1178979	7	72856430	T	C	0.171725	4.92E-14	0.04598
rs3807101	7	80393418	C	T	0.106829	4.72E-17	0.1286

rs39281	7	8977848 9	A	G	0.339457	5.10E-12	0.4574
rs1947228	7	9646164 9	T	C	0.374201	2.89E-11	0.8282
rs7788746	7	9961240 5	G	G	0.358027	4.75E-11	0.1162
rs314376	7	1.00E+0 8	A	G	0.463059	1.29E-08	0.02254
rs4556017	7	1.01E+0 8	C	C	0.052915	6.94E-14	0.7329
rs12536606	7	1.08E+0 8	C	T	0.169728	5.19E-13	0.01821
rs2402668	7	1.23E+0 8	T	T	0.201877	9.88E-17	0.678
rs11556924	7	1.30E+0 8	C	T	0.155751	1.67E-82	0.4434
rs3996352	7	1.30E+0 8	A	G	0.343251	1.80E-09	0.04924
rs10228513	7	1.31E+0 8	T	T	0.488818	1.77E-08	0.2453
rs75511781	7	1.31E+0 8	A	G	0.035743	2.92E-08	0.5885
rs6957161	7	1.31E+0 8	A	A	0.394169	1.30E-11	0.5784
rs1722886	7	1.34E+0 8	A	T	0.489816	3.50E-11	0.9833
rs12703989	7	1.40E+0 8	G	A	0.322883	1.62E-23	0.04742
rs3735318	7	1.49E+0 8	G	G	0.395168	5.95E-15	0.3859
rs58391005	7	1.50E+0 8	G	A	0.213458	6.89E-11	0.5944
rs66743416	7	1.50E+0 8	C	T	0.118411	1.12E-09	0.778
rs741066	7	1.51E+0 8	C	T	0.196486	6.28E-25	0.08545
rs956642	7	1.51E+0 8	G	G	0.323083	1.28E-11	0.08118
rs3807377	7	1.51E+0 8	A	G	0.430511	1.39E-13	0.3252
rs3918226	7	1.51E+0 8	C	T	0.028954	2.37E-08	0.2388
rs891511	7	1.51E+0 8	G	G	0.479633	3.13E-13	0.6322

rs79684285	7	1.51E+0 8	C	T	0.007987	3.23E-10	0.2072
rs10246655	7	1.51E+0 8	G	C	0.316494	2.72E-11	0.9894
rs6464165	7	1.51E+0 8	T	C	0.178914	1.15E-08	0.2406
rs1870735	7	1.56E+0 8	C	C	0.442692	6.89E-14	0.937
rs9638084	7	1.56E+0 8	A	G	0.498802	3.43E-09	0.6978
rs11136373	8	1212030	C	C	0.341054	1.34E-14	0.2373
rs7461159	8	1716616	T	T	0.278355	3.20E-09	0.3299
rs2922895	8	6379932	G	C	0.364217	3.35E-14	0.07384
rs62491544	8	9511555	G	A	0.133786	5.87E-10	0.5125
rs7386288	8	1153633 2	T	T	0.384585	1.39E-13	0.06136
rs79838296	8	1741907 4	G	A	0.022963	5.54E-11	0.8667
rs62503324	8	2340061 5	C	C	0.499401	1.61E-12	0.08396
rs6981463	8	2344809 5	C	C	0.177117	6.82E-23	0.5344
rs951914	8	2587899 5	G	G	0.323882	2.99E-08	0.7502
rs58429174	8	2601192 2	C	T	0.266973	1.76E-25	0.07029
rs77375686	8	2604362 2	A	G	0.042732	7.68E-15	0.8851
rs28845194	8	2641071 0	T	T	0.291933	3.12E-18	0.4897
rs17321041	8	2644519 4	C	T	0.051118	3.28E-39	0.7026
rs1842646	8	2674393 3	A	A	0.460663	1.19E-08	0.3246
rs2979470	8	3028827 2	T	T	0.416933	7.36E-34	0.3217
rs1906672	8	3813002 5	G	A	0.211462	3.51E-11	0.9898
rs72639047	8	4941559 8	G	A	0.102037	4.76E-68	0.1825
rs4873492	8	5194754 9	C	T	0.262979	3.38E-08	0.6504
rs11778153	8	6450394 2	T	C	0.139976	4.17E-08	0.8268

rs7817000	8	6891946 3	C	A	0.45607	6.10E-12	0.8834
rs7843475	8	7247574 8	C	C	0.426717	5.88E-09	0.07924
rs4007357	8	7724541 0	G	G	0.303714	3.06E-08	0.695
rs148401029	8	8138606 6	C	A	0.026358	5.45E-09	0.4164
rs4739832	8	8281201 9	A	C	0.402556	2.01E-08	0.6285
rs2142141	8	9094020 5	G	G	0.202077	4.80E-14	0.4934
rs11781001	8	9604407 6	G	A	0.099042	7.24E-12	0.4418
rs2978098	8	1.02E+0 8	A	A	0.337061	6.51E-21	0.3858
rs142449193	8	1.03E+0 8	C	T	0.0623	8.74E-10	0.5691
rs2513877	8	1.04E+0 8	G	A	0.30651	4.94E-11	0.5045
rs35783704	8	1.06E+0 8	G	A	0.03155	7.03E-18	0.3796
rs2957468	8	1.06E+0 8	A	A	0.308906	4.01E-23	0.3472
rs722783	8	1.20E+0 8	G	A	0.119209	3.63E-09	0.08877
rs4871494	8	1.21E+0 8	A	A	0.032548	8.21E-14	0.6568
rs13270541	8	1.25E+0 8	G	A	0.436302	2.14E-08	0.6797
rs12114418	8	1.27E+0 8	A	G	0.390375	3.36E-08	0.5124
rs4380895	8	1.29E+0 8	A	T	0.403554	1.74E-17	0.2531
rs4909314	8	1.36E+0 8	T	A	0.376797	8.56E-12	0.6076
rs4074812	8	1.42E+0 8	G	A	0.344449	2.12E-18	0.5946
rs11167039	8	1.42E+0 8	G	G	0.13139	3.49E-13	0.01348
rs36092215	8	1.42E+0 8	G	A	0.081869	1.49E-79	0.8267
rs60818561	8	1.42E+0 8	C	G	0.062899	1.17E-11	0.9087

rs12549801	8	1.42E+0 8	A	A	0.338458	1.96E-15	0.1317
rs12675715	8	1.43E+0 8	T	T	0.373403	1.74E-08	0.8591
rs7387891	8	1.43E+0 8	A	A	0.414537	5.08E-11	0.1579
rs3802230	8	1.44E+0 8	C	C	0.404153	1.64E-17	0.3054
rs72693377	8	1.45E+0 8	C	T	0.011182	2.31E-09	0.2017
rs1536608	9	223613	T	T	0.335264	1.93E-08	0.4263
rs12337056	9	628670	C	T	0.107827	2.54E-23	0.448
rs12216886	9	2493751	T	G	0.21226	1.40E-11	0.02279
rs1332812	9	9350986	T	T	0.467452	2.75E-09	0.3412
rs35287509	9	1059463 5	T	C	0.172923	3.97E-08	0.9856
rs4615669	9	2181867 4	A	G	0.324081	1.72E-17	0.9979
rs1243876	9	3569310 4	C	C	0.335064	2.15E-08	0.9395
rs76452347	9	3590647 1	C	T	0.094249	1.97E-13	0.7298
rs11141731	9	8988847 2	C	T	0.11861	1.45E-08	0.7448
rs4743021	9	1.09E+0 8	T	T	0.465855	1.31E-08	0.04764
rs7020564	9	1.10E+0 8	A	T	0.496006	2.42E-17	0.1901
rs7043304	9	1.12E+0 8	C	C	0.073482	1.99E-28	0.4419
rs12555129	9	1.13E+0 8	G	T	0.207668	6.10E-09	0.4472
rs2900508	9	1.13E+0 8	G	A	0.3752	1.93E-18	0.3282
rs10980408	9	1.13E+0 8	T	C	0.058906	8.31E-15	0.4499
rs10759697	9	1.17E+0 8	G	A	0.40635	3.07E-18	0.6676
rs112332688	9	1.19E+0 8	A	G	0.071486	3.05E-12	0.6752
rs1861881	9	1.19E+0 8	G	T	0.283347	3.09E-08	0.6482
rs937481	9	1.28E+0 8	C	C	0.441693	1.44E-17	0.5742

rs4837127	9	1.30E+08	C	T	0.227037	2.80E-08	0.8766
rs507666	9	1.36E+08	G	A	0.141374	3.69E-08	0.5725
rs6271	9	1.37E+08	C	T	0.020767	7.66E-10	0.533
rs11145807	9	1.40E+08	A	G	0.378395	1.833E-08	0.2258
