

Title:

Unhealthy Behaviours and Risk of Parkinson's Disease: A Mendelian Randomisation Study

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## **Abstract**

**Background:** Tobacco smoking and alcohol intake have been identified in observational studies as potentially protective factors against developing Parkinson's disease (PD); the impact of BMI on PD risk is debated. Whether such epidemiological associations are causal remains unclear. Mendelian randomisation (MR) uses genetic variants to explore the effects of exposures on outcomes; potentially reducing bias from residual confounding and reverse causation.

**Objectives:** Using MR, we examined relationships between PD risk and three unhealthy behaviours: tobacco smoking, alcohol intake, and higher BMI.

**Methods:** 19,924 PD cases and 2,413,087 controls were included in the analysis. We performed genome-wide association studies to identify single nucleotide polymorphisms associated with tobacco smoking, alcohol intake, and BMI. MR analysis of the relationship between each exposure and PD was undertaken using a split-sample design.

**Results:** Ever-smoking reduced the risk of PD (OR 0.955; 95% confidence interval [CI] 0.921-0.991;  $p=0.013$ ). Higher daily alcohol intake increased the risk of PD (OR 1.125, 95% CI 1.025-1.235;  $p=0.013$ ) and a 1 kg/m<sup>2</sup> higher BMI reduced the risk of PD (OR 0.988, 95% CI 0.979-0.997;  $p=0.008$ ). Sensitivity analyses did not suggest bias from horizontal pleiotropy or invalid instruments.

**Conclusions:** Using split-sample MR in over 2.4 million participants, we observed a protective effect of smoking on risk of PD. In contrast to observational data, alcohol consumption appeared to increase the risk of PD. Higher BMI had a protective effect on PD, but the effect was small.

**Key words:** Parkinson's disease; 23andMe; smoking; alcohol; BMI

## **Introduction**

Observational studies have identified putative risk factors for Parkinson's disease (PD) but their effect on aetio-pathogenesis, hence their value as targets for neuroprotection, remains unclear. The impact of three phenotypes in particular - tobacco smoking, alcohol intake, high BMI - on risk of PD warrants clarification given their prevalence in the general population and their potential for modification should they modulate disease risk.

Observational data suggest that ever-smokers are 40% less likely to develop PD than never-smokers, with a dose-response relationship being observed with pack-years smoked [1]. Similarly, high alcohol intake was associated with a 22% lower risk of PD in a large-scale meta-analysis [2], although this may be driven in part by small-study bias [3]. A recent case-control study supported the negative observational associations with smoking and alcohol [4].

The role of body mass index (BMI) in risk of PD is unclear. Low BMI is apparent in patients with PD in case-control studies, however a meta-analysis of 10 prospective studies found no association between premorbid BMI and PD risk [5].

The extent to which such epidemiological associations are causal or driven by confounding factors and/or reverse causation remains unclear. Risk-averse individuals may be less likely to engage in unhealthy behaviours and more likely to develop PD [6]. Reverse causation is plausible given the long prodromal phase of PD [7]. Indeed, ease of smoking cessation and weight loss may be prodromal features of PD [8, 9].

Using Mendelian randomisation (MR), we sought to explore the nature of associations between PD risk and smoking, alcohol intake, and higher BMI. In MR, genetic variants associated with the exposure are used as instrumental variables to estimate the effect of the exposure on the outcome. The random allocation of genetic variants to offspring means that alleles are generally unrelated to confounding factors. Moreover, the germline genotype cannot be modified by the disease process, minimising bias from reverse causality. MR helps address limitations of RCTs: ethical (when the intervention is harmful, *e.g.* smoking) and pragmatic (when adherence cannot be guaranteed, *e.g.* alcohol intake, BMI modulation) [10].

## **Methods**

### Participants

Participants were customers of 23andMe, Inc., a personal genomics company. Study protocols were approved by an external AAHRPP-accredited institutional review board and conducted in accordance with the Declaration of Helsinki principles. Participants gave informed consent to participate. Data was collected between 10/11/2007 and 1/1/2018.

### Defining phenotypic traits

#### *Parkinson's disease status*

PD cases were drawn from the 23andMe participants who self-reported a diagnosis of PD. For a fuller description of recruitment see Do *et al.* [11]. If multiple PD questions were completed, participants were scored as cases if they reported being a case in any survey. Despite questionnaire data providing less diagnostic accuracy than clinically ascertained data, satisfactory level of agreement between patient-reported PD diagnosis and neurologist assessment has been demonstrated in a small validation study [12]. Participants reporting a change in their diagnosis or uncertainty relating to their diagnosis were excluded. Controls were drawn from the 23andMe participants who self-reported never having been diagnosed with PD. We also removed cases and controls who self-reported having ever been diagnosed with: 1) atypical parkinsonism (*e.g.* dementia with Lewy bodies, progressive supranuclear palsy, multiple system atrophy, corticobasal degeneration) or a non-parkinsonian tremor disorder; or 2) stroke, deep vein thrombosis, or pulmonary embolism (to reduce the probability of including individuals with vascular parkinsonism). 19,924 PD cases and 2,413,087 controls were included in the analysis. For a description of how 23andMe research participants with PD compare phenotypically to those without PD, see Heilbron *et al.* 2019 [4].

### *Unhealthy exposures of interest*

Participants self-reported tobacco smoking habits with response categories “ever-smoker (>100 cigarettes smoked in lifetime)”, or “never-smoker (<100 cigarettes smoked in lifetime)”. Our tobacco use phenotype followed the established standard definition used by the US Centers for Disease Control and Prevention (CDC) in their National Health Interview Survey [13]. Participants self-reported the number of alcohol measures consumed per day over the past two weeks, where 1 measure corresponds to 12 oz. of beer, 5 oz. of wine, or 1.5 oz of spirits. Response options were grouped as: 0, 0-1, 1, 2, 3, 4, 5 or more measures.

Participants self-reported their mass (in kilograms) and height (in metres) squared, from which BMI was calculated. The majority of the exposure data was collected when a 23andMe research participant completed their first survey. If multiple tobacco use questions were completed, participants were scored as ever-smokers if they reported being an ever-smoker in any survey. If multiple alcohol use, mass, height, or PD questions were completed, the first non-missing value was taken from an ordered list of surveys. Responses were highly concordant across surveys (*e.g.*  $r = 0.978$  between the top two PD surveys). We opted to use 23andMe exposure data to create genetic instruments for each trait of interest rather than external data because of the large available sample sizes and resulting statistical power.

### Genome-wide association studies

We performed new GWAS for each exposure using unrelated individuals. We selected unrelated individuals using a segmental identity-by-descent estimation algorithm [14]. Individuals were defined as related if they shared 700 cM identity-by-descent, including regions where the two individuals share one or both genomic segments identical-by-descent. This level of relatedness (~20% of the genome) corresponds approximately to the minimal

expected sharing between first cousins in an outbred population. Ancestry composition was performed as previously reported [15]. Inclusion was restricted to individuals of predominantly European ancestry to minimise confounding by ancestry.

DNA extraction and genotyping were performed on saliva samples by National Genetics Institute. Samples were genotyped on one of five Illumina-based genotyping platforms. The v1 and v2 platforms were variants of the Illumina HumanHap550+ BeadChip, including about 25,000 custom SNPs selected by 23andMe, with a total of about 560,000 SNPs. The v3 platform was based on the Illumina OmniExpress+ BeadChip, with custom content to improve the overlap with our v2 array, with a total of about 950,000 SNPs. The v4 platform was a fully customized array, including a lower redundancy subset of v2 and v3 SNPs with additional coverage of lower-frequency coding variation, and about 570,000 SNPs. The v5 platform is an Illumina Infinium Global Screening Array (~640,000 SNPs) supplemented with ~50,000 SNPs of custom content. Samples had minimum call rates of 98.5%.

We phased participant data using either an internally-developed tool, Finch (V1-V4 genotyping arrays) or Eagle2 (V5 genotyping array) [16]. Finch implements the Beagle haplotype graph-based phasing algorithm, modified to separate the haplotype graph construction and phasing steps [17]. It extends the Beagle model to accommodate genotyping error and recombination, to handle cases where there are no consistent paths through the haplotype graph for the individual being phased. We constructed haplotype graphs for European and non-European samples on each 23andMe genotyping platform from a representative sample of genotyped individuals, and then performed out-of-sample phasing of all genotyped individuals against the appropriate graph. For the X-chromosome, we built



separate haplotype graphs for the non-pseudoautosomal region and each pseudoautosomal region, and these regions were phased separately.

### *Imputation*

Imputation panels created by combining multiple smaller panels have been shown to give better imputation performance than the individual constituent panels alone [18]. To that end, we combined the May 2015 release of the 1000 Genomes Phase 3 haplotypes with the UK10K imputation reference panel to create a single unified imputation reference panel [19, 20]. Multiallelic sites with N alternate alleles were split into N separate biallelic sites. We then removed any site whose minor allele appeared in only one sample. For each chromosome, we used Minimac3 to impute the reference panels against each other, reporting the best-guess genotype at each site [21]. This gave us calls for all samples over a single unified set of variants. We then joined these together to get, for each chromosome, a single VCF with phased calls at every site for 6,285 samples.

In preparation for imputation we split each chromosome of the reference panel into chunks of no more than 300,000 variants, with overlaps of 10,000 variants on each side. We used a single batch of 10,000 individuals to estimate Minimac3 imputation model parameters for each chunk [21]. We imputed phased participant data against the chunked merged reference panel using Minimac3, treating males as homozygous pseudo-diploids for the non-pseudoautosomal region. Throughout, we treated structural variants and small indels the same as SNPs.

### *Association tests*

We computed association test results by regression assuming additive allelic effects (logistic regression for case-control traits [PD, tobacco use], linear regression for quantitative traits [alcohol consumption, BMI]). We included covariates for age, sex, the top five genetic principal components to account for residual population structure, and indicators for genotype platforms to account for genotype batch effects. The association test p-value we report was computed using a likelihood ratio test. For tests using imputed data, we use the imputed dosages rather than best-guess genotypes. For the X-chromosome, male genotypes were coded as if they were homozygous diploid for the observed allele.

#### *Principal component analysis*

We performed the genetic principal components analysis using ~65,000 high-quality genotyped variants present in all five genotyping platforms and a random sample of one million research participants with predominantly European ancestry. Principal component scores for participants not included in the analysis were obtained by projection, combining the eigenvectors of the analysis and the SNP weights.

#### *Quality control of genotyped GWAS results*

We excluded SNPs that: 1) had a call rate <90%, 2) had a Hardy-Weinberg  $P < 10^{-20}$  in people with predominantly European ancestry, 3) were only genotyped on the V1 and/or V2 platforms, 4) were found on the mitochondrial chromosome or the Y-chromosome, 5) failed a test for parent-offspring transmission (specifically, we regressed the child's allele count against the mean parental allele count and excluded SNPs with fitted  $\beta < 0.6$  and  $P < 10^{-20}$  for a test of  $\beta < 1$ ), 6) had an association with genotype date ( $P < 10^{-50}$  by ANOVA of SNP genotypes against a factor dividing genotyping date into 20 roughly equal-sized buckets), 7)

had a large sex effect (ANOVA of SNP genotypes,  $r^2 > 0.1$ ), or 8) had probes matching multiple genomic positions in the reference genome.

#### *Quality control of imputed GWAS results*

We excluded SNPs with imputed  $r^2 < 0.3$ , as well as SNPs that had strong evidence of a platform batch effect. For each SNP we identified the largest subset of the data passing other quality control criteria based on their original genotyping platform – either v2+v3+v4+v5, v4+v5, v4, or v5 only – and computed association test results for the largest passing set. The batch effect test is an F test from an ANOVA of the SNP dosages against a factor representing the V4 or V5 platform; we excluded results with  $P < 10^{-50}$ .

#### *Additional quality control of GWAS results*

Across both genotyped and imputed GWAS results, we excluded SNPs that had sample size of less than 20% of the total GWAS sample size. We also removed SNPs that did not converge during logistic regression, as identified by  $\text{abs}(\text{effect}) > 10$  or  $\text{stderr} > 10$  on the log-odds scale. We removed SNPs with  $\text{MAF} < 0.1\%$  from linear regressions because these SNPs are sensitive to violations of the regression assumption of normally distributed residuals. If SNPs were both genotyped and imputed, and they passed QC for both, we used results from the imputed analysis.

After quality control, we had analysed 904,040 genotyped SNPs and 25,208,208 imputed SNPs.

#### Instrument construction

SNPs associated with each of the exposures at the genome-wide significance level ( $p < 5e^{-8}$ ) were included as instrumental variables. We excluded SNPs with a minor allele frequency  $< 3\%$  and SNPs in the *HLA* locus (hg19, chromosome 6, 26.0Mbp - 33.7Mbp). Instrument strength was assessed using the mean F statistic, as calculated by the `system_metrics` function in the `TwoSampleMR` R package [22].

### Split-sample MR analysis

We performed MR analysis of the relationship between the exposures of interest and PD using a split-sample design, in accordance with published methods [23, 24]. Individuals from the 23andMe cohort were randomly allocated into two evenly sized groups (Table 1).

Demographic differences between cases and controls across cohorts are shown in Table 2.

The instrument-exposure association was measured in the first group (cohort 1), and the instrument-outcome association was measured in the second group (cohort 2), and MR analyses undertaken. We then repeated the MR analyses, but using cohort 1 for the outcome and cohort 2 for the exposure. For each MR method, this resulted in two independent MR estimates, which were combined using an inverse variance weighted (IVW) fixed-effects meta-analysis.

The effect of an exposure on PD was calculated for each SNP using the Wald ratio method [25]. In the IVW analysis we performed a linear regression constrained through the origin of the variant-exposure and the variant-outcome associations for each instrument, weighted by their inverse variance.

We used four methods to assess the impact of bias on IVW estimates [22]. Heterogeneity in Wald ratio estimates, which can indicate bias due to horizontal pleiotropy, was assessed using

the Cochran's Q test and  $I^2$  index [26]. Individual variant contributions to Cochran's Q was calculated, and variants were excluded in the heterogeneity filtering analysis if their contribution surpassed the Bonferroni-corrected 99.8<sup>th</sup> percentile of the  $\chi^2$  (1df) distribution. We performed MR-Egger analysis to assess the magnitude of bias occurring due to horizontal pleiotropy, the weighted median method to assess for invalid instruments, and generalised summary data-based MR (GSMR) to filter out pleiotropic SNPs (Table 1 Supplementary Data).

To minimize misallocation of variants to the exposure rather than outcome group, we applied Steiger filtering to all analyses to remove genetic variants that had a stronger correlation with the outcome than with the exposure [27].

#### Replication in the International Parkinson's Disease Genomics Consortium (IPDGC) dataset

Summary statistics from the largest published PD GWAS meta-analysis were used as the outcome data for replication after excluding data from 23andMe (the "IPDGC dataset") [28]. The outcome summary statistics used for this analysis included 15,056 cases, 18,618 proxy cases, and 449,056 controls, and there were 17,410,431 genotyped and imputed SNPs tested for association with PD. Recruitment and genotyping quality control are described in the original report [28]. Only exposure SNPs from cohort 1 were used in the replication analysis, and we excluded SNPs on the X-chromosome and palindromic SNPs.

#### Sensitivity analyses

If tobacco use has a protective effect on PD, we would expect genetic variants that increase the tobacco use to decrease PD risk in tobacco users, but to have no effect on PD risk in non-

users. If these variants are protective for PD in separate analyses of both ever-smokers and never-smokers, however, this suggests that the protective effect is mediated by a pleiotropic pathway unrelated to tobacco use. Given that ever/never-smoker status has a positive genetic correlation with “number of cigarettes smoked per day” ( $\rho_g=0.366$ ,  $p=4.5 \times 10^{-4}$ ), we re-ran MR analyses separately for ever-smokers and never-smokers [29]. We also repeated this analysis using a single SNP (rs16969968) that associates with a missense mutation in *CHRNA5* and has been shown to affect the amount of tobacco use within tobacco users [30]. In both analyses, we re-computed the effect of our instrument variables on PD in the same cohort, but stratifying on tobacco use status. We employed the same estimates of the effect of the tobacco use SNPs as in the main analysis. For the *CHRNA5* SNP, we used the estimate from Millard et al. that each allele that increases tobacco use is associated with an odds ratio of 1.21 for being a “heavy smoker” (95% CI: 1.19-1.23) [30]. Note that this analysis may be subject to collider bias because the variants used here are associated with the phenotype used to stratify the sample [30].

### Statistical analysis

Analyses were performed using R statistical software 3.3.2 (2016-10-31).

### Data availability statement

Summary data is available via application at 23andMe <https://research.23andme.com/dataset-access/>.

## Results

### Tobacco use

385 SNPs were associated with self-reported smoking status (ever- versus never-smoker) in cohort 1 (422 SNPs in cohort 2, Tables 2-3 Supplementary Data). These instruments explained an average of 0.80% of the variance in tobacco smoking liability in the out-of-sample cohort (cohort 1 SNPs=0.80%, cohort 2 SNPs=0.79%). The F statistic (F=54.3 in cohort 1, F=52.6 in cohort 2) was high; validating this instrument for these analyses.

In the IVW analysis, ever-smoking had the effect of reducing PD risk with an OR 0.955 (95% CI 0.921-0.991,  $p = 0.013$ ) (Fig 1). Observational multivariate-adjusted ORs for smoking on risk of PD were similar to the IVW results (Table 4 Supplementary Data). There was no clear evidence of heterogeneity in estimates derived from individual SNPs (cohort 1-versus-cohort 2: Cochran's  $Q=184.3$ ,  $p=1.000$ ; cohort 2-versus-cohort 1: Cochran's  $Q=182.4$ ,  $p=1.000$ ). The MR-Egger intercept was not significant ( $p=0.193$ ) and the estimate from MR-Egger was OR 0.867 (95% CI 0.747-1.006,  $p=0.061$ ). Funnel plots (Figure 2 A-B) suggested that individual variants were symmetrically distributed around the point estimate. These findings suggest no meaningful bias through unbalanced horizontal pleiotropy. The weighted median results (OR=0.927, 95% CI 0.857-1.002,  $p=0.058$ ) and the GSMR results (OR=0.955, 95% CI 0.905-1.008,  $p=0.096$ ) were similar to the IVW results, suggesting minimal bias due to invalid instruments. We replicated the IVW results in the IPDGC dataset (OR=0.865, 95% CI 0.756-0.990,  $p=0.035$ ) and meta-analysis of the results from the two datasets yielded a stronger p-value than results from either dataset individually (OR=0.949, 95% CI 0.916-0.983,  $p=0.003$ ) (Figure 1). There was no clear evidence of heterogeneity in MR estimates derived from the two split-sample cohorts, nor between the 23andMe and IPDGC results (Tables 5-6 Supplementary Data).

As a sensitivity analysis, we re-ran MR in the 23andMe dataset separately for ever-smokers and never-smokers. We found a similar protective effect, although less precisely estimated, in ever-smokers (OR=0.966, 95% CI 0.885-1.055) and little evidence of a protective effect in never-smokers (OR=1.030, 95% CI 0.966-1.097). We found similarly imprecise estimates when performing MR using a SNP in *CHRNA5* that strongly influences the amount of tobacco use within tobacco users (ever-smokers: OR = 1.037, 95% CI 0.888-1.211; never-smokers: OR = 1.033, 95% CI 0.849-1.256).

### Alcohol intake

129 SNPs were associated with self-reported alcohol in cohort 1 (124 SNPs in cohort 2, Tables 7-8 Supplementary Data). These instruments explained an average of 0.32% of the variance in alcohol intake liability in the out-of-sample cohort (cohort 1 SNPs=0.33%, cohort 2 SNPs=0.31%). The F statistic (F=49.5 in cohort 1, F=48.3 in cohort 2). validating this instrument for alcohol intake.

In the IVW analysis, alcohol intake had the effect of increasing PD risk with an OR 1.125 for a 1-group increase in daily alcohol intake (95% CI 1.025-1.235, p=0.013) (Figure 1). There was no clear evidence of heterogeneity against estimates derived from individual SNPs (cohort 1-versus-cohort 2: Cochran's Q=75.3, p=1.000; cohort 2-versus-cohort 1: Cochran's Q=70.9, p=1.000). The MR-Egger intercept was not significant (p=0.152) and the estimate from MR-Egger was OR 1.438 (95% CI 1.014-2.038, p=0.041). Funnel plots (Figure 3A-B) suggested that individual variants were symmetrically distributed around the point estimate, suggesting no meaningful bias through unbalanced horizontal pleiotropy. The weighted median results (OR=1.126, 95% CI 0.943-1.345, p=0.189) and the GSMR results (OR=1.125,



95% CI 0.996-1.271,  $p=0.059$ ) were consistent with the IVW results, but with wider confidence intervals, suggesting minimal bias due to invalid instruments. The point estimate in the IPDGC dataset was similar to the 23andMe result, but the confidence intervals were wide (OR=1.163, 95% CI 0.856-1.580,  $p=0.334$ ). Meta-analysis of the results from the two datasets yielded a stronger p-value than results from either dataset individually (OR=1.128, 95% CI 1.032-1.233,  $p=0.008$ ) (Figure 1).

### BMI

729 SNPs were associated with self-reported BMI in cohort 1 (693 SNPs in cohort 2, Tables 9-10 Supplementary Data). These instruments explained an average of 4.56% of the variance in BMI liability in the out-of-sample cohort (cohort 1 SNPs= 4.63%, cohort 2 SNPs=4.50%). The F statistic ( $F=99.7$  in cohort 1,  $F=102.2$  in cohort 2) indicating the validity of this instrument for BMI.

In the IVW analysis, a genetically-estimated 1 kg/m<sup>2</sup> higher BMI had the effect of reducing PD risk with an OR 0.988 (95% CI 0.979-0.997,  $p=0.008$ ) (Figure 1). There was no clear evidence of heterogeneity against estimates derived from individual SNPs (cohort 1-versus-cohort 2: Cochran's  $Q=184.3$ ,  $p=1.000$ ; cohort 2-versus-cohort 1: Cochran's  $Q=539.8$ ,  $p=1.000$ ). The MR-Egger intercept was not significant ( $p=0.223$ ) and the estimate from MR-Egger was OR 0.977 (95% CI 0.957-0.997,  $p=0.023$ ). Funnel plots (Figure 4A-B) suggested that individual variants were symmetrically distributed around the point estimate, again suggesting no meaningful bias through unbalanced horizontal pleiotropy. The weighted median results (OR=0.985, 95% CI 0.965-1.005,  $p=0.132$ ) and the GSMR results (OR=0.988, 95% CI 0.978-0.998,  $p=0.022$ ) were consistent with the IVW results, suggesting minimal bias due to invalid instruments. The causal OR in the IPDGC dataset was similar to the

23andMe result, but the confidence intervals were wide (OR=0.981, 95% CI 0.958-1.004, p=0.106). Meta-analysis of the results from the two datasets yielded a stronger p-value than results from either dataset individually (OR=0.987, 95% CI 0.979-0.995, p=0.002) (Figure 1).

## Discussion

Using split-sample MR in a cohort of >2.4 million participants, ever-smoking reduced the risk of PD by 5% compared to never-smoking. Sensitivity analyses suggested that the effect was unlikely to be driven by horizontal pleiotropy, outliers, or invalid instruments. The findings provide cautious support for a protective effect of smoking in the aetio-pathogenesis of PD.

These findings are concordant with observational studies demonstrating inverse associations between smoking and PD risk [1]. However, observational studies cannot definitively rule out reverse causality: in a study of 220,000 individuals, the protective effect of smoking on PD risk no longer held true among smokers who had quit >20 years before recruitment, meaning that preclinical dopaminergic changes facilitating smoking cessation could not be excluded [31]. Similarly, a cohort study reported that parental smoking during childhood reduced future PD risk, however a transgenerational exposure, such as a toxin influencing parental smoking behaviour and PD risk in children, could not be excluded [32]. By circumventing the use of proxy measures to overcome unmeasured/residual confounding and reverse causality, the findings from MR analyses more robustly support a protective effect.

Our results are similar to other MR studies (Table 3) exploring the relationship between PD and tobacco use. Grover *et al.* found a significant protective effect (OR=0.71 per log-odds of ever-smoking; 95% CI 0.57-0.90), while Nalls *et al.* found some evidence for a protective effect (OR=0.94 per log-odds of ever-smoking; 95% CI 0.88-1.00, p=0.063) [28, 33]. We observed a similar protective effect utilising a stringent instrument selection, large GWAS sample size and various sensitivity analyses, adding to the body of MR evidence suggesting a protective effect of tobacco smoking on the risk of PD.

Early interventional studies demonstrated beneficial effects of nicotine on motor and cognitive deficits in PD [34-41]. However placebo-controlled studies largely failed to replicate the protective association between smoking and PD [42-44]. This may be because trials assessed transient changes in PD symptoms post-nicotine in small cohorts. Given the heterogeneity in PD progression, demonstrating disease-modification would necessitate large sample sizes and long follow-up. Trials may also have failed because they examined disease-modifying effects of nicotine on established PD. However the mechanisms underlying PD risk may be different to those driving disease progression. Our study suggests that smoking influences the former, highlighting the need for prevention trials of candidate disease-modifying therapies in pre-manifest PD.

Mechanisms underlying the effect of smoking on PD risk remain speculative. A disease-modifying effect of nicotine is biologically plausible given evidence that it mitigates MPTP- and 6-hydroxydopamine-induced motor dysfunction in animal models of PD [45].

~~Interestingly, †~~ The apparent protective effect of smoking on risk of PD was not observed when stratifying the MR analysis to a SNP in *CHRNA5* that is known to strongly influence the amount of tobacco use within tobacco users. ~~This suggests that it is not the genetically-influenced heavy smoking (or response to nicotine) that influences PD risk but perhaps some other agent in cigarettes. This highlights the need to explore agents in smoking other than nicotine which may confer neuroprotection.~~ However, this analysis had little power to detect an association and yielded a confidence interval that is consistent with a detrimental, null, or beneficial effect on PD risk.

In this study we observed evidence for an increase in risk of PD with higher alcohol intake. Although a recent meta-analysis found that alcohol consumption was associated with a lower risk of PD in case-control studies (OR never vs. heavy/moderate drinking: 0.74; 95% CI 0.64-0.85), in meta-analysed cohort studies the difference was non-significant [46]. In this study we similarly observed a corresponding discrepancy between the effect of alcohol intake on risk of PD in the observational analysis (OR 0.4) and MR analysis (OR 1.1). The inverse association observed in case-control studies may be driven by reverse causation, whereby lower alcohol consumption in cases reflects a low dopaminergic state or survivor bias. Our finding is consistent with the neurotoxic effect of excess alcohol in human neuropathological studies, and with studies in rodents showing that alcohol increases oxidative damage in nigral cells [47, 48]. Our results suggest that alcohol consumption is unlikely to help prevent PD.

We have previously observed a protective effect of higher BMI on risk of PD in an MR study [49]. Recently, a hypothesis-free MR approach exploring causal associations between exposures and PD observed that most of the top hits related to a protective effect of increased adiposity [50]. The results of our study-support these previous observations.

The key strength of MR analyses is the use of genetic variants to explore the nature of associations between exposures and outcomes, thus limiting bias from residual confounding or reverse causation present in observational studies. However there are general limitations inherent to all MR studies. Firstly MR analysis assumes linearity, precluding us from identifying non-linear exposure-outcome associations. Secondly, it has been argued that survival bias may distort MR results. We mitigated this in part by employing two-sample design, which has been shown to minimise the impact of survival bias on effect estimates and

previous work has shown that the protective effect of higher BMI on risk of PD was not clearly explained by survival bias [49, 51].

Additional specific limitations of our study include that we did not explore whether effects differed between sub-groups (for example between sexes, as previously suggested for the PD-smoking association) [1]. Our phenotypes were constructed using self-reported data derived from online surveys and may therefore suffer from recall bias and desirability bias. Finally, the individuals studied were not a random sample of the general population (Table 2 for cohort demographics), potentially leading to selection bias. For example, non-randomly-sampled participants can lead to biased SNP effect estimates and alter MR results [52]. Exposures and outcomes (excluding the IPDGC data) were self-reported and therefore our SNP effects may be underestimated. Underestimated SNP effects on the exposure may lead to inflated exposure-outcome IVW estimates away from the null. Nonetheless our results are consistent with a previous MR study demonstrating a protective effect of higher BMI on risk of PD with a larger effect size [49]. **Independent replication of our findings in other datasets would provide further evidence that our findings are not an artefact of self-selection in the 23andMe cohort, including showing that our MR instrument for ever-never smoking is predictive of amount smoked.**

In conclusion, we provide evidence to support a protective effect of smoking and high BMI on PD risk. Conversely, we observed a detrimental effect of alcohol on PD risk. Although a better understanding of the underlying mechanisms, as well as development of safe delivery methods is necessary, such findings help guide the prioritisation of candidate neuroprotective approaches for RCTs in participants at risk of developing PD.

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### **Financial disclosures/Conflict of interest**

The authors have no potential conflicts of interest to report.

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## Tables

**Table 1** Table legend: Participant numbers in cohort 1 and cohort 2.

	<b>Exposure variables</b>			<b>Outcome variable</b>
	Smoking	Alcohol	BMI	Parkinson's
<b>Cohort 1</b>	Ever-smokers: 533,995	1,203,903	1,268,201	Cases: 9,852
	Never-smokers: 728,610			Controls: 1,206,650
<b>Cohort 2</b>	Ever-smokers: 533,704	1,204,410	1,267,856	Cases: 10,072
	Never-smokers: 728,847			Controls: 1,206,437

**Table 2** Table legend: Demographics of PD cases and controls in cohort 1 and cohort 2.

PD = Parkinson's disease, SD = standard deviation; N = number of individuals in a cohort.

		PD cases		Controls		P
			N		N	
Age, mean (SD), years	Cohort 1	71.0 (11.2)	9 852	49.8 (17.4)	1 206 650	<0.0001
	Cohort 2	71.1 (11.0)	10 072	49.8 (17.4)	1 206 437	<0.0001
Female, no. (%)	Cohort 1	3 967 (40.3%)	9 852	665 524 (55.2%)	1 206 650	<0.0001
	Cohort 2	3 901 (38.7%)	10 072	665 325 (55.1%)	1 206 437	<0.0001
Education, mean (SD), years	Cohort 1	16.3 (2.8)	7 058	15.8 (2.7)	1 069 986	<0.0001
	Cohort 2	16.3 (2.8)	7 306	15.8 (2.7)	1 070 797	<0.0001
Ever-smokers, no. (%)	Cohort 1	3 202 (37.8%)	8 461	428 924 (37.6%)	1 140 204	0.669
	Cohort 2	3 396 (39.3%)	8 631	428 280 (37.6%)	1 140 047	<0.0001
0 alcohol measures over last 2 weeks, no. (%)	Cohort 1	3 133 (46.4%)	6 745	374 145 (34.0%)	1 099 968	<0.0001
	Cohort 2	3 235 (47.2%)	6 847	374 702 (34.0%)	1 100 536	<0.0001
BMI, mean (SD), kg/m <sup>2</sup>	Cohort 1	26.7 (5.2)	9 852	27.5 (6.0)	1 206 650	<0.0001
	Cohort 2	26.7 (5.2)	10 072	27.5 (6.0)	1 206 437	<0.0001



**Table 3** Table legend: Exposure and outcome sample sizes and reported inverse variance weighted Mendelian randomisation estimates (odds ratio and 95% confidence interval) for the effect of smoking on risk of PD in the present study (23andMe discovery cohort and IPDGC replication cohort), and the two other Mendelian randomisation studies exploring the association between smoking and PD.

PD = Parkinson’s disease; IPDGC = International Parkinson’s disease Genomics

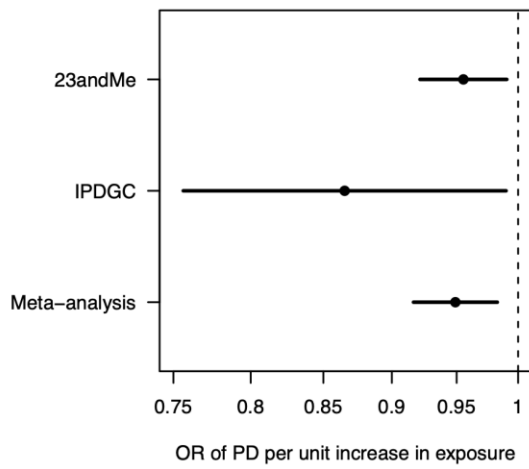
Consortium.

	Smokers	Non-smokers	PD cases	PD proxy cases	Controls	Odds ratio (with 95% confidence interval) for never vs. ever smokers
<b>Grover <i>et al.</i></b>	246,715	271,918	9,581	..	33,245	0.71 (0.57-0.90)
<b>Nalls <i>et al.</i></b>	208,988	244,705	37,688	18,618	1,417,791	0.94 (0.88-1.00)
<b>23andMe discovery cohort</b>	1,067,699	1,457,457	19,924	..	2,413,087	0.96 (0.92-0.99)
<b>IPDGC replication cohort</b>	..	..	15,056	18,618	449,056	0.87 (0.76-0.99)

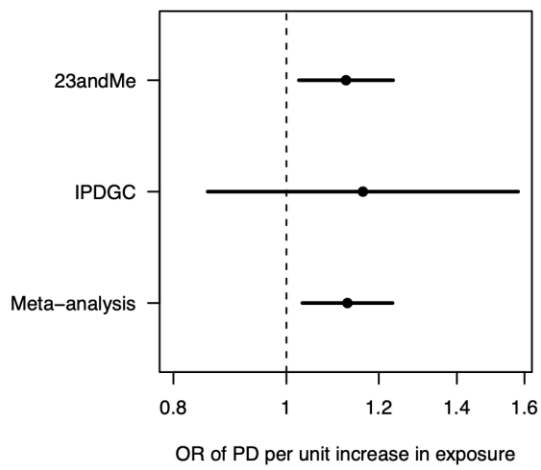
## Figures

Figure 1: Forest plot of Mendelian randomisation causal association estimates between risk of Parkinson's disease and unhealthy behaviours derived from meta-analysis of the 23andMe and IPDGC datasets. The pooled odds ratio (OR), derived from meta-analysis of the inverse variance weighted estimates, and 95% confidence intervals are shown. For smoking, the unit of exposure is never versus ever smoking. For alcohol, the unit of exposure is 1-group difference in daily alcohol intake. For BMI, the unit of exposure is 1 kg/m<sup>2</sup>. OR = odds ratio; PD = Parkinson's disease.

### Tobacco use



### Alcohol consumption



### Body mass index

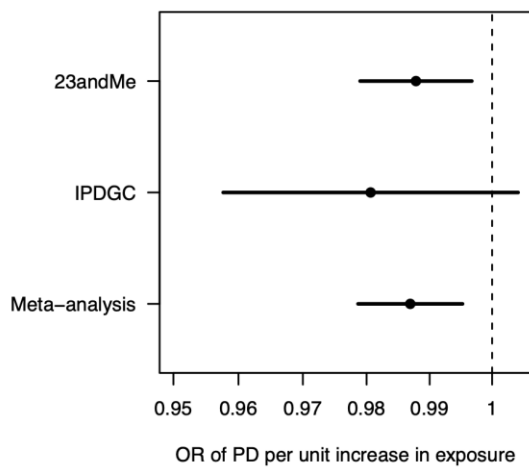


Figure 2: Funnel plots of individual variant effects for the smoking instrument (from cohort 1 (A) and cohort 2 (B)) plotted against the inverse of their standard error.

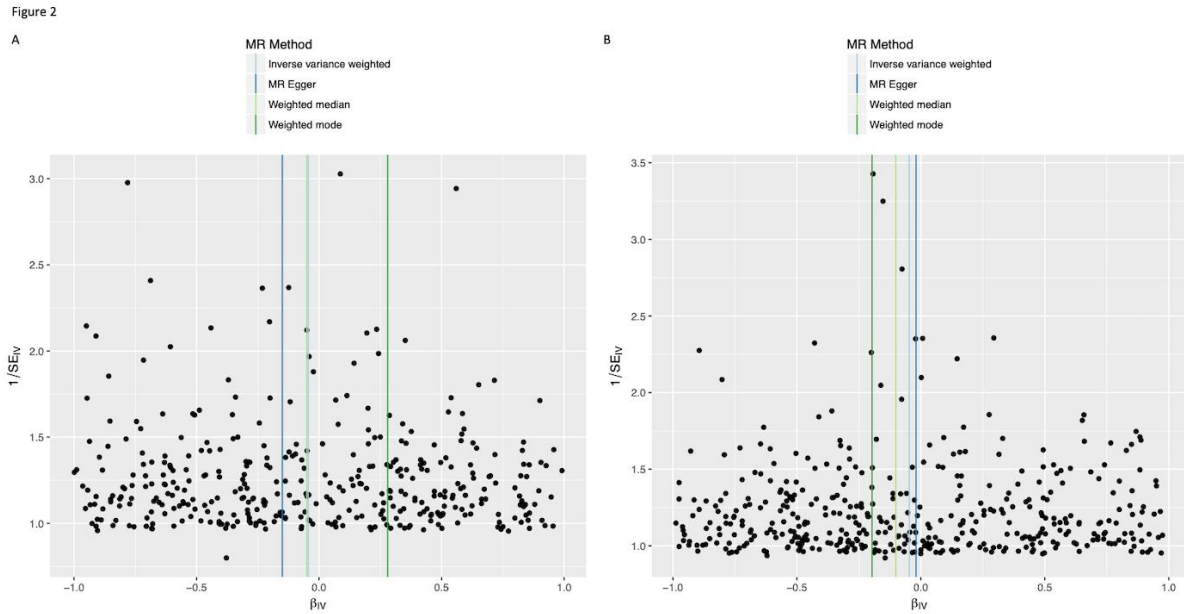


Figure 3: Funnel plots of individual variant effects for the alcohol instrument (from cohort 1 (A) and cohort 2 (B)) plotted against the inverse of their standard error.

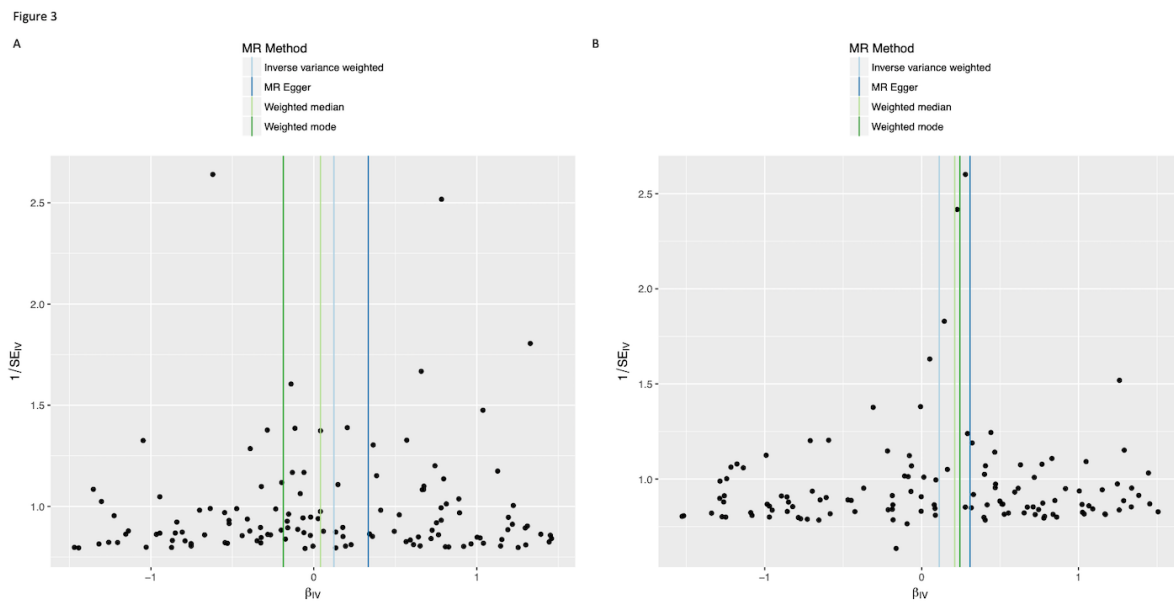
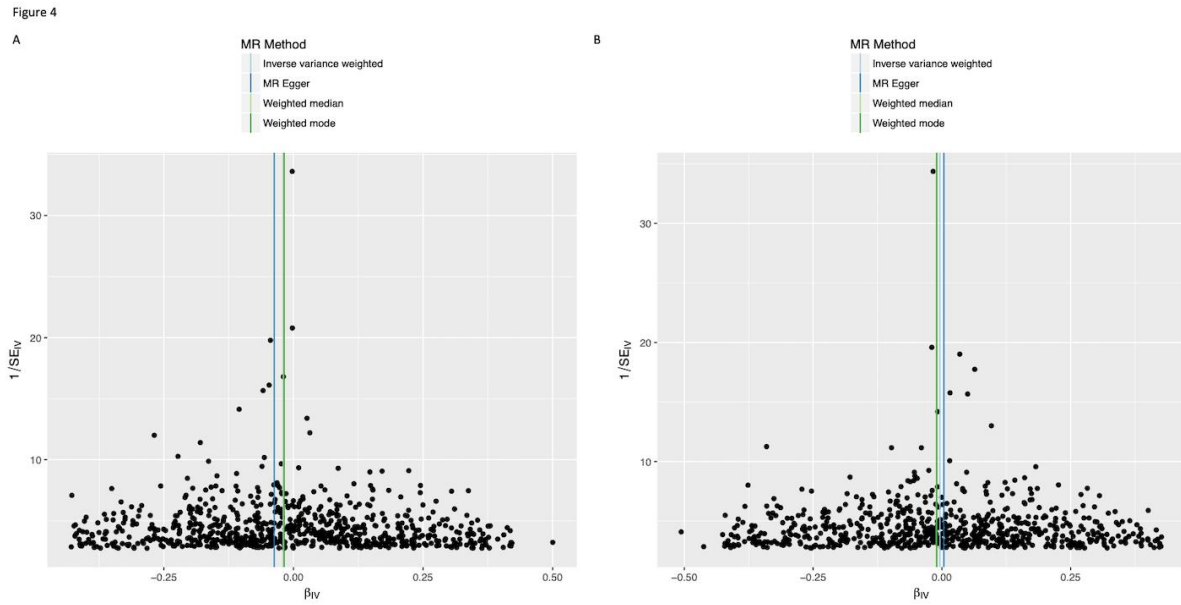


Figure 4: Funnel plots of individual variant effects for the BMI instrument (from cohort 1 (A) and cohort 2 (B)) plotted against the inverse of their standard error.



## Supplementary Data

Table 1

Further detail on the characteristics of MR methods used to pool effect estimates.

Abbreviations: IVW = inverse variance weight; SNP = single nucleotide polymorphism; IV = instrumental variable.

	<b>Practical implications</b>	<b>Assumptions</b>
<b>IVW method</b>	<p>Meta-analyses effect estimates from multiple independent SNPs weighted by inverse variance, that is more precise estimates contribute more to the pooled estimate.</p> <p>Practically, this method gives the same estimate as the slope of a line of best fit constrained to pass through the origin on a scatter plot with the SNP-exposure on the X-axis and SNP-outcome on the Y-axis.</p> <p>This method results in the highest statistical power to detect a causal effect as long as three core IV assumptions are upheld.</p> <p>In theory, a violation of the IV assumptions for 1 or more SNPs in the instrument could render the pooled estimate biased.</p>	<p>Valid as long as the three core IV assumptions are upheld. These are:</p> <ol style="list-style-type: none"><li>1. The SNPs are robustly associated with the exposure.</li><li>2. The SNPs are not associated with confounding factors.</li><li>3. The pathway through which the SNP affects the outcome is only via the exposure and not via an alternative pathway (horizontal pleiotropy). In practice this assumption is often violated and necessitates the use of other methods to explore the pooled causal effect.</li></ol>
<b>MR Egger method</b>	<p>This method relaxes the third IV assumption that there is no directional pleiotropy in one, some, or all of the SNPs in the combined instrument.</p> <p>This method provides a better causal estimate in the presence of directional, horizontal pleiotropy and can be compared to the IVW estimated to determine whether the IVW might be biased.</p> <p>Practically, this method gives the same estimate as the slope of the line of best fit that is not constrained to pass through the origin on a SNP-exposure / SNP-outcome scatter plot. The Y intercept of the line can be tested to see if it is different to 0 (the origin). This has much less statistical power than the IVW.</p>	<p>Relaxation of the third IV assumption, results in the introduction of a new assumption called Instrument Strength Independent of Direct Effect (InSIDE).[53]</p> <p>This assumption allows there to be horizontal pleiotropy as long as the combined pleiotropic effects of SNPs are not correlated with their effects on the exposure.</p>
<b>Weight median method</b>	<p>The above two methods pool effect estimates based on the mean effect and provide combined effect estimates</p>	<p>The assumption here is that up to 50% of SNPs in the combined instrument may be invalid, but no more than 50%.</p>

which assume that either 0% SNPs (IVW) or up to 100% of them (MR Egger) violate core IV assumptions. The weight median method yields the median estimate of all the SNPs in the instrument. Again, this method has less statistical power than the IVW.

**Table 2**

Table legend: SNPs associated with smoking status (cohort 1). 568 SNPs associated with self-reported smoking status, 183 of which were removed by Steiger filtering. The effect of the SNPs on smoking (the exposure) and Parkinson's disease (the outcome) is shown.

Abbreviations: Chr = chromosome; BP = position in base pairs; EA = effect allele; OA = other allele; EAF = effect allele frequency; Beta = per-allele log-odds ratio of being an ever-smoker; SE = standard error.

<b>Chr</b>	<b>BP</b>	<b>EA</b>	<b>OA</b>	<b>EAF</b>	<b>Beta (exposure)</b>	<b>SE (exposure)</b>	<b>Beta (outcome)</b>	<b>SE (outcome)</b>
chr1	3073987	A	G	0.75	0.019	0.0032	-0.012	0.018
chr1	21312022	A	G	0.38	0.02	0.0027	-0.02	0.0156
chr1	27303884	T	C	0.4	-0.016	0.0027	-0.004	0.0154
chr1	31159783	T	C	0.71	0.018	0.0029	-0.003	0.0165
chr1	35040446	G	A	0.4	-0.015	0.0027	0.006	0.0153
chr1	38805810	T	G	0.93	-0.032	0.0052	0.014	0.0297
chr1	39719181	A	G	0.47	-0.017	0.003	0.007	0.0167
chr1	41104664	G	A	0.52	-0.014	0.0026	-0.011	0.0148
chr1	41764463	G	A	0.33	-0.022	0.0028	-0.009	0.0161
chr1	44015809	T	C	0.36	-0.037	0.0027	0.008	0.0155
chr1	66413965	T	A	0.73	0.025	0.0029	0.008	0.0167
chr1	73891352	A	G	0.59	-0.032	0.0027	0.014	0.0151
chr1	76641207	A	G	0.78	-0.02	0.0033	-0.008	0.0185
chr1	80864845	T	C	0.63	-0.016	0.0027	0.001	0.0154
chr1	84237074	G	C	0.15	-0.023	0.0037	0.019	0.0208
chr1	97828604	T	C	0.7	0.02	0.0029	0.012	0.0163
chr1	150354276	G	A	0.63	0.015	0.0028	-0.013	0.0155
chr1	151603336	T	C	0.49	0.015	0.0026	0.001	0.0148
chr1	163781694	A	G	0.71	-0.023	0.003	0.014	0.0174
chr1	164529120	G	A	0.78	-0.027	0.004	0.009	0.0224
chr1	169850666	T	A	0.55	-0.017	0.0026	0.011	0.015
chr1	177887018	T	C	0.78	-0.02	0.0032	0.009	0.0181
chr1	188274341	G	A	0.66	-0.017	0.0028	-0.006	0.0157
chr1	191120902	C	A	0.76	-0.026	0.0031	-0.009	0.0177
chr1	197863414	T	A	0.38	-0.018	0.0027	-0.006	0.0153
chr1	208710593	G	A	0.57	-0.021	0.0026	-0.003	0.015
chr1	214493549	T	C	0.67	-0.023	0.0028	-0.011	0.0159
chr1	216837027	G	A	0.48	0.02	0.0026	0.006	0.0149
chr1	224846994	G	A	0.04	0.049	0.0071	0.008	0.04
chr1	236842077	G	C	0.53	0.019	0.0026	0	0.0149
chr2	624205	T	G	0.18	-0.036	0.0034	0.001	0.0194
chr2	22590100	G	A	0.64	-0.018	0.0028	0.014	0.0157
chr2	25331172	G	A	0.46	-0.015	0.0026	0.01	0.015
chr2	28184766	T	A	0.49	-0.015	0.0026	0.006	0.0149
chr2	40665795	G	C	0.25	-0.021	0.003	0.016	0.0172
chr2	45159091	G	A	0.44	-0.036	0.0027	0.025	0.015



chr2	48131936	T	C	0.74	-0.026	0.0031	0.009	0.0173
chr2	50111641	A	G	0.17	-0.024	0.0036	0.019	0.02
chr2	51370461	T	G	0.39	0.018	0.0027	0.002	0.0151
chr2	55324437	A	G	0.37	-0.02	0.0029	0.012	0.0164
chr2	63353041	G	A	0.64	-0.022	0.0028	0.011	0.0157
chr2	74334462	G	A	0.46	-0.022	0.0028	0.019	0.0153
chr2	78818702	G	A	0.67	-0.018	0.0028	0.004	0.0158
chr2	81783053	G	C	0.24	0.017	0.0031	0	0.0175
chr2	100649165	G	A	0.86	0.03	0.0039	-0.004	0.0221
chr2	104090213	T	C	0.52	0.035	0.0026	-0.004	0.0149
chr2	113234316	T	C	0.28	0.03	0.003	0.02	0.0167
chr2	137537312	G	A	0.36	-0.019	0.0027	0.014	0.0154
chr2	146119018	G	A	0.54	-0.045	0.0026	-0.004	0.0149
chr2	152874230	C	A	0.57	0.02	0.0027	0.019	0.0151
chr2	155669451	T	C	0.45	-0.024	0.0027	0.012	0.015
chr2	159282635	A	G	0.18	0.024	0.0037	0.001	0.0208
chr2	161905001	T	C	0.62	-0.024	0.0027	-0.009	0.0155
chr2	164901363	T	C	0.77	-0.019	0.0031	-0.01	0.0176
chr2	166160512	G	A	0.68	-0.018	0.0028	-0.012	0.0158
chr2	175223701	T	C	0.06	0.034	0.0055	0.029	0.031
chr2	178565913	T	C	0.96	0.055	0.0066	-0.018	0.0367
chr2	200273376	G	A	0.43	-0.017	0.0026	0	0.015
chr2	204121063	G	C	0.14	-0.03	0.0039	0.027	0.0217
chr2	213876511	A	G	0.27	0.018	0.0029	0.006	0.0166
chr2	222499263	T	C	0.25	-0.02	0.0031	0.003	0.0173
chr2	225457266	A	G	0.65	0.022	0.0028	-0.006	0.016
chr2	226336693	A	G	0.72	0.029	0.0029	-0.006	0.0165
chr3	2356040	T	A	0.83	-0.02	0.0035	0.011	0.0197
chr3	16856682	T	C	0.62	-0.019	0.0027	0.006	0.0155
chr3	20754619	G	A	0.25	-0.022	0.0033	-0.018	0.0191
chr3	25159062	G	A	0.52	-0.022	0.0026	-0.018	0.0148
chr3	50187596	G	C	0.65	-0.027	0.0028	-0.015	0.0157
chr3	52855229	T	C	0.73	-0.019	0.0029	-0.012	0.0167
chr3	59966156	T	C	0.43	-0.016	0.0026	-0.014	0.015
chr3	62450760	G	A	0.33	0.018	0.0029	-0.002	0.0161
chr3	67672766	G	A	0.42	0.016	0.0027	-0.005	0.015
chr3	78277185	G	C	0.4	-0.015	0.0027	0.004	0.0153
chr3	80989206	A	G	0.26	-0.022	0.0032	0.016	0.0185
chr3	82714382	A	G	0.77	0.026	0.0031	0	0.0178
chr3	85699040	G	C	0.35	-0.02	0.0027	-0.02	0.0156
chr3	88179767	A	G	0.82	0.025	0.0035	0.004	0.0201
chr3	94229614	A	G	0.36	-0.022	0.0029	0.006	0.0163
chr3	105084349	A	G	0.2	-0.019	0.0034	-0.007	0.0193

chr3	107819041	G	A	0.55	0.017	0.0027	0.007	0.0151
chr3	110211414	T	C	0.37	0.021	0.0027	0.006	0.0154
chr3	114149036	G	A	0.75	0.021	0.003	-0.011	0.017
chr3	115324352	G	A	0.72	0.021	0.0032	-0.011	0.0173
chr3	117637295	G	A	0.83	0.034	0.0035	-0.012	0.0195
chr3	122680330	G	A	0.53	-0.016	0.0026	-0.008	0.015
chr3	135468347	T	C	0.91	0.027	0.0046	-0.009	0.0263
chr3	147106319	T	C	0.21	-0.023	0.0032	-0.008	0.0183
chr3	149685233	G	C	0.41	-0.017	0.0027	0.001	0.0151
chr3	157837621	A	G	0.52	0.023	0.0027	-0.01	0.0155
chr3	161773508	T	A	0.81	-0.022	0.0033	0.018	0.019
chr3	171663383	G	A	0.54	-0.015	0.0026	-0.001	0.0151
chr3	173072584	T	C	0.44	-0.017	0.0028	0.009	0.0157
chr3	175698300	G	A	0.73	-0.025	0.0029	-0.015	0.0168
chr3	180775134	T	C	0.64	0.019	0.0027	-0.005	0.0155
chr3	184082049	T	G	0.53	-0.02	0.0027	0.001	0.0151
chr3	196168047	G	A	0.39	0.016	0.0027	0.012	0.0155
chr4	5228210	G	A	0.33	-0.022	0.0028	0.012	0.0159
chr4	10045827	G	A	0.54	-0.017	0.0026	-0.014	0.0149
chr4	14267184	G	A	0.21	-0.019	0.0032	-0.015	0.0181
chr4	15464905	A	G	0.42	-0.016	0.0027	0.002	0.0153
chr4	16888224	T	C	0.68	0.016	0.0028	0.012	0.0161
chr4	20585883	T	C	0.23	0.018	0.0031	-0.016	0.0179
chr4	21945580	A	G	0.54	0.016	0.0027	-0.003	0.0155
chr4	27974059	G	A	0.33	0.024	0.0028	-0.019	0.0159
chr4	31184484	G	A	0.65	0.029	0.0028	0.021	0.0157
chr4	35434665	T	G	0.4	0.026	0.0027	-0.003	0.0154
chr4	44205340	T	C	0.6	-0.017	0.0027	-0.001	0.0152
chr4	47003829	T	G	0.39	0.018	0.0027	0.016	0.0152
chr4	57767822	G	A	0.59	-0.017	0.0027	-0.016	0.0151
chr4	63132622	A	G	0.71	-0.016	0.0029	0.014	0.0166
chr4	64950979	T	C	0.37	-0.015	0.0027	0.005	0.0154
chr4	67090313	T	G	0.63	-0.018	0.0028	0.009	0.0156
chr4	67821500	G	A	0.22	0.031	0.0032	0.002	0.018
chr4	94543233	T	C	0.28	0.019	0.0029	0.005	0.0165
chr4	97972728	A	G	0.83	0.02	0.0036	-0.008	0.0206
chr4	105251348	G	A	0.52	0.015	0.0026	-0.01	0.015
chr4	112422145	G	A	0.84	0.024	0.0037	0.012	0.0208
chr4	121585939	G	A	0.67	0.015	0.0028	-0.003	0.016
chr4	124479559	T	C	0.16	-0.022	0.0036	0.013	0.0202
chr4	130185974	T	C	0.33	-0.016	0.0028	-0.012	0.0159
chr4	139852596	T	C	0.73	-0.02	0.003	0.017	0.0173
chr4	143487451	T	G	0.12	-0.031	0.0041	-0.013	0.0231

chr4	147919278	T	A	0.72	0.036	0.0029	-0.007	0.0164
chr4	173323412	T	C	0.49	-0.016	0.0026	0.005	0.0149
chr4	176757862	A	G	0.65	0.017	0.0028	0.01	0.0156
chr4	178491013	T	C	0.89	0.025	0.0044	-0.001	0.0246
chr4	183527484	T	C	0.38	-0.021	0.0028	-0.013	0.0156
chr5	12197455	A	G	0.48	-0.025	0.0026	-0.014	0.0151
chr5	19932686	T	C	0.61	-0.018	0.0028	-0.005	0.0155
chr5	30843788	T	A	0.44	-0.022	0.0026	-0.005	0.015
chr5	45282808	C	A	0.19	-0.026	0.0034	-0.014	0.0189
chr5	50794221	T	C	0.65	0.022	0.0027	-0.009	0.0155
chr5	79292899	G	A	0.45	-0.017	0.0026	0.015	0.015
chr5	92312058	T	C	0.36	-0.02	0.0027	-0.009	0.0155
chr5	95747964	A	G	0.71	-0.017	0.0029	-0.008	0.0165
chr5	103781963	G	A	0.17	-0.023	0.0034	-0.011	0.0197
chr5	106455988	C	A	0.42	-0.022	0.0027	-0.004	0.0151
chr5	123848132	G	A	0.56	0.017	0.0027	-0.001	0.0152
chr5	133856358	A	G	0.57	0.022	0.0027	0.014	0.0151
chr5	153545587	G	C	0.52	0.016	0.0026	0.007	0.0149
chr5	154772692	A	G	0.2	0.019	0.0034	0.018	0.019
chr5	160890324	A	G	0.79	0.027	0.0032	0.016	0.0183
chr5	163074552	G	A	0.5	0.021	0.0027	-0.002	0.015
chr5	170516570	T	C	0.3	-0.023	0.0029	0.017	0.0166
chr6	13077424	A	G	0.18	0.029	0.0038	-0.006	0.0216
chr6	15458212	T	C	0.1	0.029	0.0045	-0.013	0.0256
chr6	37486080	T	A	0.53	-0.02	0.0026	-0.004	0.015
chr6	41792545	T	C	0.26	-0.019	0.003	0.012	0.0169
chr6	54750488	T	C	0.41	-0.016	0.0027	0.011	0.0151
chr6	64985692	T	A	0.38	0.015	0.0027	-0.004	0.0154
chr6	67524050	A	G	0.62	-0.026	0.0027	-0.005	0.0153
chr6	84279922	T	G	0.43	0.017	0.0027	0.005	0.0151
chr6	86364200	A	G	0.7	0.017	0.003	0.014	0.0171
chr6	88235329	T	C	0.08	0.031	0.0048	-0.024	0.0282
chr6	92244055	G	A	0.58	-0.02	0.0027	-0.004	0.0151
chr6	94206244	T	C	0.41	0.017	0.0027	-0.005	0.0152
chr6	96501439	G	A	0.45	0.018	0.0027	0.012	0.0152
chr6	101406289	T	C	0.28	0.026	0.0029	-0.022	0.0165
chr6	105147784	G	A	0.9	0.036	0.0047	0.011	0.0268
chr6	111712022	T	A	0.16	0.043	0.0036	0.01	0.0203
chr6	124206716	G	A	0.82	0.025	0.0034	-0.012	0.0193
chr6	144964931	A	G	0.52	-0.015	0.0027	0.01	0.0153
chr6	153375888	T	C	0.71	-0.019	0.0029	0.008	0.0166
chr6	155996888	T	C	0.61	0.016	0.0027	-0.011	0.0152
chr6	157178031	G	A	0.68	0.018	0.0028	0.008	0.016

chr6	163861903	A	G	0.25	-0.024	0.0031	0.007	0.0174
chr6	166383562	T	C	0.63	0.017	0.0027	-0.015	0.0155
chr7	1876199	T	C	0.42	0.032	0.0026	0.006	0.015
chr7	3503207	G	C	0.51	0.031	0.0026	0.011	0.0148
chr7	5269686	G	C	0.88	-0.024	0.0044	-0.018	0.0248
chr7	6758938	T	C	0.54	-0.017	0.003	0.008	0.0169
chr7	8814052	A	G	0.67	0.019	0.0028	0.011	0.0161
chr7	21804225	T	C	0.69	-0.018	0.0028	-0.015	0.016
chr7	37063202	T	C	0.18	0.02	0.0035	-0.011	0.0196
chr7	67094983	G	C	0.16	0.02	0.0036	0.019	0.0205
chr7	69667883	G	A	0.3	-0.027	0.0029	-0.014	0.0163
chr7	75173180	G	A	0.58	0.018	0.0026	-0.006	0.015
chr7	77738475	G	A	0.82	0.026	0.0034	0.013	0.0193
chr7	81734933	T	G	0.53	-0.016	0.0026	-0.005	0.0149
chr7	91248216	G	C	0.11	-0.028	0.0044	-0.004	0.0249
chr7	97773812	C	A	0.45	0.02	0.0026	-0.019	0.0149
chr7	99023246	G	C	0.16	-0.036	0.0037	-0.004	0.0207
chr7	106816476	A	G	0.54	0.017	0.0027	-0.005	0.0151
chr7	109978827	A	G	0.53	0.017	0.0029	-0.004	0.0165
chr7	110950288	A	G	0.51	-0.021	0.0027	0.002	0.0152
chr7	114944919	C	A	0.32	0.032	0.0028	-0.02	0.0159
chr7	117523709	G	A	0.52	0.029	0.0026	-0.001	0.0149
chr7	126378758	G	C	0.57	0.019	0.0027	0.013	0.0152
chr7	127722843	G	A	0.03	-0.044	0.0078	0.037	0.0435
chr7	130857265	A	G	0.9	-0.029	0.0045	0.008	0.0257
chr7	133821619	G	A	0.6	-0.024	0.0027	0.006	0.0153
chr7	158121243	G	A	0.4	-0.015	0.0027	0.01	0.0153
chr8	1085660	T	C	0.66	0.016	0.0028	0.006	0.016
chr8	4117538	T	C	0.28	0.019	0.0029	0.001	0.0165
chr8	10736552	G	C	0.63	-0.025	0.0029	-0.006	0.0164
chr8	12667804	G	C	0.82	-0.025	0.0035	-0.01	0.0199
chr8	21820813	C	A	0.58	0.019	0.0026	0.016	0.015
chr8	27389456	T	C	0.06	-0.094	0.0056	-0.052	0.0319
chr8	37223390	G	A	0.33	-0.018	0.0028	-0.01	0.016
chr8	42457590	T	G	0.42	0.017	0.0027	0.007	0.0153
chr8	51026482	A	G	0.77	-0.021	0.0031	-0.002	0.0177
chr8	52553983	C	A	0.26	0.019	0.003	-0.016	0.017
chr8	57433941	G	A	0.46	0.015	0.0026	0.012	0.0148
chr8	59833644	A	G	0.61	0.016	0.0027	-0.006	0.0151
chr8	66508966	A	G	0.39	0.024	0.0028	0.014	0.0157
chr8	73439070	G	A	0.74	0.018	0.003	0.002	0.0169
chr8	115449148	T	C	0.46	0.017	0.0026	0.008	0.015
chr8	118883651	C	A	0.92	-0.035	0.0048	0.023	0.0277

chr8	133749028	G	A	0.66	0.018	0.0028	0.009	0.0157
chr9	3160657	G	C	0.47	-0.032	0.0026	0.002	0.015
chr9	3877252	T	A	0.8	-0.025	0.0042	0.009	0.0313
chr9	6448171	C	A	0.95	-0.035	0.006	-0.03	0.0344
chr9	7213187	T	C	0.23	-0.02	0.0031	0.004	0.0177
chr9	14453076	C	A	0.74	0.021	0.0031	-0.012	0.0171
chr9	16102759	C	A	0.17	-0.024	0.0035	-0.014	0.0198
chr9	27839795	G	A	0.69	-0.021	0.0029	0.016	0.0163
chr9	29436793	T	C	0.09	-0.029	0.0045	-0.008	0.0256
chr9	32107162	G	C	0.21	0.021	0.0032	0.012	0.0185
chr9	37039669	A	G	0.27	0.018	0.0031	0.003	0.0176
chr9	81472280	G	C	0.43	-0.017	0.0027	0.015	0.015
chr9	86715566	T	C	0.46	-0.014	0.0026	-0.011	0.015
chr9	91253450	G	C	0.45	-0.018	0.0026	-0.003	0.015
chr9	95996573	G	A	0.36	-0.015	0.0027	-0.001	0.0155
chr9	98283093	T	C	0.36	0.019	0.0027	-0.003	0.0156
chr9	101053807	G	A	0.18	0.019	0.0034	-0.001	0.0195
chr9	102088185	G	A	0.53	0.022	0.0026	-0.013	0.0149
chr9	111705501	C	A	0.36	-0.016	0.0027	-0.005	0.0155
chr9	120703219	A	G	0.6	-0.017	0.0027	0.016	0.0155
chr9	122701235	T	C	0.76	0.017	0.0031	0.005	0.0176
chr9	128115198	T	C	0.2	-0.024	0.0033	-0.015	0.0188
chr9	134315287	C	A	0.1	0.027	0.0044	0.017	0.0249
chr9	137970849	C	A	0.78	-0.019	0.0031	-0.003	0.018
chr10	10028972	T	G	0.52	0.02	0.0026	-0.004	0.0148
chr10	22128837	T	C	0.29	0.03	0.0029	-0.011	0.0164
chr10	34490737	T	C	0.22	-0.018	0.0032	0.017	0.0179
chr10	36581771	C	A	0.58	-0.024	0.0027	-0.008	0.0151
chr10	53783503	G	A	0.74	0.018	0.003	0.015	0.0169
chr10	63666637	G	A	0.52	0.026	0.0026	-0.024	0.0149
chr10	68522925	G	C	0.8	-0.023	0.0033	0.022	0.0188
chr10	69985175	A	G	0.18	0.02	0.0035	0.001	0.0197
chr10	87320179	A	G	0.17	0.021	0.0036	-0.01	0.0203
chr10	93713758	T	G	0.65	0.021	0.0027	0.009	0.0155
chr10	104639652	A	G	0.73	-0.033	0.0029	0.024	0.0169
chr10	106454672	T	C	0.58	0.025	0.0027	-0.012	0.0154
chr10	115378364	T	C	0.72	0.026	0.003	-0.019	0.0168
chr10	118890008	A	G	0.84	-0.035	0.0037	-0.032	0.0206
chr10	125680419	G	C	0.65	-0.022	0.0029	0.007	0.0168
chr10	134966154	G	A	0.24	0.018	0.0031	0.009	0.0175
chr11	16837788	G	A	0.85	0.022	0.0037	-0.002	0.021
chr11	18300965	T	G	0.48	-0.015	0.0027	-0.004	0.0151
chr11	27677586	T	G	0.21	-0.039	0.0032	0.037	0.0181

chr11	40545629	G	A	0.39	-0.018	0.0027	0.011	0.0152
chr11	41543427	G	A	0.66	0.021	0.0028	0.007	0.0158
chr11	43700529	T	C	0.36	0.016	0.0028	0.01	0.0157
chr11	92971874	T	C	0.51	-0.015	0.0026	0.013	0.0149
chr11	105741274	A	G	0.5	0.018	0.0027	-0.005	0.0153
chr11	112898428	T	A	0.4	0.045	0.0027	-0.035	0.0152
chr11	121532277	A	G	0.47	0.02	0.0028	0.014	0.0155
chr11	122897866	A	G	0.59	-0.023	0.0028	0.002	0.0155
chr11	124278652	T	C	0.44	-0.016	0.0028	0.003	0.0155
chr11	126983739	A	G	0.61	0.023	0.0028	0.015	0.0159
chr11	132087710	G	C	0.68	-0.022	0.0028	-0.016	0.016
chr11	133834104	T	C	0.62	0.019	0.0028	0.015	0.0156
chr12	1163896	G	A	0.68	0.016	0.0028	0.008	0.016
chr12	18626208	T	C	0.87	-0.022	0.004	-0.005	0.0226
chr12	22533320	C	A	0.41	-0.022	0.0029	-0.02	0.016
chr12	24197222	A	G	0.43	0.02	0.0026	-0.011	0.015
chr12	27901052	T	C	0.83	0.023	0.0036	-0.005	0.0201
chr12	39044361	G	A	0.87	-0.029	0.0039	-0.025	0.0219
chr12	50165690	T	G	0.87	0.03	0.0044	0.017	0.0245
chr12	68295356	C	A	0.51	0.016	0.0026	0.015	0.0149
chr12	69635983	A	G	0.5	-0.019	0.0027	0.014	0.0151
chr12	73682748	T	C	0.32	0.019	0.0029	-0.017	0.0163
chr12	75455390	T	C	0.32	-0.022	0.0028	0.015	0.016
chr12	84625473	A	G	0.5	-0.016	0.0028	-0.015	0.0162
chr12	92071165	G	A	0.58	-0.015	0.0027	-0.007	0.0151
chr12	97704897	G	A	0.15	-0.022	0.0037	0.003	0.0207
chr12	107713511	G	C	0.49	-0.019	0.0026	0.006	0.0149
chr12	108805346	G	A	0.39	0.016	0.0027	0.004	0.0152
chr12	110185637	T	C	0.04	-0.04	0.007	0.006	0.0392
chr12	111814970	G	A	0.2	-0.028	0.0034	-0.026	0.0193
chr12	114695647	T	G	0.15	-0.02	0.0036	0.008	0.0205
chr12	118405172	G	C	0.28	-0.018	0.0029	0.009	0.0166
chr12	121082469	T	C	0.45	-0.019	0.0026	-0.002	0.0149
chr13	36671202	A	G	0.21	-0.019	0.0032	0.005	0.0183
chr13	38172867	G	A	0.88	0.03	0.004	0.016	0.0227
chr13	55832766	A	G	0.23	0.021	0.0031	0.011	0.0177
chr13	59482389	T	C	0.7	0.023	0.0029	-0.005	0.0162
chr13	66847787	T	G	0.27	-0.019	0.0029	-0.007	0.0166
chr13	69489759	T	A	0.22	0.02	0.0031	-0.011	0.018
chr13	72366052	G	A	0.1	0.029	0.0043	-0.019	0.0251
chr13	79042048	T	A	0.81	-0.02	0.0036	-0.007	0.0204
chr13	80166707	A	G	0.38	-0.019	0.003	0.013	0.0167
chr13	80912101	T	C	0.65	0.017	0.0028	0.008	0.0158

chr13	92000420	A	G	0.78	-0.019	0.0031	-0.005	0.0178
chr13	97278267	A	G	0.17	-0.025	0.0035	0.002	0.0197
chr13	100743392	A	G	0.37	0.024	0.0028	0.005	0.0155
chr13	105124364	G	A	0.46	-0.02	0.0026	-0.006	0.015
chr14	23509194	T	C	0.16	-0.022	0.0038	0.005	0.0213
chr14	33643138	T	C	0.58	-0.019	0.0027	-0.013	0.0151
chr14	40092345	G	A	0.44	0.019	0.0026	0.012	0.015
chr14	48389414	T	C	0.48	-0.016	0.0026	-0.009	0.0149
chr14	49949929	T	C	0.11	0.025	0.0043	0.002	0.0242
chr14	56522970	A	G	0.47	-0.016	0.0029	-0.003	0.0165
chr14	57346950	A	G	0.67	-0.021	0.0029	-0.007	0.0161
chr14	58838701	T	C	0.59	-0.021	0.0027	0.013	0.0152
chr14	73915861	T	C	0.54	-0.017	0.0027	0.005	0.015
chr14	77502798	T	C	0.35	0.021	0.0028	0.003	0.0158
chr14	86099452	G	A	0.6	-0.016	0.0027	0.003	0.0152
chr14	99743113	G	A	0.59	0.019	0.0027	0.016	0.0152
chr14	102704136	T	C	0.07	-0.035	0.0053	0.033	0.0295
chr15	36400342	A	G	0.38	-0.018	0.0027	0.002	0.0155
chr15	37250834	T	C	0.84	0.023	0.0036	-0.005	0.0201
chr15	47679807	G	A	0.21	0.039	0.0032	-0.035	0.0185
chr15	66802208	T	G	0.66	-0.019	0.0028	-0.005	0.0157
chr15	67531036	A	G	0.27	-0.021	0.0031	-0.004	0.0177
chr15	74026255	A	G	0.46	-0.022	0.0027	0.01	0.0152
chr15	78027178	T	C	0.41	-0.022	0.0027	0.021	0.0152
chr15	83893243	T	G	0.22	-0.023	0.0032	0.009	0.0178
chr15	88427589	T	C	0.73	-0.017	0.003	-0.001	0.0169
chr15	91428197	T	C	0.46	-0.021	0.0026	0.001	0.015
chr15	96119880	G	A	0.64	-0.016	0.0028	0.006	0.0156
chr15	97503301	G	A	0.35	0.018	0.0027	0.012	0.0155
chr15	99202875	T	C	0.51	0.019	0.0026	-0.006	0.0148
chr16	3533881	T	C	0.23	0.022	0.0032	-0.014	0.0183
chr16	5805394	C	A	0.73	-0.024	0.003	-0.02	0.0168
chr16	7371458	G	A	0.18	0.023	0.0035	-0.001	0.0198
chr16	15670050	G	A	0.8	-0.022	0.0033	-0.007	0.0188
chr16	25378347	G	A	0.7	0.03	0.0028	-0.025	0.016
chr16	61792281	G	A	0.44	0.02	0.0027	-0.012	0.0151
chr16	65271060	G	C	0.66	0.015	0.0028	0.006	0.0158
chr16	69567411	T	C	0.55	-0.024	0.0026	0.018	0.015
chr16	75679742	A	G	0.93	0.038	0.0052	-0.023	0.029
chr16	76501643	T	C	0.51	-0.017	0.0026	0.011	0.0149
chr17	1995177	T	C	0.54	0.02	0.0027	0.017	0.0151
chr17	5413038	T	C	0.26	0.021	0.003	0.001	0.017
chr17	27311532	G	A	0.13	-0.036	0.0039	0.013	0.0219

chr17	30694301	T	A	0.42	0.017	0.0027	-0.004	0.0156
chr17	31609815	T	C	0.5	0.015	0.0027	-0.011	0.0151
chr17	34054035	A	G	0.17	-0.022	0.0035	-0.018	0.0201
chr17	37689327	A	G	0.73	-0.022	0.003	-0.01	0.0171
chr17	41904360	T	G	0.21	-0.021	0.0034	0.012	0.0189
chr17	46509799	G	A	0.62	-0.017	0.0027	-0.014	0.0152
chr17	50232634	T	A	0.67	-0.031	0.0028	-0.004	0.0158
chr18	31767335	A	G	0.67	0.02	0.0029	-0.014	0.0162
chr18	35154890	G	A	0.17	0.022	0.0035	-0.013	0.0199
chr18	36921851	C	A	0.71	0.022	0.0029	-0.014	0.0163
chr18	39318793	T	A	0.89	0.038	0.0043	0.003	0.0242
chr18	49246461	T	C	0.14	0.021	0.0038	-0.002	0.0216
chr18	53743191	T	C	0.24	-0.028	0.0031	-0.008	0.0174
chr18	77562730	A	G	0.79	-0.024	0.0033	0.01	0.019
chr19	5002011	A	G	0.33	-0.02	0.0028	-0.003	0.016
chr19	32449082	T	C	0.52	0.018	0.0027	-0.001	0.0151
chr19	36872571	A	G	0.55	-0.016	0.0029	0.012	0.0161
chr20	3008775	T	G	0.5	-0.016	0.0026	0.015	0.0148
chr20	16275025	T	G	0.16	0.02	0.0036	-0.005	0.0202
chr20	33766200	A	G	0.48	-0.015	0.0027	0.009	0.0152
chr20	37420050	C	A	0.33	-0.016	0.0028	0.005	0.0157
chr20	39911001	A	G	0.45	0.016	0.0026	0.008	0.015
chr20	41939651	T	C	0.55	0.019	0.0027	-0.009	0.0151
chr20	44781380	T	C	0.22	0.019	0.0031	-0.006	0.0178
chr20	49136908	A	G	0.43	-0.015	0.0027	-0.005	0.0152
chr20	51588847	T	C	0.9	0.028	0.0046	0.013	0.0259
chr20	54454722	C	A	0.19	0.018	0.0033	0.004	0.0188
chr20	60523888	A	G	0.26	-0.023	0.0031	0.017	0.0174
chr20	61988382	G	A	0.19	0.027	0.0034	-0.001	0.0192
chr21	24360725	G	C	0.45	-0.016	0.0027	0.001	0.015
chr21	40663620	T	C	0.43	0.025	0.0027	-0.013	0.0151
chr21	44991159	T	C	0.56	0.015	0.0027	-0.014	0.0151
chr21	46558780	T	C	0.64	-0.021	0.0027	0.004	0.0155
chr22	38260548	A	G	0.39	-0.02	0.0027	0.018	0.0153
chr22	40726762	G	A	0.51	0.015	0.0027	0.009	0.0152
chrx	15293022	G	A	0.46	-0.013	0.0022	-0.005	0.0118
chrx	23174666	T	A	0.68	-0.018	0.0023	0.002	0.0127
chrx	50492754	T	G	0.97	0.111	0.0081	0.027	0.0559
chrx	81723710	G	A	0.23	0.015	0.0026	0.007	0.0141
chrx	87698139	T	C	0.09	0.043	0.0051	0.015	0.0366
chrx	96605165	T	C	0.4	-0.02	0.0022	0.013	0.0121
chrx	98110226	T	C	0.63	-0.015	0.0027	-0.009	0.0141
chrx	120420093	G	C	0.45	0.015	0.0022	-0.009	0.0121



<b>chrX</b>	122434668	T	C	0.26	0.015	0.0024	-0.012	0.0134
<b>chrX</b>	126318714	A	G	0.67	-0.016	0.0023	0.003	0.0126
<b>chrX</b>	135533413	T	C	0.4	0.016	0.0028	0.013	0.0147
<b>chrX</b>	142890526	G	A	0.5	0.015	0.0022	0.005	0.0118
<b>chrX</b>	147253765	T	C	0.95	-0.035	0.006	-0.008	0.032

**Table 3**

Table legend: SNPs associated with smoking status (cohort 2). 577 SNPs associated with self-reported smoking status, 155 of which were removed by Steiger filtering. The effect of the SNPs on smoking (the exposure) and Parkinson's disease (the outcome) is shown.

Abbreviations: Chr = chromosome; BP = position in base pairs; EA = effect allele; OA = other allele; EAF = effect allele frequency; Beta = per-allele log-odds ratio for a 1 standard measure daily increase in alcohol intake; SE = standard error.

<b>Chr</b>	<b>BP</b>	<b>EA</b>	<b>OA</b>	<b>EAF</b>	<b>Beta (exposure)</b>	<b>SE (exposure)</b>	<b>Beta (outcome)</b>	<b>SE (outcome)</b>
chr1	7784688	T	C	0.62	0.019	0.0027	-0.017	0.0027
chr1	18434518	G	C	0.47	0.023	0.0026	0.017	0.0026
chr1	26484721	T	G	0.3	0.018	0.0029	-0.011	0.0029
chr1	32207581	T	G	0.83	-0.023	0.0035	-0.004	0.0035
chr1	33897842	A	G	0.53	0.025	0.0028	0.013	0.0028
chr1	35057999	G	C	0.59	-0.015	0.0026	0	0.0026
chr1	38748653	T	G	0.7	-0.018	0.0029	0.009	0.0029
chr1	41776623	G	A	0.31	-0.025	0.0028	-0.013	0.0028
chr1	44078602	C	A	0.65	0.032	0.0027	-0.005	0.0027
chr1	46432101	C	A	0.42	0.019	0.0027	-0.016	0.0027
chr1	50579237	C	A	0.22	0.033	0.0032	0.009	0.0032
chr1	57680247	T	C	0.52	-0.015	0.0026	0.015	0.0026
chr1	60504658	G	C	0.38	0.017	0.0027	-0.017	0.0027
chr1	66440096	T	C	0.53	0.023	0.0026	-0.007	0.0026
chr1	69735155	G	A	0.6	-0.016	0.0027	0.001	0.0027
chr1	73988149	T	C	0.6	-0.035	0.0027	0.007	0.0027
chr1	79399909	G	A	0.53	-0.015	0.0026	0.007	0.0026
chr1	80864351	G	A	0.59	-0.016	0.0027	0.013	0.0027
chr1	82635178	C	A	0.3	0.018	0.0029	-0.006	0.0029
chr1	84073640	T	C	0.61	-0.019	0.0027	0.007	0.0027
chr1	87831106	T	C	0.31	-0.016	0.0029	0.01	0.0029
chr1	91207757	G	C	0.62	-0.026	0.0027	0.008	0.0027
chr1	97162271	G	A	0.67	-0.023	0.0028	-0.013	0.0028
chr1	150320571	T	C	0.4	-0.02	0.0027	-0.01	0.0027
chr1	154548880	G	A	0.76	0.025	0.0031	0.02	0.0031
chr1	163784410	T	G	0.33	0.016	0.0028	0.01	0.0028
chr1	174210077	A	G	0.54	0.024	0.0026	0.004	0.0026
chr1	176845410	G	C	0.25	0.02	0.003	0.011	0.003
chr1	181740743	G	A	0.25	0.018	0.003	0	0.003
chr1	188484287	C	A	0.67	0.016	0.0028	-0.008	0.0028
chr1	191043122	T	G	0.27	0.018	0.003	-0.017	0.003
chr1	197446702	T	G	0.42	-0.019	0.0026	0.008	0.0026
chr1	204601875	T	C	0.24	-0.017	0.0031	0.008	0.0031
chr1	210423414	G	A	0.71	0.021	0.0029	0.008	0.0029
chr1	214481121	C	A	0.67	-0.021	0.0028	0.006	0.0028
chr1	216908711	A	G	0.22	-0.019	0.0032	0.011	0.0032

chr1	224544746	G	A	0.96	-0.043	0.0077	-0.014	0.0077
chr1	227354535	T	C	0.85	-0.024	0.0037	-0.017	0.0037
chr1	236848268	G	A	0.53	0.018	0.0026	0.005	0.0026
chr1	242253024	T	C	0.64	-0.019	0.0027	0.017	0.0027
chr1	245141141	T	C	0.39	-0.016	0.0027	0.007	0.0027
chr2	620297	G	A	0.85	0.036	0.0037	0.012	0.0037
chr2	2884500	C	A	0.39	-0.016	0.0027	-0.013	0.0027
chr2	4113262	C	A	0.45	-0.015	0.0026	0	0.0026
chr2	8053489	G	A	0.28	0.018	0.0031	0.016	0.0031
chr2	22557528	A	G	0.37	0.02	0.0027	0.01	0.0027
chr2	28404661	T	A	0.28	0.017	0.003	0.002	0.003
chr2	40636031	T	A	0.5	-0.015	0.0026	-0.001	0.0026
chr2	48131936	T	C	0.74	-0.028	0.0031	0.014	0.0031
chr2	57995348	C	A	0.57	-0.016	0.0027	0.008	0.0027
chr2	60496910	T	C	0.43	-0.025	0.0026	-0.021	0.0026
chr2	63224563	G	A	0.69	-0.025	0.0029	-0.002	0.0029
chr2	74334462	G	A	0.46	-0.019	0.0028	-0.009	0.0028
chr2	76287352	G	A	0.22	-0.019	0.0031	-0.009	0.0031
chr2	77881356	C	A	0.21	-0.018	0.0032	-0.009	0.0032
chr2	79440822	G	A	0.36	-0.016	0.0028	-0.007	0.0028
chr2	81076023	T	C	0.49	0.016	0.0026	-0.001	0.0026
chr2	83700224	T	C	0.34	-0.016	0.0029	0.004	0.0029
chr2	86469641	T	C	0.57	-0.015	0.0027	-0.002	0.0027
chr2	101573547	G	A	0.39	-0.018	0.0027	0.004	0.0027
chr2	104447054	T	A	0.51	0.037	0.0027	0	0.0027
chr2	113240183	T	C	0.72	-0.025	0.003	0.016	0.003
chr2	116791796	G	A	0.32	-0.022	0.0029	0.002	0.0029
chr2	122662469	A	G	0.81	0.02	0.0036	-0.015	0.0036
chr2	137617943	G	C	0.77	-0.023	0.0031	0.006	0.0031
chr2	146134326	G	A	0.54	-0.042	0.0026	0.003	0.0026
chr2	152881389	G	C	0.42	-0.017	0.0026	0.005	0.0026
chr2	164906820	T	C	0.23	0.022	0.0031	0.006	0.0031
chr2	171082383	T	G	0.36	0.015	0.0027	-0.006	0.0027
chr2	172842968	A	G	0.28	-0.018	0.0031	-0.004	0.0031
chr2	174048371	G	A	0.62	-0.022	0.0027	0.012	0.0027
chr2	178950266	A	G	0.49	0.018	0.0027	0.009	0.0027
chr2	182048908	A	G	0.35	-0.018	0.0028	-0.014	0.0028
chr2	185097662	A	G	0.47	0.017	0.0031	-0.005	0.0031
chr2	196679977	G	C	0.58	-0.016	0.0026	-0.002	0.0026
chr2	199520404	T	C	0.53	-0.02	0.0026	0.001	0.0026
chr2	204151503	G	A	0.11	-0.04	0.0045	0.032	0.0045
chr2	220049548	A	G	0.68	-0.017	0.0031	0.003	0.0031
chr2	222271785	T	C	0.58	0.019	0.0027	0.018	0.0027

chr2	226332033	G	A	0.2	-0.027	0.0033	0.019	0.0033
chr2	235416674	T	A	0.45	-0.017	0.0027	0.008	0.0027
chr2	237099013	A	G	0.81	-0.027	0.0037	0	0.0037
chr2	237918501	T	C	0.66	0.018	0.0028	-0.013	0.0028
chr3	2365997	T	C	0.82	-0.02	0.0034	-0.002	0.0034
chr3	13094397	T	A	0.39	0.019	0.0027	-0.001	0.0027
chr3	16875823	T	C	0.62	-0.021	0.0028	-0.016	0.0028
chr3	18057313	C	A	0.5	-0.02	0.0026	0.008	0.0026
chr3	20636866	G	A	0.71	0.025	0.0029	0.014	0.0029
chr3	21723547	G	C	0.07	0.03	0.0052	-0.01	0.0052
chr3	24075053	T	C	0.21	-0.018	0.0033	-0.008	0.0033
chr3	25639141	A	G	0.26	-0.03	0.0033	0.009	0.0033
chr3	29789588	C	A	0.4	0.017	0.0027	-0.012	0.0027
chr3	34496646	A	G	0.3	0.018	0.0029	-0.011	0.0029
chr3	43301454	T	C	0.85	-0.024	0.0036	0.014	0.0036
chr3	50187596	G	C	0.65	-0.027	0.0028	-0.018	0.0028
chr3	60438930	A	G	0.67	-0.017	0.0029	0.003	0.0029
chr3	64176107	T	C	0.56	0.017	0.0027	0.01	0.0027
chr3	65518274	G	C	0.15	-0.02	0.0036	-0.008	0.0036
chr3	71063373	G	A	0.53	0.025	0.0027	0.021	0.0027
chr3	74994627	A	G	0.75	-0.024	0.0031	0.013	0.0031
chr3	77313689	T	G	0.26	-0.022	0.003	0.012	0.003
chr3	85428726	T	C	0.46	0.023	0.0027	0.012	0.0027
chr3	88196211	C	A	0.73	0.021	0.003	-0.007	0.003
chr3	94190737	G	A	0.66	0.021	0.0028	-0.019	0.0028
chr3	108708374	G	A	0.63	-0.02	0.0027	0.004	0.0027
chr3	109836400	A	G	0.73	-0.019	0.0032	0.001	0.0032
chr3	117653515	G	C	0.86	0.034	0.0037	0.006	0.0037
chr3	124435888	T	C	0.37	-0.019	0.0028	-0.011	0.0028
chr3	134668580	T	A	0.46	-0.018	0.0026	0.013	0.0026
chr3	155311593	G	A	0.88	0.025	0.0043	0.017	0.0043
chr3	161779956	T	C	0.26	0.021	0.0032	-0.018	0.0032
chr3	171664420	G	A	0.46	0.018	0.0026	-0.005	0.0026
chr3	173353739	T	G	0.15	0.03	0.0037	0.028	0.0037
chr3	174255801	A	G	0.14	-0.022	0.0039	-0.005	0.0039
chr3	191137363	T	A	0.88	-0.023	0.0041	0.017	0.0041
chr4	5213588	T	G	0.33	-0.02	0.0028	0.017	0.0028
chr4	10032516	T	G	0.71	0.02	0.0029	-0.007	0.0029
chr4	34829253	G	A	0.33	-0.016	0.0028	0.003	0.0028
chr4	45075034	T	C	0.54	0.015	0.0026	-0.005	0.0026
chr4	46034067	T	C	0.41	-0.016	0.0027	-0.009	0.0027
chr4	47693816	G	A	0.88	-0.024	0.004	0.019	0.004
chr4	54839552	G	C	0.61	-0.015	0.0027	-0.001	0.0027

chr4	60275954	T	G	0.63	-0.017	0.0027	-0.01	0.0027
chr4	63425844	T	A	0.49	-0.015	0.0026	0.013	0.0026
chr4	79832706	G	C	0.09	-0.028	0.005	-0.005	0.005
chr4	94075844	T	A	0.56	-0.02	0.0026	0.017	0.0026
chr4	97951199	C	A	0.81	0.019	0.0033	0.006	0.0033
chr4	101449000	T	G	0.71	-0.02	0.0029	-0.012	0.0029
chr4	105516366	T	C	0.71	0.017	0.0029	0.017	0.0029
chr4	112406961	T	C	0.16	-0.027	0.0037	0.015	0.0037
chr4	116391971	A	G	0.72	0.018	0.003	-0.01	0.003
chr4	130196566	A	G	0.31	0.02	0.0028	-0.011	0.0028
chr4	136492883	T	C	0.63	-0.016	0.0027	0.004	0.0027
chr4	139832209	C	A	0.46	-0.024	0.0027	0.005	0.0027
chr4	140909431	G	A	0.63	0.029	0.0027	0.019	0.0027
chr4	143489566	T	C	0.14	-0.026	0.0038	-0.007	0.0038
chr4	147892223	A	G	0.71	0.037	0.0029	0.005	0.0029
chr4	149519235	C	A	0.33	-0.015	0.0028	-0.001	0.0028
chr4	170621232	T	C	0.28	-0.017	0.0029	0	0.0029
chr4	173516885	G	C	0.36	-0.018	0.0027	-0.001	0.0027
chr4	176851045	T	A	0.2	0.02	0.0033	-0.017	0.0033
chr4	181491913	C	A	0.67	0.019	0.0028	0.01	0.0028
chr4	183530449	C	A	0.72	0.019	0.0029	-0.003	0.0029
chr5	3233615	A	G	0.55	-0.016	0.0027	-0.007	0.0027
chr5	7783858	T	C	0.59	-0.015	0.0027	-0.014	0.0027
chr5	13046780	T	C	0.54	0.016	0.0027	0.015	0.0027
chr5	22214352	G	A	0.48	0.015	0.0028	0.008	0.0028
chr5	45279858	C	A	0.19	-0.024	0.0033	0.006	0.0033
chr5	60439786	A	G	0.29	0.025	0.0029	0.022	0.0029
chr5	63967155	T	C	0.52	0.015	0.0027	0	0.0027
chr5	79579376	G	C	0.74	0.018	0.0031	0.001	0.0031
chr5	80263403	G	A	0.35	-0.018	0.0027	-0.006	0.0027
chr5	84367473	T	G	0.35	0.017	0.0028	0.012	0.0028
chr5	87685500	T	C	0.48	-0.031	0.0026	0.025	0.0026
chr5	92499034	A	G	0.29	-0.023	0.003	0.005	0.003
chr5	94226925	A	G	0.48	-0.016	0.0026	0.006	0.0026
chr5	96223007	A	G	0.49	0.017	0.0028	0.007	0.0028
chr5	104084492	A	G	0.22	-0.021	0.0032	0.021	0.0032
chr5	107446478	G	A	0.32	-0.029	0.0028	0.012	0.0028
chr5	116976751	G	A	0.1	0.025	0.0044	0.021	0.0044
chr5	133865452	G	A	0.43	-0.025	0.0027	0.008	0.0027
chr5	145237428	C	A	0.81	0.02	0.0035	0.015	0.0035
chr5	145852315	T	C	0.12	0.026	0.0043	0.019	0.0043
chr5	154808486	C	A	0.28	0.018	0.0029	-0.005	0.0029
chr5	157698418	T	C	0.28	0.017	0.0029	-0.009	0.0029

chr5	161018271	T	G	0.43	0.016	0.0026	-0.004	0.0026
chr5	165429898	A	G	0.62	0.015	0.0027	-0.009	0.0027
chr5	169372193	G	C	0.31	-0.017	0.0029	0.008	0.0029
chr5	170547130	T	C	0.69	0.024	0.0028	0.003	0.0028
chr6	15445799	C	A	0.86	-0.021	0.0038	0.01	0.0038
chr6	18986962	G	C	0.7	-0.021	0.0028	0.011	0.0028
chr6	23484583	T	C	0.36	0.018	0.0028	-0.014	0.0028
chr6	37370286	T	C	0.46	0.019	0.0027	0.004	0.0027
chr6	40516220	G	A	0.57	0.015	0.0027	0.005	0.0027
chr6	41901363	A	G	0.29	-0.021	0.003	-0.006	0.003
chr6	67553621	T	C	0.62	-0.021	0.0028	0.002	0.0028
chr6	68665889	G	A	0.68	0.02	0.0028	-0.013	0.0028
chr6	70277040	G	C	0.76	0.019	0.0032	-0.009	0.0032
chr6	84307726	T	C	0.56	-0.015	0.0026	0.004	0.0026
chr6	92226182	A	G	0.58	-0.022	0.0027	0.011	0.0027
chr6	94201628	A	G	0.45	-0.016	0.0028	0.002	0.0028
chr6	98698501	G	A	0.73	-0.03	0.003	-0.026	0.003
chr6	108019951	G	A	0.57	-0.017	0.0026	0.009	0.0026
chr6	124223578	T	A	0.81	0.022	0.0033	0.001	0.0033
chr6	128333682	T	G	0.27	-0.017	0.003	-0.002	0.003
chr6	129353629	G	A	0.31	-0.025	0.0029	0.006	0.0029
chr6	142993151	G	A	0.5	0.018	0.0026	-0.005	0.0026
chr6	145284716	T	C	0.79	-0.019	0.0032	0.006	0.0032
chr6	156008906	T	C	0.42	0.018	0.0027	-0.01	0.0027
chr6	162969924	T	G	0.8	-0.019	0.0032	0	0.0032
chr6	165341545	G	A	0.68	-0.017	0.0028	-0.009	0.0028
chr6	166465918	G	A	0.3	-0.016	0.0028	0.008	0.0028
chr7	3370038	T	C	0.53	0.035	0.0026	-0.001	0.0026
chr7	8848765	T	G	0.83	0.021	0.0035	0.01	0.0035
chr7	11135909	G	A	0.35	0.019	0.0028	0.016	0.0028
chr7	24736295	G	A	0.94	0.033	0.0058	-0.004	0.0058
chr7	28187344	C	A	0.11	-0.025	0.0042	0.009	0.0042
chr7	36864650	C	A	0.43	0.014	0.0026	0	0.0026
chr7	41163721	G	A	0.66	-0.016	0.0028	-0.005	0.0028
chr7	73868694	A	G	0.55	0.018	0.0031	0.017	0.0031
chr7	78312143	T	A	0.93	0.032	0.005	0.022	0.005
chr7	86044121	A	G	0.84	-0.028	0.0041	0.006	0.0041
chr7	87745903	T	A	0.51	0.015	0.0026	0	0.0026
chr7	91268163	G	C	0.89	0.027	0.0044	0.023	0.0044
chr7	96649884	A	G	0.35	-0.023	0.0028	0.016	0.0028
chr7	104885482	A	G	0.62	-0.016	0.0027	-0.004	0.0027
chr7	114962526	G	C	0.43	0.036	0.0027	0.011	0.0027
chr7	120011894	G	A	0.11	-0.033	0.0043	-0.012	0.0043

chr7	121954709	G	A	0.61	-0.021	0.0028	-0.018	0.0028
chr7	126260096	A	G	0.38	-0.02	0.0027	-0.009	0.0027
chr7	127497413	A	G	0.26	0.018	0.0032	0.005	0.0032
chr7	141672705	G	A	0.46	0.016	0.0026	-0.004	0.0026
chr8	12686438	T	G	0.83	-0.022	0.0034	0.015	0.0034
chr8	17895734	G	A	0.72	0.019	0.0029	0.017	0.0029
chr8	27453579	G	A	0.16	-0.069	0.0036	0.013	0.0036
chr8	35319481	G	A	0.09	0.041	0.0073	-0.01	0.0073
chr8	59804351	T	C	0.48	0.018	0.0026	-0.014	0.0026
chr8	66666142	T	G	0.55	-0.015	0.0026	-0.002	0.0026
chr8	87679777	T	A	0.44	0.016	0.0026	-0.011	0.0026
chr8	93204917	A	G	0.33	0.023	0.0028	0.011	0.0028
chr8	105201360	G	A	0.32	0.017	0.0028	0.002	0.0028
chr8	115642408	T	G	0.73	-0.019	0.003	0	0.003
chr8	118863856	A	G	0.81	-0.025	0.0034	-0.009	0.0034
chr8	133685650	T	C	0.57	0.02	0.0027	-0.016	0.0027
chr8	143618781	T	C	0.03	-0.051	0.0081	0.006	0.0081
chr9	3019635	A	G	0.52	-0.022	0.0027	-0.009	0.0027
chr9	11198010	G	C	0.49	0.019	0.0026	-0.013	0.0026
chr9	14453076	C	A	0.74	0.019	0.0031	0.011	0.0031
chr9	23833909	T	C	0.74	0.03	0.003	-0.019	0.003
chr9	27830541	C	A	0.63	-0.02	0.0028	0.005	0.0028
chr9	29772906	T	A	0.61	0.019	0.0027	0.017	0.0027
chr9	76660645	T	C	0.64	0.016	0.0028	0.013	0.0028
chr9	81537609	C	A	0.38	-0.021	0.0027	0.007	0.0027
chr9	84743437	G	A	0.41	0.015	0.0026	0	0.0026
chr9	86715566	T	C	0.46	-0.019	0.0026	0.01	0.0026
chr9	91786150	A	G	0.35	0.016	0.0028	-0.008	0.0028
chr9	102080474	T	C	0.5	0.018	0.0026	-0.003	0.0026
chr9	109330970	A	G	0.65	0.017	0.0028	-0.002	0.0028
chr9	119839328	T	C	0.88	0.024	0.0041	0.001	0.0041
chr9	120634674	T	C	0.58	0.021	0.0026	0.006	0.0026
chr9	122114097	A	G	0.56	0.018	0.0027	0.004	0.0027
chr9	132022478	T	C	0.22	0.018	0.0031	0.001	0.0031
chr9	134907263	T	G	0.3	0.022	0.0029	-0.008	0.0029
chr10	233380	T	C	0.94	0.031	0.0056	-0.01	0.0056
chr10	953273	T	C	0.17	-0.024	0.0036	-0.017	0.0036
chr10	2098357	G	A	0.3	0.017	0.0028	-0.012	0.0028
chr10	4092691	A	G	0.96	-0.051	0.007	-0.008	0.007
chr10	8838161	C	A	0.25	0.021	0.003	0.007	0.003
chr10	10011659	A	G	0.47	-0.017	0.0026	0.008	0.0026
chr10	30304918	T	C	0.37	-0.017	0.0027	-0.007	0.0027
chr10	31286821	T	C	0.58	0.016	0.0027	0.014	0.0027

chr10	36530934	T	C	0.48	0.016	0.0026	0.006	0.0026
chr10	53761364	T	G	0.4	-0.016	0.0027	-0.012	0.0027
chr10	76838113	T	G	0.27	0.016	0.003	0.015	0.003
chr10	86772946	A	G	0.33	0.017	0.003	-0.008	0.003
chr10	94153814	T	C	0.55	0.021	0.0027	-0.012	0.0027
chr10	101636163	G	C	0.49	-0.015	0.0027	-0.01	0.0027
chr10	104876344	A	G	0.3	0.038	0.0029	-0.034	0.0029
chr10	106563924	T	C	0.2	-0.028	0.0033	-0.019	0.0033
chr10	109041430	G	A	0.62	-0.024	0.0027	0	0.0027
chr10	115375528	C	A	0.73	0.031	0.003	0.02	0.003
chr10	125680419	G	C	0.65	-0.024	0.0029	-0.004	0.0029
chr10	131683760	C	A	0.64	-0.017	0.003	0.011	0.003
chr10	134938590	G	A	0.74	-0.018	0.0033	-0.01	0.0033
chr11	15720177	T	A	0.53	0.018	0.0026	-0.013	0.0026
chr11	20200744	G	A	0.47	-0.016	0.0026	0.008	0.0026
chr11	24595549	G	A	0.62	0.018	0.0027	-0.014	0.0027
chr11	27679916	T	C	0.19	-0.044	0.0033	0.019	0.0033
chr11	38788615	T	C	0.41	-0.017	0.0027	-0.014	0.0027
chr11	42434643	A	G	0.44	0.023	0.0027	0.014	0.0027
chr11	56236684	A	G	0.32	-0.019	0.0028	0.004	0.0028
chr11	86116828	A	G	0.5	-0.015	0.0027	0.014	0.0027
chr11	104502096	T	A	0.6	0.015	0.0027	-0.011	0.0027
chr11	105732165	G	C	0.49	0.019	0.0027	0.016	0.0027
chr11	112851068	G	C	0.4	0.05	0.0027	-0.008	0.0027
chr11	120618079	T	C	0.6	0.016	0.0027	-0.015	0.0027
chr11	121521844	T	C	0.48	0.02	0.0027	-0.011	0.0027
chr11	124609568	A	G	0.93	0.031	0.005	-0.005	0.005
chr11	126896977	T	C	0.29	0.017	0.0029	0.013	0.0029
chr11	132044587	T	G	0.53	-0.018	0.0026	0.009	0.0026
chr12	11918958	T	C	0.2	-0.02	0.0034	0.002	0.0034
chr12	19295169	G	A	0.19	-0.022	0.0033	0.002	0.0033
chr12	22771942	G	C	0.58	0.02	0.0027	-0.01	0.0027
chr12	24737062	C	A	0.88	0.026	0.004	-0.001	0.004
chr12	26111923	G	A	0.84	-0.02	0.0036	0.015	0.0036
chr12	29944159	T	C	0.25	0.017	0.0031	-0.001	0.0031
chr12	31700912	T	C	0.73	0.019	0.003	-0.013	0.003
chr12	49950408	G	A	0.93	0.038	0.0051	-0.03	0.0051
chr12	57993490	G	A	0.23	0.018	0.0031	-0.015	0.0031
chr12	62480461	T	A	0.37	0.017	0.0027	-0.001	0.0027
chr12	68306823	A	G	0.51	0.017	0.0026	0.003	0.0026
chr12	72703554	T	C	0.46	-0.015	0.0027	-0.013	0.0027
chr12	75504066	T	C	0.85	0.024	0.0037	0.013	0.0037
chr12	84765117	T	C	0.24	0.018	0.0031	0.01	0.0031



chr12	87888210	G	A	0.72	-0.019	0.0031	0.01	0.0031
chr12	89745477	C	A	0.47	0.017	0.0026	0.011	0.0026
chr12	98631059	G	A	0.59	-0.018	0.0027	-0.013	0.0027
chr12	107901343	T	C	0.77	0.019	0.0031	-0.006	0.0031
chr12	108747262	T	C	0.71	0.017	0.0029	0.013	0.0029
chr12	117478768	A	G	0.66	0.015	0.0028	-0.002	0.0028
chr12	119181614	T	C	0.22	-0.017	0.0031	0.003	0.0031
chr12	121084654	C	A	0.56	0.024	0.0026	-0.007	0.0026
chr12	125791339	G	A	0.35	0.02	0.0031	-0.009	0.0031
chr13	31433847	T	C	0.69	0.016	0.0029	0.01	0.0029
chr13	38149073	T	C	0.13	-0.035	0.004	-0.017	0.004
chr13	55853324	G	A	0.79	0.028	0.0032	-0.012	0.0032
chr13	57228579	A	G	0.92	-0.027	0.0049	0.001	0.0049
chr13	59455970	G	C	0.7	0.027	0.0029	-0.018	0.0029
chr13	64953502	T	A	0.47	-0.015	0.0027	-0.014	0.0027
chr13	66940097	T	A	0.5	0.026	0.0026	0.002	0.0026
chr13	79000138	T	A	0.43	0.015	0.0027	-0.008	0.0027
chr13	80168720	G	C	0.49	-0.023	0.0026	-0.009	0.0026
chr13	80918117	T	G	0.72	0.019	0.003	-0.004	0.003
chr13	82636238	A	G	0.48	-0.019	0.0033	0.009	0.0033
chr13	90376153	C	A	0.41	0.016	0.0027	-0.008	0.0027
chr13	92000420	A	G	0.78	-0.03	0.0031	-0.027	0.0031
chr13	93058066	T	A	0.41	-0.015	0.0026	0.006	0.0026
chr13	93915730	G	C	0.5	0.015	0.0027	0.006	0.0027
chr13	96993465	G	A	0.1	-0.029	0.0044	-0.016	0.0044
chr13	100548455	C	A	0.22	0.03	0.0032	-0.028	0.0032
chr13	105125702	T	C	0.41	-0.017	0.0027	-0.011	0.0027
chr13	109890890	T	C	0.08	-0.026	0.0047	-0.002	0.0047
chr13	110557648	C	A	0.34	-0.018	0.0028	-0.009	0.0028
chr14	24534270	T	C	0.04	-0.041	0.0073	0.006	0.0073
chr14	28238250	T	C	0.11	0.025	0.0043	-0.023	0.0043
chr14	29349599	T	C	0.19	-0.024	0.0035	-0.022	0.0035
chr14	32478138	G	C	0.49	-0.017	0.0027	0.01	0.0027
chr14	47285766	T	C	0.51	-0.022	0.0026	0.005	0.0026
chr14	56493834	T	G	0.58	-0.015	0.0026	0.004	0.0026
chr14	57348922	T	G	0.66	-0.022	0.0028	-0.011	0.0028
chr14	77544662	T	C	0.18	0.024	0.0034	-0.009	0.0034
chr14	78594765	C	A	0.57	0.017	0.0027	0.001	0.0027
chr14	79486774	A	G	0.34	0.025	0.0028	-0.001	0.0028
chr14	82910647	T	C	0.46	0.017	0.0026	-0.016	0.0026
chr14	86116321	C	A	0.43	0.02	0.0026	-0.007	0.0026
chr14	98575320	A	G	0.25	0.028	0.0031	-0.013	0.0031
chr14	101173429	A	G	0.21	0.024	0.0032	-0.001	0.0032

chr14	103234396	G	C	0.2	0.023	0.0033	0.003	0.0033
chr15	33431921	T	C	0.5	-0.014	0.0026	0.011	0.0026
chr15	36402465	A	G	0.44	-0.017	0.0027	0.015	0.0027
chr15	38934425	T	A	0.83	-0.019	0.0035	-0.005	0.0035
chr15	47679232	A	G	0.36	0.03	0.0027	-0.011	0.0027
chr15	52279263	G	A	0.24	0.021	0.0034	0.003	0.0034
chr15	58018873	C	A	0.06	-0.032	0.0057	0.007	0.0057
chr15	66531364	T	C	0.45	0.016	0.0026	0.01	0.0026
chr15	67965102	G	A	0.59	0.018	0.0027	-0.014	0.0027
chr15	74052756	T	C	0.46	-0.02	0.0026	-0.009	0.0026
chr15	78025464	T	G	0.42	-0.02	0.0027	0.012	0.0027
chr15	81015065	T	C	0.33	-0.016	0.0028	0.015	0.0028
chr15	83937081	T	C	0.3	-0.024	0.0029	-0.004	0.0029
chr15	88427589	T	C	0.73	-0.017	0.003	0.001	0.003
chr15	93461263	G	C	0.81	-0.022	0.0033	0.016	0.0033
chr15	96865507	G	C	0.75	0.02	0.0033	-0.013	0.0033
chr16	3755360	G	A	0.23	0.02	0.0032	0.01	0.0032
chr16	5808520	G	A	0.29	0.02	0.0029	0.01	0.0029
chr16	7305747	T	A	0.31	0.016	0.0028	-0.014	0.0028
chr16	12503225	T	G	0.42	0.015	0.0027	-0.012	0.0027
chr16	13747851	A	G	0.29	0.022	0.0029	0.004	0.0029
chr16	25351948	G	A	0.71	0.035	0.0029	0	0.0029
chr16	50950805	T	C	0.22	-0.028	0.0032	0.011	0.0032
chr16	61775810	G	C	0.44	0.022	0.0027	-0.013	0.0027
chr16	64693429	T	G	0.48	0.016	0.0027	0.007	0.0027
chr16	72201119	G	A	0.55	0.023	0.0026	-0.014	0.0026
chr16	75602365	G	A	0.06	-0.05	0.0056	-0.007	0.0056
chr16	76506619	T	C	0.52	-0.02	0.0026	0.01	0.0026
chr16	82647971	T	C	0.47	-0.017	0.0026	-0.003	0.0026
chr16	89633538	A	G	0.24	-0.022	0.0035	-0.005	0.0035
chr17	1995177	T	C	0.54	0.022	0.0027	-0.007	0.0027
chr17	4888325	A	G	0.63	-0.015	0.0028	-0.014	0.0028
chr17	7789064	G	C	0.11	-0.045	0.0046	-0.04	0.0046
chr17	27322441	T	G	0.18	-0.033	0.0035	-0.001	0.0035
chr17	30654662	G	A	0.6	-0.015	0.0027	0.004	0.0027
chr17	32911191	C	A	0.85	0.025	0.004	-0.012	0.004
chr17	37504933	T	C	0.74	-0.02	0.003	-0.003	0.003
chr17	41913529	T	C	0.22	-0.028	0.0033	-0.002	0.0033
chr17	46531623	A	G	0.37	0.018	0.0027	-0.003	0.0027
chr17	50290955	T	C	0.31	0.026	0.0028	0.008	0.0028
chr17	71126783	T	C	0.35	0.017	0.0029	-0.004	0.0029
chr17	76778630	A	G	0.35	0.017	0.0029	-0.008	0.0029
chr18	5889765	G	A	0.64	-0.02	0.0029	0.01	0.0029

chr18	7767336	G	A	0.47	-0.015	0.0026	-0.007	0.0026
chr18	22621869	T	A	0.41	-0.018	0.0027	0	0.0027
chr18	25231495	G	A	0.6	0.021	0.0027	-0.012	0.0027
chr18	31732709	T	A	0.52	-0.02	0.0026	0.002	0.0026
chr18	36877648	G	A	0.2	-0.023	0.0033	0.002	0.0033
chr18	38184135	T	C	0.74	0.025	0.003	0.018	0.003
chr18	40171276	T	C	0.73	-0.021	0.0029	-0.018	0.0029
chr18	49988133	T	C	0.7	-0.029	0.0028	-0.005	0.0028
chr18	53696806	G	C	0.26	-0.029	0.003	0.005	0.003
chr18	58829919	T	C	0.32	0.022	0.0028	-0.007	0.0028
chr18	63879972	T	C	0.46	-0.016	0.0026	-0.011	0.0026
chr18	77562730	A	G	0.79	-0.027	0.0033	0.027	0.0033
chr19	4970593	T	G	0.3	-0.027	0.0029	0.02	0.0029
chr19	17372231	G	A	0.64	0.015	0.0027	0.007	0.0027
chr19	18633755	T	C	0.57	-0.02	0.0027	0.02	0.0027
chr19	29873963	G	A	0.47	-0.016	0.0026	0.001	0.0026
chr19	47281252	T	C	0.21	0.021	0.0032	-0.005	0.0032
chr19	51111444	A	G	0.04	0.067	0.0084	-0.034	0.0084
chr19	51815243	G	C	0.51	-0.015	0.0027	0.004	0.0027
chr20	20277285	G	A	0.43	0.015	0.0027	-0.004	0.0027
chr20	37420050	C	A	0.33	-0.017	0.0028	0.008	0.0028
chr20	39970544	G	C	0.41	0.016	0.0027	0.006	0.0027
chr20	54494252	T	C	0.45	0.016	0.0026	-0.004	0.0026
chr20	59006257	T	C	0.6	0.017	0.0027	0.012	0.0027
chr21	22367883	T	C	0.34	-0.021	0.0029	-0.005	0.0029
chr21	24416115	G	C	0.25	-0.017	0.0031	-0.001	0.0031
chr21	40579410	A	G	0.55	0.025	0.0026	-0.015	0.0026
chr21	42630093	G	A	0.4	-0.016	0.0027	0.004	0.0027
chr21	44955403	T	C	0.39	-0.02	0.0028	0.014	0.0028
chr22	40809034	G	A	0.35	0.017	0.0029	0.012	0.0029
chr22	46469639	G	C	0.57	0.021	0.0032	0.017	0.0032
chrx	7227644	A	G	0.32	-0.013	0.0024	0.011	0.0024
chrx	15291466	G	C	0.46	-0.012	0.0022	0.004	0.0022
chrx	23214048	T	C	0.76	-0.023	0.0025	-0.018	0.0025
chrx	50492754	T	G	0.97	0.107	0.0082	-0.008	0.0082
chrx	93318433	C	A	0.28	0.016	0.0024	0.005	0.0024
chrx	96807805	T	C	0.42	-0.017	0.0022	0.002	0.0022
chrx	126298636	G	A	0.66	-0.014	0.0023	0.011	0.0023
chrx	135495905	T	G	0.52	0.013	0.0024	-0.004	0.0024
chrx	139589364	T	C	0.28	0.018	0.0024	0.017	0.0024
chrx	142875163	A	G	0.48	0.016	0.0022	-0.011	0.0022
chrx	151466848	T	C	0.86	0.017	0.0031	-0.008	0.0031

**Table 4**

Table legend: Comparison of the observational adjusted odds ratios for the three exposures of interest (tobacco smoking, alcohol intake, and BMI) on risk of PD with the Mendelian randomisation effect estimate.

Observational odds ratios were adjusted for age and sex with mutual adjustment for the examined exposures.

Abbreviations: MR = Mendelian randomisation; OR = odds ratio; 95% CI = 95% confidence interval; BMI = body mass index.

<b>Phenotype</b>	<b>Method</b>	<b>OR</b>	<b>95% CI</b>	<b>P value</b>
<b>Tobacco</b>	Observed	0.788	0.759-0.817	1.30e-36
	MR	0.955	0.921 to 0.991	1.3e-2
<b>Alcohol</b>	Observed	0.843	0.832-0.854	2.28e-140
	MR	1.125	1.025 to 1.235	1.3e-2
<b>BMI</b>	Observed	0.973	0.969-0.976	5.27e-50
	MR	0.988	0.979 to 0.997	8.0e-3

Table 5

Table legend: Cochran's Q tests for heterogeneity in Mendelian randomisation estimates derived from meta-analysis of 23andMe cohorts 1 and 2.

Abbreviations: Q = Cochran's Q test for heterogeneity; df = degrees of freedom.

	<b>Q</b>	<b>df</b>	<b>P value</b>
<b>Tobacco use</b>	0.004	1	0.950
<b>Alcohol consumption</b>	0.013	1	0.908
<b>Body mass index</b>	3.034	1	0.082

**Table 6**

Table legend: Cochran's Q tests for heterogeneity in Mendelian randomisation estimates derived from meta-analysis of the 23andMe and IPDGC dataset.

Abbreviations: Q = Cochran's Q test for heterogeneity; df = degrees of freedom.

	<b>Q</b>	<b>Q_df</b>	<b>P value</b>
<b>Tobacco use</b>	2.025	1	0.155
<b>Alcohol consumption</b>	0.028	1	0.866
<b>Body mass index</b>	0.363	1	0.547

**Table 7**

Table legend: SNPs associated with alcohol intake (cohort 1). 181 SNPs associated with self-reported alcohol intake, 52 of which were removed by Steiger filtering. The effect of the SNPs on alcohol (the exposure) and Parkinson's disease (the outcome) is shown.

Abbreviations: Chr = chromosome; BP = position in base pairs; EA = effect allele; OA = other allele; EAF = effect allele frequency; Beta = per-allele odds ratio for a 1 standard measure daily increase in alcohol intake; SE = standard error.

<b>Chr</b>	<b>BP</b>	<b>EA</b>	<b>OA</b>	<b>EAF</b>	<b>Beta (exposure)</b>	<b>SE (exposure)</b>	<b>Beta (outcome)</b>	<b>SE (outcome)</b>
chr1	4564007	G	A	0.52	0.012	0.0022	-0.004	0.0148
chr1	26249835	G	C	0.75	0.015	0.0025	-0.006	0.0172
chr1	35360078	G	A	0.34	0.014	0.0024	0.01	0.0161
chr1	39981740	G	A	0.8	0.016	0.0029	0.009	0.0197
chr1	44809445	T	G	0.28	0.016	0.0024	0	0.0168
chr1	47693220	G	A	0.56	0.02	0.0022	-0.021	0.0149
chr1	50907438	T	C	0.51	0.013	0.0021	0.013	0.0149
chr1	72577895	A	G	0.44	0.017	0.0022	-0.005	0.0154
chr1	93509487	A	G	0.82	0.018	0.0032	0.017	0.0224
chr1	107467902	A	G	0.84	-0.018	0.0031	-0.026	0.0206
chr1	174184608	T	A	0.73	0.02	0.0024	0.022	0.0168
chr1	183597308	A	G	0.55	-0.013	0.0022	0	0.0152
chr1	196427811	T	C	0.69	-0.016	0.0023	-0.001	0.016
chr1	205328043	A	G	0.7	0.013	0.0024	-0.007	0.0164
chr2	27730940	T	C	0.42	-0.038	0.0022	-0.03	0.0151
chr2	42780563	A	G	0.61	-0.014	0.0024	0.016	0.0165
chr2	45152522	T	A	0.32	0.022	0.0023	-0.006	0.0161
chr2	55287327	G	A	0.33	0.014	0.0023	-0.004	0.0159
chr2	58350504	G	A	0.93	0.025	0.0044	0.029	0.03
chr2	98355676	A	G	0.92	-0.04	0.0041	-0.002	0.0288
chr2	103790006	G	A	0.74	-0.016	0.0026	0.007	0.0173
chr2	144215811	T	C	0.36	-0.017	0.0023	0.023	0.0155
chr2	147981914	G	A	0.96	-0.034	0.0056	-0.045	0.0386
chr2	162098155	C	A	0.8	0.016	0.0027	-0.019	0.0186
chr2	162869654	A	G	0.4	0.014	0.0022	0.018	0.0154
chr2	182366115	T	A	0.71	-0.014	0.0024	-0.005	0.0167
chr2	185458209	G	C	0.74	0.015	0.0025	-0.001	0.0171
chr2	215384864	G	A	0.49	-0.014	0.0022	-0.011	0.015
chr2	225347713	C	A	0.34	-0.014	0.0023	0.001	0.0157
chr2	226870869	C	A	0.92	0.025	0.0043	-0.007	0.0296
chr3	24331310	T	A	0.04	0.033	0.0058	-0.018	0.0407
chr3	31715892	T	A	0.82	0.017	0.0028	0.012	0.0196
chr3	71010071	G	C	0.35	-0.016	0.0024	0.01	0.016
chr3	83755411	A	G	0.56	0.013	0.0022	0.013	0.0152
chr3	85604041	T	G	0.38	0.028	0.0022	0.037	0.0153
chr3	117805169	A	G	0.57	0.013	0.0022	-0.006	0.0151

chr3	118903292	T	C	0.05	-0.033	0.0058	-0.007	0.0401
chr3	147126442	G	A	0.1	0.024	0.0037	0.03	0.0243
chr4	3142661	A	G	0.93	0.04	0.0044	0.015	0.031
chr4	39415925	A	G	0.42	-0.04	0.0022	0.025	0.0151
chr4	45186139	G	A	0.57	0.017	0.0022	0.014	0.015
chr4	46223562	A	G	0.38	-0.016	0.0022	-0.014	0.0155
chr4	46999235	G	A	0.4	0.013	0.0022	-0.003	0.0152
chr4	67905491	T	C	0.56	0.013	0.0022	0.002	0.015
chr4	105405694	G	A	0.61	0.018	0.0022	0.014	0.0153
chr4	130232479	T	G	0.16	-0.017	0.0029	0.006	0.0202
chr4	143729486	A	G	0.69	0.015	0.0023	-0.008	0.016
chr4	152991055	G	A	0.75	0.017	0.0025	0.015	0.0172
chr5	20111635	A	G	0.62	-0.015	0.0022	0.011	0.0154
chr5	50488024	T	C	0.66	0.013	0.0023	-0.018	0.0157
chr5	92435481	T	G	0.36	0.018	0.0023	-0.002	0.0157
chr5	138296615	G	C	0.32	0.015	0.0024	0.018	0.0163
chr5	139059016	G	A	0.66	0.015	0.0023	0.011	0.0159
chr5	144517829	A	G	0.49	-0.017	0.0022	-0.011	0.0151
chr5	152000919	A	G	0.42	0.013	0.0022	-0.011	0.0152
chr5	166832774	A	G	0.48	-0.017	0.0024	0.001	0.0162
chr6	396321	T	C	0.17	-0.017	0.0029	-0.006	0.0202
chr6	16967240	G	A	0.64	0.012	0.0022	0.002	0.0155
chr6	69855199	G	A	0.31	0.013	0.0023	0.014	0.0162
chr6	71507158	T	C	0.8	-0.016	0.0027	0.015	0.0187
chr6	79172613	C	A	0.38	-0.012	0.0022	-0.015	0.0154
chr6	84328833	A	G	0.61	0.016	0.0026	-0.005	0.0182
chr6	104986268	T	A	0.63	0.015	0.0024	-0.019	0.0162
chr6	147220049	C	A	0.68	0.013	0.0023	-0.001	0.0162
chr7	1809120	G	A	0.77	-0.014	0.0026	0.011	0.0177
chr7	69867401	G	A	0.31	0.017	0.0024	-0.016	0.0166
chr7	131929709	T	C	0.37	0.013	0.0022	-0.01	0.0154
chr7	141673345	G	C	0.41	-0.018	0.0022	-0.003	0.016
chr7	153489530	G	A	0.54	-0.023	0.0024	-0.005	0.0162
chr8	26220923	T	G	0.95	-0.029	0.0051	0.025	0.0352
chr8	53207030	G	C	0.3	0.013	0.0024	0.011	0.0164
chr8	56361646	A	G	0.36	0.013	0.0023	0.014	0.0157
chr8	64686162	G	A	0.71	0.026	0.0024	-0.004	0.0162
chr8	73905466	T	G	0.54	-0.012	0.0022	0.012	0.0149
chr8	93348076	T	C	0.37	-0.012	0.0022	0.009	0.0153
chr8	126500031	G	C	0.42	0.012	0.0022	0.002	0.0151
chr9	23917489	C	A	0.73	-0.013	0.0024	-0.011	0.0169
chr9	37039669	A	G	0.27	0.016	0.0026	0.003	0.0176
chr9	97186527	G	A	0.58	0.012	0.0022	0	0.0153



chr9	127512040	G	A	0.5	-0.016	0.0023	0.021	0.0154
chr9	135490787	T	C	0.67	0.014	0.0023	-0.012	0.0158
chr10	8098185	G	A	0.72	0.014	0.0025	0.008	0.017
chr10	10075434	G	A	0.68	0.016	0.0027	0.002	0.0183
chr10	22014647	A	G	0.6	0.014	0.0024	0.02	0.0162
chr10	64740040	A	G	0.45	-0.013	0.0022	0.013	0.0154
chr10	102626510	T	G	0.34	-0.02	0.0025	0.001	0.0168
chr10	125064283	G	C	0.15	-0.019	0.003	0.003	0.0204
chr10	127030605	T	C	0.2	-0.016	0.0027	-0.012	0.0189
chr10	129153412	A	G	0.25	-0.014	0.0025	-0.009	0.0178
chr10	133972449	T	G	0.62	0.013	0.0023	0.019	0.0156
chr11	8693405	G	A	0.64	-0.017	0.0023	-0.011	0.0156
chr11	41418261	T	C	0.51	0.016	0.0022	0.011	0.0149
chr11	115549043	A	G	0.16	-0.017	0.0029	0.021	0.0201
chr12	6871709	G	A	0.78	0.017	0.0027	-0.014	0.0185
chr12	23061679	G	A	0.69	-0.014	0.0024	0.009	0.0163
chr12	50263148	G	A	0.61	0.02	0.0022	0.011	0.0152
chr12	92186996	C	A	0.45	0.013	0.0022	-0.002	0.0149
chr12	124820705	G	A	0.85	-0.017	0.003	-0.025	0.0206
chr13	36058983	T	G	0.42	-0.013	0.0022	-0.007	0.0151
chr13	58653695	G	A	0.31	-0.015	0.0023	0.008	0.016
chr13	79580675	A	G	0.61	-0.013	0.0022	0.004	0.0154
chr14	29944139	G	C	0.06	0.028	0.005	0.027	0.0347
chr14	33163056	G	C	0.54	-0.013	0.0022	-0.006	0.0148
chr14	38764277	G	A	0.29	0.015	0.0024	0.019	0.0167
chr14	69460437	G	C	0.47	-0.013	0.0022	-0.016	0.0149
chr14	80303407	T	C	0.56	0.013	0.0022	-0.015	0.015
chr15	77849191	T	C	0.69	0.016	0.0023	0.013	0.0163
chr15	78858400	G	C	0.21	0.021	0.0027	0.008	0.0183
chr15	89951979	T	C	0.58	0.015	0.0022	-0.002	0.0151
chr16	22914926	T	C	0.91	0.026	0.004	0.001	0.0272
chr16	30078492	G	C	0.5	0.023	0.0024	0.024	0.0158
chr16	53822170	A	G	0.65	0.022	0.0023	-0.003	0.0161
chr16	69504528	A	G	0.58	-0.013	0.0023	0.017	0.0157
chr16	73912588	G	C	0.57	0.02	0.0023	-0.008	0.0155
chr17	37614826	A	G	0.73	0.017	0.0026	-0.001	0.0178
chr17	47097350	A	G	0.64	-0.017	0.0023	0.003	0.0156
chr18	38107825	G	C	0.52	-0.014	0.0022	0.008	0.0149
chr18	39938611	A	G	0.23	-0.015	0.0026	-0.01	0.018
chr18	53234728	G	A	0.93	-0.029	0.0043	0.014	0.0297
chr19	30344536	T	C	0.27	-0.014	0.0024	-0.018	0.0168
chr19	42419637	T	C	0.06	-0.025	0.0045	0.036	0.0308
chr19	49213833	G	A	0.49	-0.025	0.0022	-0.016	0.0149

<b>chr20</b>	15829198	G	A	0.36	-0.013	0.0022	0.002	0.0155
<b>chr20</b>	51156432	G	A	0.73	-0.016	0.0024	-0.013	0.0166
<b>chr21</b>	24840605	G	A	0.82	-0.017	0.0029	-0.001	0.0196
<b>chr21</b>	34441675	C	A	0.42	0.014	0.0022	0.008	0.0151
<b>chr22</b>	30233257	A	G	0.37	0.016	0.0023	-0.004	0.0157
<b>chr22</b>	39933269	A	G	0.66	-0.013	0.0023	0.011	0.0162
<b>chrX</b>	109694685	T	A	0.58	-0.012	0.0018	-0.005	0.0119

**Table 8**

Table legend: SNPs associated with alcohol intake (cohort 2). 170 SNPs associated with self-reported alcohol intake, 46 of which were removed by Steiger filtering. The effect of the SNPs on alcohol (the exposure) and Parkinson's disease (the outcome) is shown.

Abbreviations: Chr = chromosome; BP = position in base pairs; EA = effect allele; OA = other allele; EAF = effect allele frequency; Beta = per-allele odds ratio of being an ever-smoker; SE = standard error.

<b>Chr</b>	<b>BP</b>	<b>EA</b>	<b>OA</b>	<b>EAF</b>	<b>Beta (exposure)</b>	<b>SE (exposure)</b>	<b>Beta (outcome)</b>	<b>SE (outcome)</b>
chr1	8895970	G	C	0.26	-0.014	0.0025	0.019	0.0171
chr1	11095424	T	A	0.79	-0.016	0.0028	-0.001	0.0194
chr1	44827158	G	A	0.31	0.013	0.0024	0.011	0.0164
chr1	66430936	T	C	0.26	-0.014	0.0024	0.003	0.017
chr1	71502065	G	A	0.72	-0.018	0.0024	0.021	0.0166
chr1	90917395	T	C	0.56	0.013	0.0022	0.009	0.015
chr1	96709385	A	G	0.69	0.015	0.0023	0.005	0.0162
chr1	174717010	A	G	0.71	0.021	0.0024	0.006	0.0167
chr1	181612504	G	A	0.17	0.019	0.0029	-0.001	0.0201
chr1	206643106	T	C	0.2	-0.017	0.0027	0.008	0.0186
chr1	211619379	G	A	0.06	-0.028	0.0047	-0.03	0.0331
chr1	243627135	G	A	0.86	-0.018	0.0032	-0.002	0.0223
chr2	422144	T	C	0.95	0.029	0.0053	-0.003	0.0383
chr2	975823	T	C	0.68	-0.013	0.0023	-0.011	0.0163
chr2	26370685	A	G	0.76	-0.017	0.0029	0.003	0.0199
chr2	27730940	T	C	0.42	-0.037	0.0022	-0.008	0.0152
chr2	29420315	T	C	0.22	0.015	0.0026	0.015	0.0179
chr2	55271875	T	C	0.43	0.014	0.0022	0.009	0.0151
chr2	58110969	C	A	0.41	-0.017	0.0022	-0.008	0.0153
chr2	63006003	A	G	0.35	0.015	0.0024	0.021	0.0161
chr2	74232251	T	C	0.89	0.021	0.0036	0.011	0.0247
chr2	98380681	T	C	0.93	-0.033	0.0042	-0.043	0.029
chr2	103834925	T	C	0.26	0.019	0.0026	0.014	0.0175
chr2	137508441	G	A	0.1	0.021	0.0036	0.028	0.0249
chr2	144261657	G	A	0.63	0.016	0.0023	0.011	0.0156
chr2	146420104	C	A	0.83	0.018	0.0028	-0.011	0.0197
chr2	151345113	G	A	0.72	0.013	0.0024	0.01	0.0168
chr2	175054604	A	G	0.57	0.015	0.0022	-0.019	0.0152
chr2	178125898	A	G	0.38	-0.014	0.0023	-0.007	0.0158
chr2	182520995	C	A	0.37	0.014	0.0022	-0.01	0.0155
chr2	185636993	A	G	0.76	-0.019	0.0029	-0.024	0.0198
chr2	199207258	T	C	0.52	-0.013	0.0022	-0.01	0.0155
chr2	203438859	T	C	0.9	0.023	0.0037	0.03	0.0262
chr2	227178726	T	C	0.36	0.018	0.0023	-0.018	0.0157
chr3	24055654	C	A	0.32	0.016	0.0023	-0.002	0.0159
chr3	28752734	T	A	0.47	0.013	0.0021	-0.017	0.015

chr3	67352237	G	A	0.26	-0.014	0.0025	-0.007	0.0171
chr3	70909039	T	C	0.67	0.018	0.0023	0.015	0.0159
chr3	85471326	A	G	0.39	0.028	0.0022	0.004	0.0153
chr3	89474554	A	G	0.63	-0.015	0.0023	-0.015	0.0159
chr3	95010488	C	A	0.59	-0.012	0.0022	0.019	0.0154
chr3	117748947	G	A	0.33	-0.014	0.0023	0.018	0.0158
chr3	131466297	A	G	0.73	0.015	0.0024	-0.013	0.0169
chr3	147106319	T	C	0.21	-0.018	0.0026	0.023	0.0182
chr3	153736824	A	G	0.51	0.013	0.0022	-0.012	0.015
chr3	160905227	A	G	0.49	0.014	0.0022	0.016	0.0151
chr3	183997444	A	G	0.5	0.013	0.0022	0.016	0.0151
chr4	3241845	T	C	0.07	-0.042	0.0043	0	0.0305
chr4	29715207	A	G	0.52	0.012	0.0022	0.019	0.015
chr4	39414993	G	A	0.59	0.04	0.0022	0.011	0.0152
chr4	45181334	T	A	0.43	-0.018	0.0022	0.013	0.0151
chr4	67831578	T	C	0.55	0.015	0.0022	0.001	0.0152
chr4	80187053	T	C	0.46	0.012	0.0022	-0.009	0.0154
chr4	94482064	A	G	0.26	-0.015	0.0025	0.012	0.0172
chr4	113595869	T	C	0.31	0.013	0.0023	-0.02	0.0163
chr4	129827145	C	A	0.84	-0.017	0.0029	0.004	0.0204
chr4	143500223	G	A	0.69	0.013	0.0023	0.005	0.0161
chr5	19962081	G	C	0.37	0.014	0.0022	0.012	0.0155
chr5	80263403	G	A	0.35	-0.016	0.0023	-0.006	0.0158
chr5	92362700	T	C	0.32	0.019	0.0023	0.006	0.0161
chr5	93496811	C	A	0.31	-0.013	0.0023	0.01	0.0162
chr6	16743006	T	C	0.32	-0.013	0.0023	0.014	0.016
chr6	51059932	A	G	0.16	0.022	0.003	-0.001	0.0207
chr6	76397679	A	G	0.23	-0.016	0.0026	0.015	0.0179
chr6	98344031	G	A	0.62	-0.013	0.0022	-0.019	0.0154
chr6	147230149	T	G	0.65	0.015	0.0023	0.009	0.0159
chr7	1212680	A	G	0.84	-0.022	0.0034	0	0.0221
chr7	20318551	T	C	0.43	0.013	0.0023	0.008	0.0158
chr7	39324253	T	G	0.62	-0.015	0.0022	-0.013	0.0153
chr7	69110061	A	G	0.64	0.014	0.0024	0.016	0.0169
chr7	73035857	T	C	0.72	-0.018	0.0024	0.022	0.0168
chr7	131927170	T	C	0.37	0.012	0.0022	-0.008	0.0155
chr7	141673345	G	C	0.41	-0.014	0.0022	-0.004	0.0161
chr7	153488760	G	A	0.48	0.026	0.0023	0.001	0.0159
chr8	4849606	G	A	0.67	-0.015	0.0023	0.013	0.0161
chr8	22875909	G	A	0.32	0.014	0.0023	-0.009	0.016
chr8	126504384	A	G	0.4	-0.015	0.0024	-0.021	0.0167
chr8	142230003	A	G	0.89	-0.02	0.0035	-0.021	0.0245
chr9	28425515	G	C	0.31	-0.013	0.0023	-0.01	0.0162

chr9	37361455	C	A	0.38	0.013	0.0022	0.015	0.0154
chr9	76185588	C	A	0.62	-0.014	0.0022	0.003	0.0154
chr9	92505717	G	A	0.46	-0.012	0.0022	0.015	0.0151
chr9	108699720	A	G	0.18	-0.017	0.0029	-0.018	0.0198
chr9	109389147	G	A	0.28	-0.018	0.0024	0.02	0.0166
chr9	126537668	C	A	0.12	-0.019	0.0033	0.023	0.0234
chr10	65182718	A	G	0.68	0.014	0.0023	0.015	0.0161
chr10	125093880	T	C	0.15	-0.022	0.003	-0.032	0.0212
chr11	4734299	G	A	0.9	0.023	0.004	-0.023	0.0268
chr11	8636339	G	C	0.37	0.017	0.0022	0.018	0.0155
chr11	121800971	G	A	0.59	0.017	0.0022	0.011	0.0156
chr11	126608620	T	C	0.57	-0.012	0.0022	0.007	0.0153
chr11	132176500	T	C	0.54	-0.013	0.0022	-0.004	0.0151
chr12	6596326	G	C	0.28	0.014	0.0024	-0.015	0.0166
chr12	23984396	G	A	0.65	-0.013	0.0024	-0.007	0.0162
chr12	50263148	G	A	0.61	0.018	0.0022	-0.004	0.0153
chr12	54093041	G	A	0.86	0.018	0.0032	-0.016	0.022
chr12	60787794	G	C	0.24	0.019	0.0026	0.003	0.0176
chr12	83166484	T	C	0.13	0.023	0.004	-0.004	0.0365
chr13	27118983	T	C	0.26	0.016	0.0025	-0.02	0.0173
chr13	36052924	C	A	0.38	-0.012	0.0022	-0.005	0.0155
chr13	80168720	G	C	0.49	-0.013	0.0022	-0.009	0.0152
chr13	112614966	A	G	0.36	0.014	0.0022	0.007	0.0156
chr15	38838264	T	C	0.73	0.013	0.0024	-0.002	0.0168
chr15	74629723	T	C	0.06	0.047	0.0058	-0.004	0.0421
chr16	25248442	T	C	0.52	-0.015	0.0021	-0.007	0.015
chr16	53809123	T	C	0.41	-0.019	0.0022	-0.008	0.0152
chr16	69349785	T	C	0.69	0.013	0.0023	0	0.0162
chr16	71673350	A	G	0.5	-0.015	0.0022	0.005	0.0155
chr16	73912503	T	C	0.81	0.023	0.0028	-0.014	0.0194
chr17	37716111	A	G	0.32	-0.016	0.0025	0	0.0175
chr18	25228960	T	C	0.47	-0.012	0.0021	0.012	0.0149
chr18	50759317	T	C	0.72	-0.018	0.0027	-0.008	0.0186
chr18	53085412	T	C	0.54	0.015	0.0022	-0.001	0.015
chr19	5296420	G	A	0.54	0.012	0.0022	-0.012	0.0153
chr19	42667607	G	A	0.9	-0.022	0.0038	0.009	0.026
chr19	49248730	G	A	0.44	0.021	0.0022	-0.006	0.0153
chr19	50072067	T	G	0.25	-0.016	0.0026	0.007	0.018
chr20	12414684	T	C	0.45	-0.013	0.0022	-0.005	0.0151
chr22	24886476	T	C	0.39	-0.013	0.0022	-0.01	0.0153
chr22	39994105	G	A	0.86	-0.018	0.0031	0.014	0.022
chrX	6530935	G	C	0.68	0.011	0.002	0.008	0.0133
chrX	55767459	A	G	0.3	-0.02	0.002	-0.026	0.0133

<b>chrX</b>	109703961	T	C	0.41	0.013	0.0018	0.005	0.0121
<b>chrX</b>	136643924	A	G	0.53	-0.01	0.0018	-0.001	0.0121

**Table 9**

Table legend: SNPs associated with BMI (cohort 1). 838 SNPs associated with BMI, 109 of which were removed by Steiger filtering. The effect of the SNPs on BMI (the exposure) and Parkinson's disease (the outcome) is shown.

Abbreviations: Chr = chromosome; BP = position in base pairs; EA = effect allele; OA = other allele; EAF = effect allele frequency; Beta = per-allele odds ratio for a 1 kg/m<sup>2</sup> increase in BMI; SE = standard error.

<b>Chr</b>	<b>BP</b>	<b>EA</b>	<b>OA</b>	<b>EAF</b>	<b>Beta (exposure)</b>	<b>SE (exposure)</b>	<b>Beta (outcome)</b>	<b>SE (outcome)</b>
chr1	2444414	G	A	0.63	0.089	0.0078	-0.016	0.0154
chr1	6715901	T	C	0.65	-0.072	0.008	-0.011	0.0156
chr1	14087114	C	A	0.25	-0.055	0.0087	0.004	0.0172
chr1	15993603	G	A	0.67	0.059	0.008	-0.005	0.016
chr1	18527951	T	C	0.2	-0.052	0.0093	0.004	0.0184
chr1	27145830	A	G	0.07	0.105	0.0162	0.009	0.0322
chr1	28704850	A	G	0.28	0.058	0.0088	-0.008	0.0175
chr1	30948709	C	A	0.5	0.05	0.0075	0	0.0148
chr1	34287512	T	C	0.52	-0.059	0.0074	0.008	0.0148
chr1	42637234	C	A	0.46	0.052	0.0076	-0.006	0.0151
chr1	44098868	A	G	0.41	-0.05	0.0077	-0.004	0.0153
chr1	47689842	G	C	0.6	-0.1	0.0076	-0.028	0.0151
chr1	49661516	T	C	0.32	0.116	0.008	0.028	0.0159
chr1	52316785	T	C	0.46	0.044	0.0075	-0.009	0.0149
chr1	54741632	G	A	0.24	0.07	0.0099	-0.014	0.0195
chr1	58462706	T	C	0.54	-0.06	0.0077	0.003	0.0151
chr1	62579891	T	G	0.09	-0.209	0.0136	-0.032	0.0278
chr1	65979280	T	C	0.91	-0.132	0.013	-0.006	0.0255
chr1	72765116	G	A	0.36	-0.188	0.0078	-0.006	0.0154
chr1	78450517	C	A	0.89	-0.239	0.0123	0.014	0.0252
chr1	86822231	G	A	0.15	0.061	0.0106	0.007	0.0211
chr1	93108849	A	G	0.1	0.09	0.0129	0.026	0.0255
chr1	97071816	G	A	0.69	-0.126	0.0082	0.044	0.0165
chr1	107885018	G	C	0.23	0.104	0.0092	-0.003	0.018
chr1	112317512	C	A	0.61	-0.069	0.0077	-0.007	0.0152
chr1	117874853	A	G	0.36	-0.067	0.0079	0.019	0.0155
chr1	119503843	G	C	0.6	-0.067	0.0077	-0.013	0.0152
chr1	151114484	G	C	0.7	-0.122	0.0082	-0.022	0.0162
chr1	157075867	T	C	0.06	-0.089	0.0156	-0.015	0.031
chr1	161427439	T	A	0.88	-0.083	0.0121	0.013	0.024
chr1	163386919	G	A	0.86	-0.069	0.0127	0.002	0.0251
chr1	169078572	T	C	0.23	-0.052	0.0091	0.01	0.0178
chr1	171833688	G	A	0.89	-0.075	0.0121	-0.017	0.0236
chr1	177894591	T	G	0.81	-0.32	0.0096	0.006	0.0191
chr1	182029264	G	A	0.14	0.07	0.0109	0.007	0.0216
chr1	184659545	A	G	0.47	0.056	0.0075	0.012	0.0149

chr1	187734601	G	C	0.77	-0.065	0.0089	-0.006	0.0177
chr1	190294726	T	C	0.42	0.109	0.0076	-0.002	0.0151
chr1	193663788	G	A	0.54	0.047	0.0075	-0.006	0.0149
chr1	195042525	G	A	0.38	-0.072	0.0078	0	0.0154
chr1	201860626	G	A	0.68	-0.125	0.008	0.014	0.016
chr1	209269627	G	A	0.55	0.052	0.0076	-0.003	0.015
chr1	210819791	T	G	0.67	-0.05	0.008	-0.018	0.0159
chr1	213497085	G	A	0.94	0.104	0.0167	0.008	0.0329
chr1	216710798	C	A	0.33	0.055	0.008	0.003	0.0158
chr1	219628682	T	C	0.56	0.065	0.0076	-0.001	0.0152
chr1	222911960	T	G	0.68	-0.045	0.008	0.014	0.0161
chr1	232779187	T	C	0.43	0.042	0.0076	0.002	0.015
chr1	235517040	T	C	0.03	0.148	0.0214	0.034	0.0417
chr1	241032670	T	A	0.73	0.06	0.0085	-0.006	0.0168
chr1	242990382	G	A	0.21	0.091	0.0092	0.005	0.0183
chr2	624205	T	G	0.18	-0.402	0.0098	0.001	0.0194
chr2	2971477	G	C	0.54	-0.041	0.0075	0.012	0.015
chr2	4858673	G	A	0.37	-0.063	0.0078	-0.013	0.0155
chr2	6153356	G	A	0.3	-0.094	0.0082	-0.002	0.0161
chr2	8114580	A	G	0.59	0.052	0.0079	-0.015	0.0156
chr2	10953844	T	C	0.29	0.055	0.0083	0.007	0.0165
chr2	12877060	G	A	0.52	-0.051	0.0075	0.013	0.0149
chr2	13783987	T	C	0.09	0.072	0.0129	0.008	0.0256
chr2	15437656	T	C	0.45	-0.063	0.0075	0	0.0149
chr2	16617417	T	C	0.65	0.06	0.0081	-0.016	0.0158
chr2	20575012	G	A	0.67	0.05	0.0082	-0.017	0.016
chr2	21422928	T	C	0.2	0.069	0.0093	-0.009	0.0185
chr2	22546631	G	A	0.57	0.051	0.0077	0.014	0.0152
chr2	25143649	G	C	0.47	0.211	0.0075	-0.022	0.0149
chr2	35461715	A	G	0.51	-0.068	0.0079	0.001	0.0155
chr2	36788616	G	A	0.36	0.054	0.0078	-0.021	0.0155
chr2	41456687	A	G	0.38	-0.073	0.0078	-0.015	0.0154
chr2	46056423	G	A	0.45	0.051	0.0075	0.012	0.0149
chr2	53070332	T	A	0.52	-0.071	0.0075	0.013	0.0149
chr2	58951187	G	A	0.57	0.153	0.0076	-0.009	0.015
chr2	65673699	A	G	0.1	0.124	0.0135	-0.027	0.0268
chr2	66368830	G	C	0.13	-0.068	0.0115	0.017	0.0227
chr2	67837553	T	C	0.59	0.067	0.0076	-0.013	0.015
chr2	69529531	T	C	0.16	0.067	0.0104	-0.023	0.0207
chr2	71695111	T	G	0.32	-0.054	0.0082	0.009	0.0161
chr2	79483599	A	G	0.88	-0.114	0.0117	-0.001	0.023
chr2	80351607	T	C	0.26	0.064	0.0086	0.017	0.017
chr2	81950661	T	C	0.66	-0.051	0.0081	-0.022	0.016



chr2	86773494	A	G	0.64	-0.084	0.0078	0.009	0.0155
chr2	97598899	G	A	0.15	0.115	0.0107	-0.026	0.0212
chr2	100893113	C	A	0.32	0.115	0.0081	-0.005	0.0161
chr2	105698549	T	C	0.29	-0.081	0.0082	-0.006	0.0163
chr2	111913056	T	C	0.89	-0.093	0.0125	0.004	0.0246
chr2	119579558	G	A	0.56	-0.053	0.0076	0.002	0.015
chr2	121318547	G	A	0.73	0.053	0.0085	-0.004	0.0169
chr2	125000429	T	G	0.33	-0.053	0.008	-0.015	0.0158
chr2	126343786	C	A	0.21	0.055	0.0093	0.023	0.0184
chr2	128510982	G	A	0.65	0.048	0.0079	-0.015	0.0156
chr2	142309486	G	A	0.45	0.071	0.0075	-0.016	0.0149
chr2	145273364	A	G	0.68	-0.057	0.0088	-0.006	0.0175
chr2	147890505	A	G	0.85	-0.102	0.0105	0.004	0.021
chr2	157012225	C	A	0.63	-0.063	0.0078	-0.003	0.0154
chr2	159410560	T	G	0.85	0.107	0.0107	-0.039	0.021
chr2	175241566	G	A	0.82	0.119	0.0099	-0.004	0.0196
chr2	176399736	T	C	0.87	0.073	0.0113	0.007	0.0224
chr2	181602526	T	C	0.67	0.106	0.0079	-0.019	0.0157
chr2	193859247	G	A	0.24	-0.078	0.0089	-0.018	0.0176
chr2	195880444	G	A	0.68	-0.045	0.008	0.019	0.0159
chr2	213402964	A	G	0.26	-0.091	0.0085	-0.005	0.017
chr2	215379188	G	A	0.61	0.066	0.0077	-0.001	0.0152
chr2	217337508	A	G	0.52	0.053	0.0075	-0.006	0.0149
chr2	220161306	T	C	0.15	-0.112	0.0104	-0.024	0.0206
chr2	221644022	T	C	0.64	-0.054	0.0082	0.001	0.0162
chr2	223455268	A	G	0.61	-0.045	0.0077	0.007	0.0152
chr2	225409304	G	A	0.18	-0.102	0.0101	-0.002	0.0199
chr2	227028846	T	C	0.47	0.048	0.0075	0.02	0.0149
chr2	227770707	A	G	0.38	0.059	0.0078	-0.025	0.0156
chr2	229017931	C	A	0.35	0.09	0.008	-0.02	0.0159
chr2	236813567	T	G	0.76	-0.09	0.0088	0.014	0.0175
chr2	241699239	T	C	0.27	0.05	0.0085	0	0.0168
chr2	242612151	T	C	0.07	-0.102	0.0179	0	0.0371
chr3	1275186	G	A	0.84	-0.066	0.0105	0.016	0.0209
chr3	5964793	C	A	0.34	0.091	0.008	0.003	0.0159
chr3	8138801	T	A	0.53	0.077	0.0076	0.012	0.015
chr3	12393682	G	A	0.12	0.148	0.0113	-0.012	0.0227
chr3	15891360	T	C	0.4	0.06	0.0077	-0.007	0.0152
chr3	18700484	T	C	0.72	0.091	0.0084	-0.033	0.0164
chr3	20667349	C	A	0.24	-0.118	0.0088	-0.018	0.0175
chr3	21812352	T	C	0.76	-0.076	0.0087	-0.023	0.0172
chr3	23286741	G	A	0.91	-0.096	0.0131	0	0.0262
chr3	25110415	T	A	0.41	-0.119	0.0076	-0.006	0.0151

chr3	26446285	T	C	0.28	-0.053	0.0085	0.006	0.0166
chr3	27758274	T	G	0.46	0.041	0.0076	-0.014	0.015
chr3	28629298	C	A	0.69	-0.06	0.0082	-0.012	0.0161
chr3	30242892	T	G	0.47	-0.042	0.0075	0.016	0.0149
chr3	30813237	G	A	0.43	-0.048	0.0076	-0.003	0.0151
chr3	31551780	G	A	0.77	-0.05	0.009	0.005	0.0178
chr3	35005099	G	A	0.15	0.103	0.0105	-0.023	0.0208
chr3	41281413	T	A	0.6	-0.06	0.008	-0.015	0.0159
chr3	42418446	G	A	0.81	-0.11	0.0096	0.004	0.0191
chr3	58447299	T	C	0.38	0.069	0.0081	0.014	0.0157
chr3	61243611	T	C	0.59	0.095	0.0076	0.009	0.0151
chr3	70474728	A	G	0.29	0.092	0.0084	0.001	0.0166
chr3	74490141	T	C	0.33	0.062	0.008	0.021	0.0158
chr3	77642438	G	A	0.6	-0.095	0.0078	0.007	0.0154
chr3	79769943	A	G	0.22	0.061	0.0099	-0.002	0.0198
chr3	85849261	G	C	0.78	-0.088	0.0091	-0.005	0.0179
chr3	88174395	C	A	0.9	0.108	0.0125	-0.012	0.0249
chr3	93982369	T	C	0.48	0.091	0.0075	-0.017	0.0149
chr3	100058300	T	C	0.77	-0.052	0.009	-0.007	0.0178
chr3	104616604	A	G	0.24	0.093	0.0094	0.016	0.0185
chr3	107310948	A	G	0.17	0.081	0.01	-0.007	0.02
chr3	117515519	T	C	0.72	-0.077	0.0084	0.01	0.0167
chr3	119542124	T	A	0.19	-0.066	0.0096	-0.02	0.0192
chr3	122049952	A	G	0.68	0.049	0.0084	-0.004	0.0165
chr3	123062657	T	G	0.64	0.065	0.008	-0.01	0.0158
chr3	127173463	T	G	0.27	0.056	0.0085	0.012	0.0168
chr3	131761204	A	G	0.69	-0.11	0.0081	0.023	0.016
chr3	138088221	T	A	0.19	0.127	0.0096	0.009	0.019
chr3	139257603	G	A	0.18	0.078	0.0099	-0.028	0.0197
chr3	141338415	G	A	0.93	-0.188	0.0153	0.002	0.0303
chr3	143809274	T	C	0.65	-0.045	0.0079	0.002	0.0156
chr3	147262762	A	G	0.85	-0.107	0.0105	0.011	0.0208
chr3	148807357	A	G	0.29	0.062	0.0089	-0.002	0.0176
chr3	150116989	G	A	0.5	-0.044	0.0075	0.01	0.0149
chr3	156292361	T	C	0.25	-0.068	0.0086	-0.009	0.0171
chr3	157865305	A	G	0.68	-0.052	0.009	-0.002	0.0177
chr3	161468638	C	A	0.43	0.084	0.0076	0.014	0.015
chr3	167099370	T	A	0.59	0.051	0.0077	0.005	0.0152
chr3	168170009	T	C	0.11	0.075	0.012	-0.003	0.0238
chr3	170744815	T	C	0.71	-0.079	0.0083	0.003	0.0165
chr3	172054698	A	G	0.23	-0.057	0.0095	0.01	0.0189
chr3	173112907	T	C	0.45	-0.085	0.0076	0.006	0.015
chr3	176898161	A	G	0.24	0.054	0.0094	-0.004	0.0187

chr3	178162128	G	C	0.04	0.214	0.02	-0.029	0.0403
chr3	179111894	T	C	0.07	-0.087	0.0156	0.009	0.0307
chr3	183997444	A	G	0.5	-0.087	0.0075	0.026	0.015
chr3	185802628	C	A	0.13	-0.22	0.011	0.049	0.0214
chr3	188517106	T	C	0.67	0.044	0.008	0.015	0.0158
chr3	190642837	T	C	0.36	0.072	0.0081	-0.009	0.0161
chr3	192412460	T	G	0.53	0.042	0.0076	0.008	0.015
chr3	193922184	C	A	0.79	-0.066	0.0098	0.01	0.0191
chr3	194988940	T	C	0.59	0.066	0.0077	0.017	0.0153
chr3	196136812	A	G	0.6	-0.084	0.0084	0.001	0.0165
chr3	197027094	A	G	0.6	-0.046	0.0079	0.003	0.0157
chr4	3142661	A	G	0.93	-0.215	0.0153	0.015	0.031
chr4	11670645	G	A	0.6	0.05	0.0078	-0.005	0.0153
chr4	12955259	G	C	0.43	0.045	0.0076	0.011	0.015
chr4	14252823	C	A	0.05	-0.093	0.0169	0.015	0.0328
chr4	18450586	A	G	0.67	-0.077	0.008	0.015	0.0159
chr4	20530374	T	C	0.75	0.075	0.0086	0	0.017
chr4	30843533	T	C	0.6	-0.083	0.0077	-0.007	0.0151
chr4	31940664	A	G	0.19	-0.063	0.0099	-0.001	0.0196
chr4	37238386	G	C	0.44	-0.054	0.0075	0.006	0.0149
chr4	38660905	A	G	0.67	0.073	0.008	0.02	0.016
chr4	45177547	A	G	0.57	-0.234	0.0075	0.014	0.0149
chr4	53273193	T	C	0.47	0.046	0.0077	-0.005	0.0152
chr4	55500226	C	A	0.72	0.074	0.0085	-0.008	0.0167
chr4	58791653	A	G	0.27	0.05	0.0086	0.009	0.0169
chr4	60224601	T	G	0.3	-0.096	0.0082	-0.008	0.0162
chr4	61425025	T	C	0.08	0.098	0.0135	-0.008	0.0269
chr4	67891641	T	C	0.51	-0.064	0.0075	0.008	0.0149
chr4	77030872	G	A	0.78	-0.062	0.009	-0.008	0.018
chr4	84980656	A	G	0.58	-0.048	0.0077	0.002	0.0152
chr4	95103519	A	G	0.47	-0.089	0.0076	-0.002	0.015
chr4	112721069	T	C	0.66	0.075	0.0079	-0.025	0.0156
chr4	118254375	G	C	0.79	0.056	0.0092	0.008	0.0181
chr4	120289396	T	C	0.67	-0.063	0.0083	-0.008	0.0162
chr4	124045441	T	C	0.78	-0.065	0.0091	0	0.0179
chr4	130746149	C	A	0.64	-0.113	0.0078	0.003	0.0155
chr4	137083193	C	A	0.55	-0.095	0.0076	-0.014	0.0151
chr4	139855476	T	C	0.61	0.046	0.0077	-0.005	0.0152
chr4	143732619	T	G	0.6	-0.07	0.0078	-0.001	0.0154
chr4	145574196	G	A	0.13	0.078	0.0111	-0.029	0.0223
chr4	151218297	A	G	0.35	0.062	0.0078	0.004	0.0155
chr4	152109242	T	C	0.06	0.09	0.0156	0.021	0.0305
chr4	152835320	T	G	0.73	0.075	0.0084	0.009	0.0167

chr4	154386317	G	A	0.65	0.052	0.0079	-0.002	0.0156
chr4	159861711	A	G	0.64	-0.055	0.0079	0.011	0.0157
chr4	162121944	A	G	0.38	0.049	0.0079	-0.014	0.0156
chr4	162876015	T	C	0.82	0.058	0.0099	0.013	0.0196
chr4	164265052	G	A	0.97	0.175	0.0271	0.028	0.0548
chr4	166233579	A	G	0.33	0.055	0.0085	0.005	0.0168
chr4	167648719	G	A	0.58	0.059	0.0076	0.001	0.0151
chr4	171338717	T	G	0.79	0.075	0.0094	-0.01	0.0184
chr4	179339331	G	C	0.42	-0.057	0.0076	-0.014	0.0151
chr4	190685480	G	A	0.61	0.052	0.0077	0.015	0.0152
chr5	3223420	G	A	0.6	-0.065	0.0078	0.017	0.0154
chr5	7445712	C	A	0.72	0.062	0.0091	-0.01	0.0175
chr5	9825952	C	A	0.4	0.061	0.0084	-0.005	0.0161
chr5	11935729	G	A	0.59	-0.05	0.0077	-0.011	0.0151
chr5	18287173	A	G	0.58	0.045	0.0078	0.013	0.0154
chr5	19957695	T	C	0.64	0.056	0.0078	-0.001	0.0154
chr5	24111889	G	A	0.66	-0.046	0.0079	0.007	0.0156
chr5	26125579	G	A	0.93	-0.11	0.0155	-0.019	0.0304
chr5	30078281	G	A	0.49	-0.049	0.0075	0.011	0.0149
chr5	32763846	G	A	0.7	0.068	0.0081	-0.003	0.016
chr5	38263127	C	A	0.61	-0.053	0.0077	-0.01	0.0152
chr5	43152216	T	C	0.31	-0.092	0.0081	-0.025	0.0161
chr5	50352482	T	C	0.13	0.088	0.0111	-0.017	0.022
chr5	54952688	A	G	0.35	-0.046	0.008	0	0.0159
chr5	56206529	T	C	0.73	-0.058	0.0085	0.006	0.0169
chr5	60716743	A	G	0.34	-0.097	0.0082	-0.003	0.0161
chr5	63019432	T	A	0.71	-0.099	0.0083	0.019	0.0165
chr5	66185151	T	C	0.72	0.093	0.0084	-0.017	0.0165
chr5	68363400	A	G	0.46	-0.043	0.0078	-0.014	0.0154
chr5	71828874	T	C	0.76	-0.055	0.0088	-0.006	0.0174
chr5	75003678	T	C	0.6	0.112	0.0076	-0.007	0.0151
chr5	76607627	A	G	0.51	-0.063	0.0075	0.026	0.0149
chr5	81077571	C	A	0.87	0.103	0.0114	-0.023	0.0223
chr5	92376460	T	A	0.35	-0.088	0.0079	-0.001	0.0158
chr5	94197477	T	C	0.76	-0.064	0.0094	0.005	0.0186
chr5	95859144	T	C	0.59	-0.077	0.0076	-0.022	0.0151
chr5	100959915	T	C	0.61	-0.052	0.0077	0.013	0.0153
chr5	103914523	T	C	0.62	0.07	0.0077	0.026	0.0153
chr5	107502872	T	C	0.81	0.1	0.0096	-0.007	0.019
chr5	108731701	A	G	0.58	0.086	0.0077	-0.009	0.0152
chr5	111285955	G	C	0.33	0.05	0.008	-0.008	0.0159
chr5	115816513	T	G	0.83	0.081	0.0099	0.002	0.0196
chr5	116961844	G	A	0.36	-0.052	0.0078	0.004	0.0154

chr5	118726662	T	C	0.72	-0.054	0.0084	0.001	0.0167
chr5	120330279	G	A	0.95	-0.092	0.0167	-0.008	0.0335
chr5	122727171	T	G	0.71	-0.076	0.0083	-0.001	0.0163
chr5	133856358	A	G	0.57	0.094	0.0076	0.014	0.0151
chr5	139057548	G	A	0.35	0.106	0.008	-0.004	0.0158
chr5	144485978	G	A	0.69	-0.069	0.0081	0.003	0.0161
chr5	147996888	T	C	0.33	-0.073	0.0079	-0.001	0.0157
chr5	149171889	G	C	0.2	-0.054	0.0095	0.001	0.0187
chr5	152276274	A	G	0.62	0.065	0.0079	-0.016	0.0156
chr5	153517178	G	C	0.56	-0.101	0.0075	0.016	0.0149
chr5	155612859	A	G	0.42	0.053	0.0084	-0.01	0.0165
chr5	158409804	T	A	0.49	-0.094	0.0075	-0.023	0.0149
chr5	161382474	T	A	0.39	-0.058	0.0077	-0.012	0.0153
chr5	163461863	A	G	0.87	-0.09	0.011	-0.007	0.0221
chr5	164512231	A	G	0.45	0.082	0.0077	-0.006	0.0152
chr5	170623391	G	A	0.68	0.101	0.008	-0.01	0.0159
chr6	396321	T	C	0.17	0.088	0.0102	-0.006	0.0202
chr6	5389386	A	G	0.2	-0.081	0.0093	-0.01	0.0184
chr6	12150800	T	A	0.34	-0.096	0.008	0.012	0.0158
chr6	21921706	C	A	0.68	-0.067	0.008	0.018	0.0159
chr6	23443237	G	A	0.26	0.062	0.0088	0.015	0.0172
chr6	38455193	T	C	0.24	0.06	0.0088	-0.014	0.0175
chr6	40362023	T	C	0.57	-0.106	0.0075	0.045	0.015
chr6	46306547	T	C	0.49	-0.062	0.0076	0.011	0.015
chr6	50788778	C	A	0.18	0.257	0.0097	0.007	0.0192
chr6	55190480	G	A	0.84	-0.097	0.0104	-0.027	0.0204
chr6	64191578	T	A	0.53	0.053	0.0078	0.019	0.0155
chr6	69828347	A	G	0.57	-0.072	0.0076	0.013	0.0152
chr6	71363743	A	G	0.54	-0.05	0.0077	0.001	0.0152
chr6	73744033	T	C	0.28	0.08	0.0085	0.005	0.0169
chr6	76267792	A	G	0.49	-0.044	0.0075	0.004	0.0149
chr6	78174209	T	C	0.14	0.077	0.0109	-0.022	0.0219
chr6	80116447	G	A	0.75	0.064	0.0086	0.003	0.017
chr6	83534729	T	A	0.69	-0.053	0.0081	0.003	0.0161
chr6	86406671	T	C	0.3	0.069	0.0082	0	0.0163
chr6	90322237	G	A	0.05	0.102	0.0168	-0.002	0.0331
chr6	92011531	T	C	0.93	-0.134	0.0144	-0.011	0.0285
chr6	93628917	T	A	0.54	0.052	0.0076	-0.002	0.015
chr6	97385640	T	C	0.66	0.097	0.0079	0.001	0.0158
chr6	100914602	T	C	0.55	0.051	0.0075	0.009	0.0149
chr6	108926496	G	A	0.62	0.121	0.0077	0.03	0.0154
chr6	111889789	T	C	0.78	0.065	0.0091	0.011	0.018
chr6	112739106	G	A	0.51	0.047	0.0075	-0.002	0.0149

chr6	120170293	T	C	0.35	-0.079	0.0079	-0.028	0.0156
chr6	123324738	A	G	0.67	0.053	0.0079	0.003	0.0157
chr6	126703390	T	A	0.54	0.063	0.0076	-0.011	0.0151
chr6	130386213	A	G	0.33	0.064	0.0081	-0.003	0.0159
chr6	131917379	G	A	0.15	0.073	0.0104	0.011	0.0207
chr6	137666397	G	A	0.82	-0.078	0.0097	-0.004	0.0193
chr6	141535315	T	A	0.37	0.084	0.0078	0.028	0.0155
chr6	147358193	T	C	0.51	0.065	0.0076	-0.016	0.015
chr6	150562480	T	C	0.3	-0.056	0.0086	-0.021	0.0171
chr6	151947631	T	C	0.37	-0.046	0.0078	-0.013	0.0154
chr6	153392908	T	C	0.7	-0.125	0.0082	0.009	0.0162
chr6	154335719	T	A	0.14	0.081	0.0106	0.033	0.021
chr6	155832956	G	A	0.54	0.047	0.0076	-0.018	0.0149
chr6	158877634	G	A	0.66	-0.059	0.0081	-0.014	0.0159
chr7	5548239	A	G	0.11	0.098	0.0124	-0.001	0.0245
chr7	6600551	T	C	0.44	-0.08	0.0077	0.006	0.0152
chr7	10052649	A	G	0.5	0.049	0.0075	-0.002	0.0149
chr7	11874611	A	G	0.7	0.098	0.0083	-0.018	0.0165
chr7	20140625	G	A	0.52	-0.044	0.0075	-0.01	0.0148
chr7	21499828	G	A	0.39	0.071	0.0077	-0.01	0.0153
chr7	22418339	T	A	0.65	0.055	0.0083	0.001	0.0161
chr7	27091507	G	A	0.87	-0.108	0.0117	0.016	0.023
chr7	28196222	G	A	0.5	0.064	0.0075	-0.011	0.0148
chr7	30182444	G	A	0.66	-0.046	0.0081	0.002	0.0158
chr7	31129038	A	G	0.57	0.044	0.0078	0.006	0.0155
chr7	32339594	G	A	0.22	0.076	0.0089	0.026	0.0176
chr7	39436256	G	A	0.34	-0.079	0.0079	-0.018	0.0156
chr7	42860377	T	A	0.93	0.1	0.0158	-0.002	0.0307
chr7	49616420	G	A	0.39	0.085	0.0077	-0.017	0.0152
chr7	50544961	G	A	0.55	0.1	0.0076	-0.011	0.015
chr7	52555794	G	A	0.15	0.061	0.011	0.025	0.0217
chr7	54673545	G	A	0.84	-0.058	0.0103	0.004	0.0206
chr7	67188108	G	C	0.63	-0.052	0.0078	0.006	0.0154
chr7	90955589	A	G	0.62	0.058	0.0081	-0.01	0.0157
chr7	95170270	G	C	0.65	-0.051	0.0079	0.005	0.0157
chr7	99025607	G	C	0.85	0.083	0.0109	0.004	0.0216
chr7	103417139	C	A	0.43	0.082	0.0076	-0.013	0.0151
chr7	105277793	T	C	0.65	0.057	0.0079	0.003	0.0156
chr7	111356819	G	A	0.34	0.096	0.0079	0.012	0.0157
chr7	112118005	G	A	0.68	-0.049	0.008	0.011	0.0159
chr7	113028634	T	A	0.57	0.097	0.0077	0.001	0.0152
chr7	115853503	C	A	0.57	-0.06	0.0075	-0.011	0.015
chr7	124267810	A	G	0.78	0.063	0.0092	0.023	0.0183

chr7	127831580	G	A	0.58	-0.059	0.0079	0.008	0.0154
chr7	130449195	A	G	0.65	0.063	0.0088	0.013	0.0174
chr7	137426568	T	C	0.36	0.061	0.0079	-0.004	0.0156
chr7	138817193	T	C	0.91	0.123	0.0129	-0.006	0.0259
chr7	140046927	G	C	0.61	0.048	0.0079	-0.02	0.0155
chr7	150072241	T	C	0.29	-0.058	0.0085	0.004	0.0169
chr7	157967843	T	C	0.14	-0.083	0.0111	-0.022	0.022
chr8	1090349	G	C	0.89	-0.073	0.0124	0.03	0.0247
chr8	4302290	G	C	0.12	0.097	0.0121	-0.021	0.0239
chr8	10754276	A	G	0.46	0.097	0.0075	0.011	0.015
chr8	12573500	C	A	0.12	0.065	0.0116	-0.001	0.0232
chr8	14070774	G	C	0.66	-0.086	0.008	-0.013	0.0159
chr8	16217465	T	C	0.19	-0.061	0.0098	-0.016	0.0193
chr8	17062193	G	A	0.77	0.086	0.009	-0.008	0.0176
chr8	19553497	T	C	0.5	0.043	0.0075	-0.016	0.0148
chr8	25579316	G	C	0.71	-0.062	0.0088	-0.004	0.0175
chr8	28052093	T	C	0.18	0.112	0.0103	-0.033	0.0208
chr8	30861249	G	A	0.53	0.101	0.0076	0.002	0.015
chr8	34363461	A	G	0.63	0.056	0.0079	0.01	0.0157
chr8	38328302	G	A	0.4	0.053	0.0076	-0.022	0.0151
chr8	42442067	G	A	0.49	-0.046	0.0075	-0.016	0.0148
chr8	50815776	C	A	0.84	0.065	0.0101	0.002	0.02
chr8	53131574	T	C	0.83	0.061	0.01	-0.008	0.0198
chr8	54283820	T	C	0.91	-0.072	0.0131	0.001	0.0259
chr8	56290486	T	C	0.85	0.089	0.0106	-0.001	0.0208
chr8	57421575	T	C	0.27	0.058	0.0084	0.011	0.0168
chr8	60667640	T	A	0.4	-0.07	0.0077	-0.021	0.0152
chr8	62165340	T	C	0.55	-0.066	0.0075	0.015	0.015
chr8	64676949	A	G	0.32	0.082	0.0081	0.009	0.0159
chr8	71055357	G	A	0.93	0.105	0.0147	0.038	0.0297
chr8	73436094	G	A	0.58	-0.085	0.0076	0.002	0.015
chr8	76811031	G	C	0.37	-0.12	0.0078	0.018	0.0153
chr8	80162092	C	A	0.85	-0.069	0.0105	0.008	0.0208
chr8	81375457	T	C	0.11	-0.112	0.012	0.021	0.0238
chr8	85097067	G	C	0.74	0.08	0.0086	0.011	0.0172
chr8	88590204	C	A	0.67	-0.068	0.008	0.004	0.0158
chr8	93255789	G	C	0.34	-0.075	0.0081	-0.002	0.0159
chr8	95548751	T	C	0.25	-0.108	0.0087	0	0.0172
chr8	97935923	T	C	0.9	-0.085	0.0128	0.017	0.0257
chr8	101937374	G	A	0.61	0.064	0.0078	0	0.0154
chr8	103637946	A	G	0.47	-0.048	0.0077	-0.007	0.0152
chr8	104936546	T	C	0.26	-0.077	0.0087	0.014	0.017
chr8	113669420	T	C	0.82	-0.069	0.0098	-0.007	0.0193

chr8	116533758	G	A	0.55	-0.094	0.0076	0.028	0.0151
chr8	118882739	A	G	0.12	0.118	0.0118	-0.01	0.0233
chr8	124170259	A	G	0.34	-0.05	0.0079	0.006	0.0157
chr8	126482077	G	A	0.5	0.058	0.0075	-0.006	0.0148
chr8	130054261	T	C	0.7	-0.06	0.0082	-0.004	0.0162
chr8	131028368	C	A	0.7	-0.048	0.0082	-0.008	0.0162
chr8	135810232	A	G	0.72	0.056	0.0083	0.008	0.0166
chr8	138215228	G	A	0.93	0.134	0.0148	0	0.0294
chr8	138855111	G	A	0.22	-0.055	0.0091	-0.012	0.0182
chr8	140916457	T	C	0.11	-0.079	0.0121	0.018	0.0239
chr8	143373972	G	A	0.43	0.076	0.0076	0.008	0.015
chr9	1668272	G	A	0.35	-0.057	0.0078	0.003	0.0155
chr9	4672996	T	G	0.21	0.058	0.0095	0.009	0.0185
chr9	6963714	C	A	0.33	0.08	0.0081	-0.032	0.016
chr9	11460192	T	G	0.6	0.076	0.0077	-0.01	0.0153
chr9	12678652	G	C	0.87	0.069	0.011	-0.027	0.0216
chr9	15725282	G	A	0.44	-0.091	0.0076	0.001	0.015
chr9	18966339	T	C	0.7	0.045	0.0083	0.017	0.0164
chr9	20614309	G	C	0.72	0.057	0.0083	-0.006	0.0165
chr9	23228275	G	A	0.65	0.064	0.0079	-0.026	0.0156
chr9	25790636	T	C	0.48	0.049	0.0075	0.01	0.0149
chr9	28414625	T	C	0.31	0.144	0.0081	0.021	0.016
chr9	32364754	T	C	0.32	0.047	0.008	-0.01	0.0159
chr9	35690310	T	C	0.28	-0.05	0.0085	-0.005	0.0168
chr9	37107799	G	A	0.37	-0.103	0.0078	-0.001	0.0154
chr9	72183218	T	C	0.65	0.05	0.0079	-0.012	0.0156
chr9	73785947	A	G	0.41	0.086	0.0077	-0.028	0.0152
chr9	79321871	T	C	0.64	0.049	0.0078	-0.002	0.0154
chr9	86714158	A	G	0.48	0.067	0.0075	0.009	0.015
chr9	92213923	T	G	0.5	-0.07	0.0075	-0.002	0.0149
chr9	94104340	G	A	0.09	-0.095	0.0138	-0.011	0.0273
chr9	96445803	G	A	0.74	0.08	0.0085	-0.005	0.0169
chr9	98270646	A	G	0.23	-0.056	0.009	-0.014	0.0179
chr9	103904576	G	A	0.54	-0.069	0.0075	-0.011	0.0149
chr9	107722705	T	C	0.47	-0.055	0.0077	0.01	0.0153
chr9	115034356	T	A	0.55	-0.055	0.0077	0.011	0.0153
chr9	116533020	T	C	0.37	-0.077	0.0078	-0.001	0.0154
chr9	120404878	T	C	0.36	-0.099	0.0079	-0.008	0.0156
chr9	124618386	T	C	0.4	0.069	0.0077	-0.01	0.0153
chr9	129408513	G	A	0.61	-0.12	0.0077	0.031	0.0153
chr9	133783566	G	A	0.59	-0.095	0.0076	0.006	0.0151
chr9	134803855	G	A	0.28	-0.054	0.0085	-0.013	0.0168
chr9	137989785	G	C	0.14	0.094	0.0111	-0.008	0.022



chr9	139427910	T	C	0.38	-0.043	0.0078	-0.015	0.0154
chr9	140253788	T	C	0.83	0.131	0.012	-0.004	0.0289
chr10	2666834	G	A	0.52	-0.084	0.0075	-0.006	0.0149
chr10	5481570	G	A	0.29	0.048	0.0082	0.013	0.0163
chr10	14671520	T	A	0.33	0.053	0.008	-0.007	0.0159
chr10	16074553	G	A	0.24	-0.079	0.0088	0.034	0.0173
chr10	17625227	G	A	0.57	0.045	0.0076	0.002	0.015
chr10	18573654	G	A	0.23	-0.072	0.0089	0.026	0.0175
chr10	21821274	G	A	0.66	-0.104	0.008	0.035	0.0159
chr10	27291866	A	G	0.14	0.099	0.0108	0.002	0.0213
chr10	33862727	G	A	0.56	0.075	0.0076	0.007	0.015
chr10	53639932	T	C	0.31	0.056	0.0083	0.018	0.0162
chr10	56320350	T	G	0.48	-0.059	0.0075	0.009	0.0149
chr10	63295034	T	C	0.07	-0.115	0.015	0.018	0.0293
chr10	65191645	T	G	0.51	-0.072	0.0075	0.004	0.0148
chr10	67780663	T	C	0.52	-0.052	0.0075	0.013	0.0149
chr10	70626170	T	C	0.04	0.114	0.0187	0.026	0.0369
chr10	78772614	T	C	0.44	0.043	0.0077	-0.006	0.0151
chr10	81034913	G	C	0.52	-0.062	0.0075	-0.026	0.0148
chr10	82283160	A	G	0.26	0.063	0.0088	-0.01	0.0175
chr10	87444021	C	A	0.95	-0.249	0.0179	0.021	0.0355
chr10	92990910	T	C	0.62	0.06	0.0079	-0.023	0.0156
chr10	99703805	T	C	0.43	0.08	0.0077	-0.002	0.0151
chr10	102447647	C	A	0.91	0.197	0.0136	-0.027	0.0264
chr10	109500597	T	G	0.6	-0.053	0.0078	-0.006	0.0154
chr10	112792736	G	C	0.71	0.05	0.0084	0.011	0.0166
chr10	114758349	T	C	0.29	-0.148	0.0082	-0.025	0.0164
chr10	117510880	T	G	0.24	0.061	0.0088	-0.006	0.0175
chr10	118780025	C	A	0.81	-0.09	0.0099	-0.034	0.0197
chr10	122061612	G	A	0.36	0.097	0.008	-0.03	0.0157
chr10	123578337	T	C	0.62	0.053	0.0077	-0.014	0.0153
chr10	124951679	G	A	0.89	0.113	0.0124	-0.022	0.0242
chr10	126650696	G	A	0.33	0.097	0.0079	0	0.0157
chr10	129148531	A	G	0.51	-0.054	0.0082	-0.02	0.0162
chr10	129803356	T	C	0.9	-0.075	0.0125	0.024	0.0246
chr10	132943709	G	A	0.2	-0.083	0.0094	0.006	0.0185
chr10	134955720	T	C	0.76	-0.08	0.0093	-0.007	0.0182
chr11	2199686	G	A	0.8	-0.073	0.0095	-0.027	0.0186
chr11	3020782	G	A	0.71	0.059	0.0082	0.005	0.0163
chr11	6239344	G	A	0.44	0.063	0.0077	0.02	0.0158
chr11	7281518	G	A	0.13	-0.066	0.0115	-0.02	0.0228
chr11	8677185	T	C	0.64	0.116	0.0079	-0.012	0.0155
chr11	11856492	G	C	0.88	0.086	0.0117	-0.015	0.0229

chr11	13345593	G	A	0.63	0.08	0.0078	0.008	0.0154
chr11	16683176	T	C	0.21	0.1	0.0092	-0.028	0.0184
chr11	18333058	T	A	0.31	0.062	0.0098	0.011	0.0192
chr11	20959004	T	C	0.05	0.144	0.0166	0.013	0.0329
chr11	27730556	G	A	0.21	-0.205	0.0092	0.037	0.018
chr11	33755956	T	C	0.23	-0.062	0.0089	0.002	0.0177
chr11	36806203	G	A	0.43	0.056	0.0075	0.019	0.0149
chr11	38572454	T	C	0.35	0.052	0.0078	0.001	0.0155
chr11	43868651	T	C	0.31	0.085	0.0081	0.001	0.016
chr11	60831596	T	A	0.83	-0.061	0.0103	-0.02	0.0202
chr11	69494340	C	A	0.35	-0.102	0.008	0.004	0.0157
chr11	70290973	A	G	0.79	-0.061	0.0096	-0.001	0.0189
chr11	72462375	T	C	0.77	-0.096	0.0089	0.022	0.0178
chr11	76466188	G	A	0.77	0.077	0.0091	-0.021	0.0177
chr11	80018030	G	A	0.91	-0.09	0.0132	-0.02	0.0262
chr11	84776849	G	A	0.5	0.058	0.0075	0.02	0.0149
chr11	89315132	C	A	0.65	0.1	0.0083	0.005	0.0162
chr11	96127385	T	C	0.59	-0.042	0.0076	-0.015	0.0151
chr11	103026041	A	G	0.18	-0.075	0.0101	0.005	0.0199
chr11	109357926	G	A	0.7	-0.063	0.0083	-0.008	0.0163
chr11	111029084	T	C	0.84	-0.077	0.0102	-0.014	0.0202
chr11	115044850	C	A	0.58	0.121	0.0076	0.014	0.0151
chr11	125442677	G	A	0.83	-0.069	0.01	0.014	0.0199
chr11	129309511	T	A	0.29	0.069	0.0084	-0.023	0.0166
chr11	130749352	A	G	0.46	-0.089	0.0076	0.018	0.015
chr11	132704269	G	A	0.59	-0.081	0.0076	-0.016	0.015
chr12	939480	T	G	0.21	0.146	0.0094	0.022	0.0185
chr12	6681821	A	G	0.83	-0.062	0.0101	-0.008	0.0198
chr12	17220862	A	G	0.49	-0.067	0.0076	0.011	0.015
chr12	24059999	T	C	0.87	-0.108	0.0113	0.007	0.0222
chr12	25813696	T	G	0.64	-0.051	0.0078	0.011	0.0156
chr12	26457650	T	A	0.22	-0.065	0.009	-0.006	0.0179
chr12	28417500	A	G	0.71	-0.066	0.0084	-0.023	0.0167
chr12	31798982	A	G	0.84	-0.075	0.0107	-0.02	0.0209
chr12	39424076	T	C	0.57	-0.1	0.0076	0	0.015
chr12	41838482	G	C	0.47	0.077	0.0076	-0.025	0.0151
chr12	50263148	G	A	0.61	-0.245	0.0077	0.011	0.0152
chr12	54635846	T	G	0.39	-0.07	0.0077	-0.023	0.0153
chr12	56494428	A	G	0.41	-0.071	0.0077	0.03	0.0153
chr12	59831308	T	C	0.69	-0.049	0.0081	0.011	0.0161
chr12	62195848	G	A	0.46	0.056	0.0075	-0.003	0.0149
chr12	65796310	T	A	0.78	0.06	0.0093	0.009	0.0183
chr12	68205604	G	A	0.83	-0.1	0.0099	0.015	0.0197

chr12	70755656	G	A	0.86	-0.096	0.0108	0.032	0.0218
chr12	73537193	T	C	0.44	-0.048	0.0076	0.007	0.0149
chr12	82145193	A	G	0.67	-0.05	0.0083	-0.01	0.0164
chr12	85733646	G	A	0.19	-0.071	0.0098	0.028	0.019
chr12	89748584	A	G	0.46	0.077	0.0075	0.019	0.0149
chr12	94538395	T	A	0.3	0.05	0.0084	0.008	0.0165
chr12	95921261	G	C	0.46	-0.069	0.0075	-0.006	0.0149
chr12	97792690	T	C	0.52	-0.056	0.0076	-0.004	0.015
chr12	99560183	G	A	0.62	-0.088	0.0078	-0.006	0.0154
chr12	100256615	T	G	0.07	0.102	0.015	0.04	0.0291
chr12	107712028	T	C	0.3	0.072	0.0082	-0.005	0.0162
chr12	109937534	G	A	0.46	-0.091	0.0075	0.018	0.0148
chr12	112059557	T	C	0.45	-0.073	0.0077	0.002	0.0152
chr12	117605339	G	C	0.57	-0.052	0.0076	-0.003	0.015
chr12	122603392	A	G	0.44	0.083	0.0082	-0.011	0.0163
chr12	128724922	C	A	0.77	0.053	0.0093	-0.022	0.0182
chr13	28022914	T	C	0.27	-0.124	0.0086	0.003	0.0171
chr13	34614325	G	A	0.5	-0.045	0.0075	-0.007	0.0148
chr13	36630794	C	A	0.62	-0.044	0.0077	-0.004	0.0153
chr13	40779354	A	G	0.57	-0.065	0.0077	-0.001	0.0153
chr13	45609089	A	G	0.14	-0.075	0.0114	0.008	0.0223
chr13	50474950	A	G	0.05	-0.135	0.0175	0.03	0.0344
chr13	51926359	G	A	0.56	0.048	0.0075	0.015	0.015
chr13	54107352	G	A	0.87	-0.198	0.0113	0.022	0.0223
chr13	60557270	A	G	0.45	0.056	0.0078	0.004	0.0154
chr13	62910346	T	G	0.66	-0.057	0.0079	-0.006	0.0157
chr13	63734335	G	A	0.96	-0.111	0.0194	-0.029	0.0373
chr13	66204127	A	G	0.59	-0.121	0.0076	0.005	0.0152
chr13	72636849	G	C	0.17	0.064	0.01	0.012	0.0198
chr13	76386295	A	G	0.25	0.068	0.0087	0.005	0.0171
chr13	79580675	A	G	0.61	0.113	0.0077	0.004	0.0154
chr13	83710266	T	C	0.74	-0.047	0.0086	0.014	0.0171
chr13	85915002	T	C	0.38	-0.056	0.0077	-0.021	0.0153
chr13	89131240	G	A	0.48	-0.065	0.0075	-0.006	0.0149
chr13	91974556	G	A	0.1	-0.073	0.0125	-0.016	0.0249
chr13	92873974	A	G	0.26	-0.05	0.0086	0.006	0.0171
chr13	95054345	G	C	0.49	-0.056	0.0076	-0.006	0.015
chr13	97047020	G	A	0.54	-0.096	0.0076	0.004	0.015
chr13	99113230	C	A	0.29	-0.1	0.0083	0.015	0.0164
chr13	100549885	G	A	0.22	0.082	0.0091	0.01	0.018
chr13	101701764	G	C	0.22	0.08	0.009	0	0.0179
chr13	105794259	A	G	0.67	-0.051	0.008	0.009	0.0158
chr13	107182436	T	C	0.51	0.046	0.0076	0.015	0.0151

chr13	107884363	T	C	0.59	0.063	0.0076	-0.012	0.015
chr13	109666851	G	A	0.2	-0.073	0.0101	-0.005	0.0195
chr13	111969728	T	C	0.64	-0.083	0.0079	-0.012	0.0157
chr14	21097971	T	C	0.1	0.075	0.0124	-0.014	0.0249
chr14	25932585	G	A	0.67	0.12	0.008	0.018	0.0158
chr14	27631535	T	G	0.54	0.047	0.0076	-0.019	0.0149
chr14	29683174	A	G	0.23	-0.132	0.0089	-0.044	0.0177
chr14	31583512	T	C	0.11	0.124	0.0122	0.032	0.0237
chr14	33298732	A	G	0.54	-0.115	0.0075	0.003	0.0149
chr14	35871093	T	C	0.38	-0.043	0.0077	0.015	0.0152
chr14	40834177	T	C	0.17	-0.079	0.0101	0.033	0.02
chr14	42696672	G	C	0.73	-0.052	0.0085	-0.016	0.0168
chr14	47309879	G	A	0.49	-0.071	0.0075	0.021	0.0149
chr14	53276951	C	A	0.51	0.049	0.0075	-0.002	0.0149
chr14	65042373	A	G	0.68	0.066	0.0082	-0.026	0.0162
chr14	67984737	T	G	0.51	-0.044	0.0075	0.015	0.0149
chr14	69795199	G	A	0.61	0.071	0.0077	0.016	0.0153
chr14	73348130	G	A	0.46	0.08	0.0077	-0.032	0.0151
chr14	79899454	T	C	0.53	0.105	0.0075	-0.022	0.0148
chr14	85744404	A	G	0.59	-0.044	0.0079	-0.013	0.0156
chr14	88362432	T	C	0.77	-0.083	0.009	0.002	0.0178
chr14	91505368	G	A	0.72	0.116	0.0084	0.002	0.0166
chr14	94005558	A	G	0.62	0.114	0.0078	0.035	0.0154
chr14	95898607	G	A	0.26	0.051	0.0085	0.006	0.017
chr14	97258065	G	A	0.06	0.097	0.0153	0.002	0.0305
chr14	99692254	T	C	0.56	0.062	0.0076	0.006	0.0151
chr14	101529005	G	A	0.65	-0.122	0.0093	0.002	0.0185
chr15	29853387	T	C	0.88	-0.068	0.0115	0.024	0.0229
chr15	31798644	T	A	0.07	0.092	0.0147	0.016	0.0292
chr15	38850330	T	C	0.73	-0.072	0.0085	0.016	0.0169
chr15	53158019	T	C	0.16	0.104	0.0102	-0.02	0.0202
chr15	59460768	T	C	0.89	0.09	0.0119	0.009	0.0236
chr15	60298566	A	G	0.24	-0.054	0.0088	0.022	0.0173
chr15	60923087	A	G	0.45	0.078	0.0077	0.004	0.0151
chr15	68072458	T	C	0.77	0.169	0.0089	-0.004	0.0175
chr15	74348069	A	G	0.19	0.115	0.0099	-0.019	0.0198
chr15	78093137	T	C	0.96	0.153	0.0196	0.014	0.0388
chr15	81025755	G	A	0.35	-0.086	0.0078	-0.007	0.0155
chr15	85553781	G	A	0.18	-0.056	0.0098	0.009	0.0193
chr15	90568960	G	A	0.59	-0.046	0.008	0.015	0.0156
chr15	91985356	A	G	0.5	0.051	0.0075	0.006	0.0149
chr15	95277260	T	C	0.52	-0.066	0.0077	0.004	0.0152
chr15	99276257	G	C	0.32	0.059	0.008	-0.005	0.0159

chr16	12105523	T	A	0.4	0.053	0.0077	-0.019	0.0153
chr16	14398169	A	G	0.41	0.07	0.008	0.015	0.0158
chr16	16974936	T	C	0.58	0.055	0.0076	-0.017	0.015
chr16	20257273	G	A	0.12	-0.187	0.0117	0.006	0.0231
chr16	24793432	T	C	0.19	-0.133	0.0095	-0.014	0.019
chr16	28883241	G	A	0.38	0.185	0.0077	-0.05	0.0154
chr16	49068587	G	A	0.37	0.086	0.0078	-0.002	0.0154
chr16	53802494	T	C	0.41	0.506	0.0076	-0.001	0.0151
chr16	61716703	G	A	0.85	0.082	0.0104	0.01	0.0207
chr16	63124867	G	A	0.76	-0.065	0.0088	-0.011	0.0174
chr16	69582018	A	G	0.58	0.128	0.0076	-0.026	0.0151
chr16	76735381	T	C	0.8	-0.067	0.0095	0.017	0.0189
chr16	79625567	G	C	0.23	0.058	0.0091	-0.007	0.018
chr16	81738439	T	A	0.42	0.082	0.0077	0.018	0.0151
chr16	84018006	G	A	0.96	0.126	0.0211	0.024	0.0412
chr16	85302471	A	G	0.13	0.075	0.012	0.026	0.0235
chr16	89887249	G	A	0.76	-0.077	0.0089	-0.032	0.0175
chr17	1843189	C	A	0.82	0.123	0.0098	0.016	0.0194
chr17	3985864	G	A	0.68	-0.057	0.0082	0.012	0.0161
chr17	5317492	C	A	0.7	-0.095	0.0082	-0.021	0.0161
chr17	6473283	G	A	0.89	-0.1	0.0127	0.012	0.025
chr17	10219366	T	C	0.78	0.065	0.0091	0.004	0.0181
chr17	13744428	G	A	0.39	0.046	0.0077	-0.004	0.0152
chr17	19220666	G	A	0.18	0.106	0.0097	0.004	0.0192
chr17	31465704	T	C	0.28	-0.06	0.0084	0.017	0.0166
chr17	34907051	A	G	0.56	0.143	0.0079	0.032	0.0158
chr17	52061614	G	A	0.56	0.048	0.0076	-0.004	0.015
chr17	53479340	A	G	0.55	0.048	0.0075	-0.018	0.0149
chr17	54086346	G	A	0.19	0.054	0.0096	-0.003	0.0191
chr17	55498377	T	C	0.05	-0.159	0.0173	0.024	0.034
chr17	59491384	G	A	0.67	0.059	0.0079	-0.025	0.0157
chr17	63906955	A	G	0.07	-0.099	0.0151	-0.004	0.0297
chr17	65387265	A	G	0.24	-0.094	0.0088	0.007	0.0174
chr17	68431026	T	C	0.53	0.074	0.0075	-0.023	0.0149
chr17	74702510	G	A	0.85	-0.066	0.0107	0.023	0.0214
chr17	78757626	G	A	0.31	-0.141	0.0083	0.021	0.0162
chr18	1839339	T	C	0.15	0.16	0.0107	-0.027	0.0213
chr18	3984799	T	G	0.51	0.065	0.0076	0.003	0.0151
chr18	9173620	A	G	0.72	0.066	0.0085	0.022	0.0169
chr18	11993175	T	C	0.24	0.051	0.0089	0.011	0.0174
chr18	12843137	T	C	0.84	0.061	0.0103	-0.006	0.0204
chr18	21097460	G	A	0.48	-0.116	0.0075	0.018	0.0149
chr18	25041321	A	G	0.58	-0.051	0.0081	-0.006	0.0159

chr18	27560370	G	A	0.51	0.041	0.0075	-0.015	0.0148
chr18	31248392	A	G	0.53	-0.072	0.0076	-0.025	0.015
chr18	34967289	G	A	0.9	0.104	0.0131	0.006	0.0257
chr18	39935999	A	G	0.34	0.1	0.0079	-0.017	0.0158
chr18	44800515	T	A	0.44	-0.048	0.0077	-0.02	0.0152
chr18	45921214	G	A	0.46	-0.068	0.0075	0.001	0.0149
chr18	49275969	G	A	0.75	0.051	0.0087	-0.012	0.0172
chr18	52484299	T	A	0.78	-0.098	0.009	-0.007	0.0178
chr18	54811081	T	G	0.69	0.047	0.0081	0.007	0.016
chr18	57829135	T	C	0.77	-0.349	0.0088	0.015	0.0176
chr18	60788745	G	A	0.09	-0.108	0.0128	-0.026	0.0257
chr18	63439141	T	G	0.7	-0.079	0.0082	0.03	0.0163
chr18	69235390	A	G	0.38	0.078	0.0078	-0.006	0.0155
chr18	70269190	T	C	0.17	-0.056	0.0102	0.008	0.0198
chr18	71637416	T	G	0.23	0.068	0.009	0.016	0.0176
chr18	76745589	T	C	0.08	-0.109	0.0138	0.039	0.0267
chr19	6258557	T	C	0.77	0.05	0.0088	-0.013	0.0174
chr19	11270021	A	G	0.33	0.061	0.0081	0.016	0.0161
chr19	16684758	T	C	0.15	-0.066	0.0107	0.023	0.021
chr19	30293462	G	A	0.67	-0.088	0.0079	0.031	0.0158
chr19	34304260	A	G	0.68	0.112	0.0081	0.023	0.0161
chr19	41324118	G	A	0.71	-0.059	0.0093	-0.004	0.0183
chr19	46180184	T	C	0.21	-0.178	0.0092	0.029	0.018
chr19	47571938	G	A	0.33	-0.15	0.0081	-0.002	0.016
chr19	52500202	T	C	0.14	0.059	0.0107	0.014	0.0211
chr19	56146924	G	C	0.83	-0.063	0.0101	-0.001	0.0202
chr19	57187467	T	A	0.85	0.087	0.0103	0.023	0.0206
chr20	5371635	T	C	0.24	-0.058	0.009	0.006	0.0178
chr20	6630666	T	A	0.36	-0.078	0.0078	0.007	0.0154
chr20	10640960	T	C	0.07	0.083	0.0143	0.035	0.0282
chr20	11180097	A	G	0.4	-0.048	0.0078	0.003	0.0155
chr20	12418031	C	A	0.85	-0.09	0.0107	-0.032	0.0211
chr20	15809996	T	C	0.13	0.088	0.0114	-0.002	0.0224
chr20	17171373	T	G	0.72	0.09	0.0084	0.008	0.0166
chr20	21483469	T	A	0.12	0.121	0.0114	-0.024	0.0232
chr20	40140773	A	G	0.19	0.083	0.0096	0.002	0.019
chr20	41985053	A	G	0.79	0.064	0.0098	-0.004	0.0192
chr20	43427043	T	C	0.25	-0.07	0.0089	0.008	0.0175
chr20	44658544	A	G	0.53	-0.056	0.0079	0.007	0.0156
chr20	46365636	T	C	0.21	-0.076	0.0094	-0.024	0.0187
chr20	51204733	A	G	0.17	-0.156	0.0105	-0.009	0.0207
chr20	54394975	T	C	0.8	0.141	0.0094	-0.027	0.0184
chr20	58262334	G	A	0.32	0.055	0.008	-0.01	0.016

chr20	59046573	A	G	0.49	-0.043	0.0076	-0.005	0.0151
chr20	60781556	T	C	0.86	0.062	0.0108	0.009	0.0215
chr20	61560320	A	G	0.23	-0.081	0.009	-0.015	0.0178
chr21	17794297	T	G	0.84	0.056	0.0101	0.007	0.0202
chr21	19907884	T	C	0.8	-0.06	0.0095	0.008	0.0188
chr21	24357020	G	A	0.06	0.097	0.0165	0.035	0.0327
chr21	26697304	G	A	0.8	0.054	0.0094	0.007	0.0186
chr21	30575940	C	A	0.78	-0.084	0.0091	0.013	0.0182
chr21	35690499	G	A	0.38	0.064	0.0077	0.004	0.0152
chr21	38750935	G	A	0.88	0.093	0.0116	-0.032	0.0226
chr21	40310590	A	G	0.36	-0.123	0.0079	0.004	0.0156
chr21	42633065	G	A	0.68	0.074	0.008	-0.02	0.0158
chr21	46494995	T	C	0.36	0.092	0.0079	-0.011	0.0157
chr22	18173104	T	A	0.77	-0.085	0.0089	-0.018	0.0177
chr22	19948337	T	C	0.6	0.068	0.0076	-0.023	0.0151
chr22	22106535	T	C	0.85	-0.105	0.0104	-0.031	0.0204
chr22	26228758	A	G	0.35	0.049	0.0078	-0.001	0.0155
chr22	27442333	T	G	0.44	-0.06	0.0075	0.022	0.0149
chr22	33962454	T	C	0.64	0.066	0.0079	0.016	0.0156
chr22	45604800	G	A	0.57	0.071	0.0077	-0.022	0.0151
chr22	48386670	T	C	0.55	-0.081	0.008	-0.014	0.0156
chrx	1898833	A	G	0.31	-0.059	0.0086	0.013	0.0205
chrx	4804672	C	A	0.28	0.044	0.007	0.016	0.0131
chrx	9304702	T	C	0.22	-0.05	0.0075	-0.004	0.0142
chrx	11798397	C	A	0.18	0.049	0.008	0.024	0.0151
chrx	14349349	G	C	0.56	0.041	0.0065	0.014	0.0121
chrx	21569920	G	A	0.15	-0.085	0.0087	0.028	0.016
chrx	23370768	C	A	0.35	-0.05	0.0065	0.007	0.0124
chrx	24178290	G	A	0.1	0.058	0.0103	-0.003	0.0192
chrx	41824943	T	C	0.93	-0.091	0.0129	0.015	0.0247
chrx	46615592	T	C	0.29	-0.056	0.0069	-0.008	0.013
chrx	50492754	T	G	0.97	0.27	0.024	0.027	0.0559
chrx	66499007	A	G	0.24	-0.067	0.009	-0.002	0.0169
chrx	69710924	G	A	0.44	0.07	0.0063	0.003	0.0118
chrx	77086468	A	G	0.18	0.059	0.0099	-0.018	0.0187
chrx	83471746	A	G	0.86	-0.057	0.0092	0.006	0.0172
chrx	85547556	G	A	0.41	-0.051	0.0063	-0.006	0.012
chrx	96774356	T	A	0.64	0.043	0.0067	-0.012	0.0126
chrx	102855490	T	C	0.48	-0.06	0.0062	0.021	0.0118
chrx	108303550	A	G	0.15	0.058	0.0089	0.011	0.0166
chrx	109707203	T	C	0.59	-0.051	0.0064	-0.006	0.0121
chrx	114041609	A	G	0.79	-0.054	0.0093	-0.009	0.0173
chrx	117892291	G	C	0.17	0.144	0.0083	0.012	0.0155

<b>chrX</b>	119892844	A	G	0.33	0.078	0.007	0.024	0.0131
<b>chrX</b>	128607870	T	C	0.21	0.044	0.0077	0.016	0.0145
<b>chrX</b>	131519918	A	G	0.17	-0.076	0.0104	-0.002	0.0193
<b>chrX</b>	136113464	C	A	0.49	0.07	0.0062	-0.002	0.0118
<b>chrX</b>	139381399	A	G	0.79	0.069	0.0078	0.004	0.0148



**Table 10**

Table legend: SNPs associated with BMI (cohort 2). 810 SNPs associated with BMI, 117 of which were removed by Steiger filtering. The effect of the SNPs on BMI (the exposure) and Parkinson's disease (the outcome) is shown.

Abbreviations: Chr = chromosome; BP = position in base pairs; EA = effect allele; OA = other allele; EAF = effect allele frequency; Beta = per-allele odds ratio for a 1 kg/m<sup>2</sup> increase in BMI; SE = standard error.

<b>Chr</b>	<b>BP</b>	<b>EA</b>	<b>OA</b>	<b>EAF</b>	<b>Beta (exposure)</b>	<b>SE (exposure)</b>	<b>Beta (outcome)</b>	<b>SE (outcome)</b>
chr1	2620019	C	A	0.5	0.087	0.0082	0.013	0.0165
chr1	4533115	A	G	0.28	-0.053	0.0084	-0.019	0.0168
chr1	5790073	A	G	0.33	0.055	0.0081	0.017	0.016
chr1	6684906	G	C	0.34	0.084	0.008	0.016	0.0158
chr1	10845840	G	A	0.32	0.057	0.0081	-0.007	0.0163
chr1	17311882	T	C	0.65	-0.059	0.0081	0.016	0.0161
chr1	23384756	G	A	0.17	0.124	0.01	-0.001	0.02
chr1	29039507	A	G	0.83	-0.07	0.0108	-0.005	0.0215
chr1	33889633	A	G	0.53	-0.08	0.0093	-0.014	0.0185
chr1	38047391	C	A	0.93	-0.11	0.0144	-0.008	0.0288
chr1	39571211	T	C	0.59	-0.08	0.0079	0.002	0.0155
chr1	42395396	A	G	0.52	-0.064	0.0077	0.019	0.0154
chr1	44045734	A	G	0.38	-0.056	0.0082	0.012	0.0165
chr1	45418823	A	G	0.36	-0.05	0.0082	-0.007	0.0164
chr1	46316509	A	G	0.52	-0.062	0.0077	0.013	0.0154
chr1	47696581	C	A	0.4	0.108	0.0076	0.033	0.0152
chr1	50105201	T	C	0.32	0.1	0.008	-0.008	0.016
chr1	53712727	T	C	0.4	0.042	0.0076	-0.011	0.0154
chr1	54724297	T	G	0.32	0.081	0.0088	0.007	0.0173
chr1	58288656	A	G	0.6	-0.063	0.0077	-0.017	0.0154
chr1	62579891	T	G	0.09	-0.193	0.0136	0.006	0.0275
chr1	65979280	T	C	0.91	-0.126	0.013	-0.037	0.0254
chr1	68335833	A	G	0.67	0.046	0.008	0.02	0.016
chr1	70157954	T	G	0.73	-0.048	0.0085	-0.02	0.017
chr1	72765116	G	A	0.36	-0.173	0.0078	0.007	0.0155
chr1	78450517	C	A	0.89	-0.213	0.0122	0.012	0.0253
chr1	82427833	T	C	0.76	-0.07	0.0087	-0.004	0.0175
chr1	84864256	G	C	0.65	-0.044	0.0079	0	0.0158
chr1	85901919	T	A	0.55	0.044	0.0076	0.012	0.0153
chr1	86823503	G	A	0.15	0.073	0.0106	-0.022	0.0214
chr1	91231085	C	A	0.54	0.068	0.0078	0.013	0.0155
chr1	97201140	A	G	0.7	-0.12	0.0082	-0.021	0.0164
chr1	103728254	T	C	0.13	-0.07	0.011	0.006	0.0219
chr1	106002632	T	C	0.56	-0.052	0.0075	-0.015	0.0151
chr1	112318484	G	A	0.38	-0.062	0.0079	0.022	0.0157
chr1	116484161	A	G	0.36	0.053	0.0078	-0.016	0.0157

chr1	117874155	T	C	0.36	-0.052	0.0079	0.01	0.0156
chr1	119574587	T	C	0.56	-0.071	0.0075	-0.008	0.0151
chr1	151056550	T	A	0.69	-0.127	0.0083	-0.005	0.0167
chr1	157070100	G	A	0.9	0.072	0.0125	-0.006	0.0248
chr1	166928216	T	G	0.82	-0.054	0.0097	0.003	0.0196
chr1	169335254	G	A	0.34	0.05	0.0079	-0.007	0.0158
chr1	173913374	G	C	0.12	-0.104	0.012	-0.023	0.024
chr1	177889480	G	A	0.19	0.337	0.0095	0.022	0.019
chr1	180894946	T	A	0.28	0.049	0.0083	-0.01	0.0167
chr1	181762760	G	A	0.94	-0.111	0.0167	0.03	0.0342
chr1	184254001	G	A	0.17	0.074	0.01	0.027	0.0198
chr1	187748281	C	A	0.88	-0.104	0.0118	0.006	0.0236
chr1	190306342	G	A	0.58	-0.11	0.0076	0.005	0.0152
chr1	193633707	T	C	0.52	0.056	0.0075	0.017	0.015
chr1	195025158	T	A	0.78	0.081	0.0092	-0.016	0.0182
chr1	198937443	T	C	0.19	-0.068	0.0096	-0.005	0.019
chr1	201870221	G	A	0.32	0.12	0.008	-0.012	0.0161
chr1	203517292	G	A	0.53	0.085	0.0081	-0.023	0.0194
chr1	209238377	G	C	0.36	-0.061	0.0079	-0.014	0.0158
chr1	219650561	T	C	0.47	-0.064	0.0075	-0.003	0.0149
chr1	221051792	T	C	0.19	-0.058	0.0097	0.02	0.0191
chr1	222862992	T	G	0.73	-0.067	0.0084	-0.001	0.0168
chr1	226656130	T	G	0.23	0.067	0.0089	0.008	0.0178
chr1	228946005	G	A	0.57	0.043	0.0076	-0.011	0.0152
chr1	229670573	T	C	0.21	-0.052	0.0094	0.011	0.0185
chr1	232789088	A	G	0.68	-0.051	0.008	-0.004	0.016
chr1	240396790	T	G	0.25	0.063	0.0087	0.027	0.0172
chr1	242984493	T	A	0.79	-0.088	0.0094	-0.022	0.0187
chr2	621910	C	A	0.82	0.37	0.0097	0.013	0.0195
chr2	2965080	G	A	0.79	0.056	0.0093	0.003	0.0186
chr2	4940951	A	G	0.18	-0.059	0.0099	0.002	0.0198
chr2	6157110	A	G	0.25	-0.105	0.009	-0.01	0.0179
chr2	8463495	T	C	0.55	-0.046	0.0078	-0.008	0.0154
chr2	10976827	G	A	0.31	-0.063	0.0083	-0.019	0.0166
chr2	12802029	G	C	0.09	0.082	0.0129	0.012	0.0257
chr2	15466301	T	C	0.46	-0.052	0.0076	0.01	0.0153
chr2	21415728	T	G	0.79	-0.059	0.0093	0	0.0185
chr2	22570515	T	C	0.71	0.06	0.009	-0.004	0.0177
chr2	25145173	T	A	0.53	-0.213	0.0075	0.002	0.015
chr2	29685945	T	C	0.24	-0.08	0.0087	0.032	0.0173
chr2	35429851	G	A	0.56	-0.067	0.0075	0.008	0.015
chr2	36602368	T	C	0.23	0.058	0.0089	0.005	0.0178
chr2	40293194	A	G	0.57	0.072	0.0076	0.012	0.0152

chr2	44227923	A	G	0.21	-0.061	0.0099	0.006	0.0198
chr2	46057391	G	A	0.45	0.042	0.0075	0.017	0.015
chr2	47041685	G	A	0.52	0.057	0.0076	0.004	0.015
chr2	58933591	T	C	0.56	-0.132	0.0076	0.023	0.0152
chr2	65664093	G	C	0.91	-0.11	0.0129	-0.03	0.0256
chr2	67843200	T	C	0.59	0.08	0.0076	-0.023	0.0152
chr2	73317546	G	A	0.83	0.057	0.01	0.007	0.02
chr2	77236770	C	A	0.4	-0.068	0.0076	-0.015	0.0153
chr2	79497779	G	C	0.11	0.12	0.012	-0.016	0.024
chr2	80370927	T	C	0.4	0.046	0.0076	-0.018	0.0153
chr2	86764004	T	C	0.7	-0.101	0.0082	0.014	0.0164
chr2	100895081	G	A	0.35	0.103	0.008	-0.001	0.0161
chr2	105613935	T	A	0.29	-0.074	0.0084	0.002	0.0167
chr2	113031496	A	G	0.76	-0.084	0.0091	0.018	0.018
chr2	119511191	A	G	0.82	0.076	0.0097	0.024	0.0195
chr2	121114434	T	C	0.6	0.051	0.0087	0.013	0.0172
chr2	125099894	T	A	0.6	0.057	0.0076	-0.016	0.0152
chr2	126158733	A	G	0.39	-0.046	0.0077	0.019	0.0153
chr2	128510982	G	A	0.65	0.071	0.0079	-0.015	0.0157
chr2	139876935	T	G	0.59	0.079	0.0077	-0.005	0.0153
chr2	142297868	A	G	0.82	0.093	0.0097	-0.005	0.0195
chr2	143969708	A	G	0.15	0.099	0.0106	-0.023	0.0214
chr2	147890505	A	G	0.85	-0.089	0.0105	-0.016	0.021
chr2	151320166	T	C	0.14	0.071	0.0106	-0.008	0.0214
chr2	157160967	G	C	0.57	0.067	0.0077	-0.005	0.0154
chr2	164581241	T	G	0.83	-0.085	0.01	-0.01	0.02
chr2	169506879	G	A	0.49	0.051	0.0076	0.004	0.0152
chr2	172672624	G	A	0.7	0.067	0.0082	0.001	0.0164
chr2	174958727	T	C	0.85	-0.111	0.0105	-0.001	0.0209
chr2	176646367	T	C	0.21	0.066	0.0091	-0.008	0.0182
chr2	181607676	C	A	0.67	0.112	0.008	0	0.016
chr2	185358084	T	C	0.53	0.074	0.0075	0.007	0.015
chr2	188277123	T	A	0.59	0.066	0.0077	-0.015	0.0153
chr2	190492804	G	A	0.83	-0.066	0.0102	-0.023	0.0202
chr2	193787181	G	C	0.19	-0.06	0.01	0.002	0.0199
chr2	212302127	G	A	0.32	0.093	0.008	0.031	0.016
chr2	215380524	G	C	0.39	-0.076	0.0077	0.001	0.0154
chr2	216300185	T	C	0.74	0.047	0.0085	0.012	0.0172
chr2	219671910	T	C	0.5	-0.072	0.0075	-0.011	0.0149
chr2	225274572	T	C	0.81	0.075	0.0096	0.007	0.0191
chr2	227785535	G	A	0.58	-0.061	0.0076	-0.005	0.0152
chr2	230734531	C	A	0.67	-0.079	0.0081	0.018	0.0161
chr2	241359213	A	G	0.32	-0.052	0.0081	0.005	0.0162

chr3	61228397	T	C	0.4	-0.1	0.0076	-0.009	0.0152
chr3	64702275	G	C	0.3	0.086	0.0082	-0.011	0.0165
chr3	71045288	T	C	0.83	-0.094	0.01	0.007	0.0202
chr3	74490141	T	C	0.33	0.062	0.008	0.011	0.016
chr3	77636752	G	C	0.4	0.099	0.0078	-0.015	0.0155
chr3	79820246	A	G	0.59	0.047	0.0081	-0.005	0.0161
chr3	86189861	T	C	0.69	-0.096	0.0081	0.007	0.0162
chr3	88224304	T	C	0.1	-0.112	0.0124	0.041	0.0246
chr3	93982369	T	C	0.48	0.092	0.0075	-0.029	0.0151
chr3	102329515	G	A	0.12	-0.086	0.0114	-0.02	0.0229
chr3	104611897	T	C	0.71	-0.088	0.0083	0.011	0.0166
chr3	107340246	T	C	0.83	-0.09	0.01	0.001	0.0202
chr3	109311520	A	G	0.7	0.047	0.0083	0.012	0.0165
chr3	115502481	G	A	0.13	0.081	0.0112	0.013	0.0223
chr3	117597695	T	G	0.31	0.081	0.0081	0.03	0.0161
chr3	119536429	G	A	0.24	-0.082	0.0088	0.001	0.0176
chr3	123270311	T	A	0.21	0.071	0.0092	-0.014	0.0185
chr3	131753688	T	C	0.68	-0.094	0.008	0.006	0.0161
chr3	138092747	G	A	0.19	0.122	0.0095	-0.023	0.0191
chr3	141271256	T	C	0.06	0.218	0.0152	-0.005	0.0305
chr3	147261206	T	C	0.85	-0.085	0.0105	-0.03	0.0206
chr3	154098802	C	A	0.74	-0.078	0.0087	0.015	0.0174
chr3	156351718	T	A	0.86	0.085	0.0111	-0.029	0.0217
chr3	157946921	G	A	0.5	0.053	0.0081	-0.018	0.0163
chr3	161468638	C	A	0.43	0.086	0.0076	-0.02	0.0152
chr3	166181519	T	C	0.15	-0.067	0.0105	-0.017	0.0211
chr3	168194499	T	G	0.07	0.105	0.0151	0.032	0.0297
chr3	170734438	G	A	0.29	0.08	0.0084	-0.009	0.0167
chr3	173112907	T	C	0.45	-0.083	0.0076	0.008	0.0151
chr3	178435152	G	A	0.93	-0.148	0.0147	0.046	0.0304
chr3	180462953	A	G	0.93	-0.155	0.0146	-0.004	0.0289
chr3	184056101	G	C	0.62	0.071	0.0079	0.006	0.0158
chr3	185826740	T	G	0.18	-0.195	0.0097	-0.003	0.0194
chr3	187562353	A	G	0.26	-0.078	0.0117	-0.023	0.0235
chr3	188517106	T	C	0.67	0.047	0.0079	-0.014	0.0159
chr3	193593033	T	C	0.37	-0.056	0.0078	0.022	0.0156
chr3	196115344	A	G	0.35	0.08	0.008	-0.014	0.016
chr4	6474371	T	C	0.47	0.057	0.0076	0.002	0.0151
chr4	11714923	G	A	0.28	-0.054	0.0084	-0.004	0.0168
chr4	13928923	G	C	0.24	-0.052	0.0088	0.006	0.0176
chr4	18328816	G	A	0.34	0.075	0.0082	0.023	0.0163
chr4	20530374	T	C	0.75	0.069	0.0086	-0.011	0.0172
chr4	30861964	G	A	0.67	0.097	0.008	0.012	0.0161

chr4	34927607	T	A	0.69	-0.064	0.008	-0.007	0.0162
chr4	37060360	G	A	0.17	0.087	0.0098	0.006	0.0197
chr4	38660905	A	G	0.67	0.084	0.008	-0.025	0.016
chr4	41948838	G	A	0.88	-0.083	0.0115	0.025	0.0231
chr4	45179883	T	C	0.43	0.236	0.0075	0.012	0.0151
chr4	54573278	T	C	0.18	-0.057	0.0098	-0.012	0.0197
chr4	55499386	G	C	0.47	-0.065	0.0075	0.001	0.015
chr4	60210727	C	A	0.71	0.088	0.0082	0.016	0.0165
chr4	67801134	G	A	0.42	0.079	0.0077	-0.008	0.0153
chr4	72326884	T	C	0.84	0.058	0.0102	0.008	0.0204
chr4	73549559	T	C	0.07	-0.091	0.0153	0.002	0.0305
chr4	77031424	T	A	0.6	-0.063	0.0076	0.017	0.0152
chr4	80808471	A	G	0.59	-0.063	0.0076	-0.008	0.0152
chr4	85754864	G	C	0.07	-0.1	0.015	-0.033	0.0303
chr4	95103519	A	G	0.47	-0.09	0.0076	-0.003	0.0152
chr4	112694326	T	C	0.6	0.065	0.0077	0.002	0.0154
chr4	115123570	A	G	0.29	0.059	0.0083	0.01	0.0167
chr4	116436953	G	A	0.61	0.055	0.0078	0.022	0.0156
chr4	120504227	T	C	0.29	0.069	0.0084	0.01	0.0167
chr4	123186393	G	A	0.05	-0.154	0.0172	-0.059	0.0353
chr4	124621650	T	C	0.45	-0.05	0.0077	0.019	0.0152
chr4	126916406	T	G	0.43	0.056	0.0076	0.008	0.0152
chr4	130746149	C	A	0.64	-0.103	0.0078	-0.002	0.0156
chr4	137083193	C	A	0.55	-0.095	0.0076	0.036	0.0152
chr4	140870515	T	C	0.37	-0.078	0.008	-0.028	0.0159
chr4	143231117	G	C	0.56	0.06	0.0078	-0.001	0.0155
chr4	145722862	T	A	0.36	-0.054	0.0079	0.016	0.0158
chr4	147374203	A	G	0.87	0.091	0.0144	-0.004	0.0286
chr4	151257534	T	C	0.35	0.055	0.0078	-0.004	0.0157
chr4	152840035	C	A	0.27	-0.067	0.0084	-0.026	0.0169
chr4	155948704	T	C	0.49	-0.044	0.0075	0.003	0.015
chr4	157350854	A	G	0.05	-0.105	0.019	0.006	0.0381
chr4	160596412	T	C	0.46	0.05	0.0075	0.003	0.015
chr4	162133693	T	A	0.61	-0.054	0.0077	0.011	0.0155
chr4	163107530	T	C	0.19	0.076	0.0097	-0.022	0.0195
chr4	165326244	G	A	0.69	-0.073	0.0081	0.001	0.0162
chr4	167502470	A	G	0.43	0.068	0.0077	-0.017	0.0154
chr4	172210913	G	C	0.75	0.07	0.0086	-0.003	0.0171
chr4	179338109	G	A	0.62	0.055	0.0079	0.002	0.0157
chr4	189362069	G	C	0.65	0.045	0.0079	-0.011	0.0158
chr5	3231503	G	A	0.63	-0.061	0.0078	0.004	0.0156
chr5	4247727	A	G	0.43	-0.042	0.0077	-0.002	0.0153
chr5	7516233	A	G	0.25	-0.053	0.0087	-0.011	0.0174

chr5	11860217	T	C	0.32	-0.06	0.008	-0.009	0.016
chr5	14473516	G	A	0.61	0.052	0.0077	0.003	0.0155
chr5	18298951	G	A	0.4	-0.052	0.0077	-0.006	0.0154
chr5	24244190	G	C	0.38	0.045	0.0078	-0.018	0.0157
chr5	27164046	G	C	0.07	-0.103	0.0152	-0.005	0.0307
chr5	28395868	G	A	0.35	-0.052	0.008	0	0.0159
chr5	30078281	G	A	0.49	-0.042	0.0075	0.002	0.015
chr5	31063153	G	A	0.13	0.066	0.0114	0.005	0.023
chr5	38263127	C	A	0.61	-0.05	0.0077	-0.004	0.0154
chr5	43239815	G	A	0.67	0.097	0.008	0.012	0.0162
chr5	50344550	G	C	0.87	-0.107	0.0111	-0.001	0.0222
chr5	59208302	T	C	0.49	-0.078	0.0076	-0.007	0.0152
chr5	60716743	A	G	0.34	-0.096	0.0082	0.026	0.0162
chr5	63019432	T	A	0.71	-0.099	0.0083	0.01	0.0166
chr5	66170745	T	G	0.73	0.09	0.0084	0.013	0.0168
chr5	67751221	C	A	0.55	-0.058	0.0075	-0.007	0.0151
chr5	75003678	T	C	0.6	0.123	0.0076	0.028	0.0153
chr5	76602429	G	A	0.5	-0.055	0.0075	0.022	0.015
chr5	77390494	T	C	0.6	-0.048	0.0077	0.01	0.0154
chr5	80928508	T	C	0.77	0.08	0.0089	0	0.0178
chr5	84712893	T	C	0.18	0.08	0.0099	0.003	0.0197
chr5	87988934	T	C	0.85	-0.181	0.0105	0.009	0.0211
chr5	92482226	G	A	0.45	-0.074	0.0077	-0.012	0.0153
chr5	95861012	T	C	0.39	-0.084	0.0077	0.035	0.0153
chr5	98060143	T	C	0.66	0.049	0.008	-0.021	0.0159
chr5	101140461	G	A	0.68	-0.066	0.008	-0.008	0.0161
chr5	102972701	T	G	0.62	-0.046	0.0077	-0.007	0.0154
chr5	103941070	T	G	0.49	0.047	0.0075	-0.006	0.015
chr5	108679147	G	A	0.59	0.086	0.0076	-0.006	0.0152
chr5	115788937	G	A	0.96	0.149	0.0197	-0.002	0.0394
chr5	124332103	C	A	0.56	-0.076	0.0077	-0.017	0.0153
chr5	133861663	T	C	0.43	-0.09	0.0076	0.007	0.0152
chr5	136526751	G	A	0.65	-0.068	0.0078	-0.009	0.0156
chr5	139067682	A	G	0.66	-0.098	0.0082	0.022	0.0164
chr5	146017335	T	C	0.89	-0.093	0.0136	0.012	0.0261
chr5	148757434	T	C	0.69	0.056	0.0082	0.014	0.0164
chr5	153546602	G	A	0.43	0.113	0.0076	0.005	0.0151
chr5	155701481	T	A	0.36	0.053	0.008	0.003	0.0159
chr5	158409804	T	A	0.49	-0.085	0.0075	0.004	0.015
chr5	160046340	T	A	0.81	0.057	0.0095	0.002	0.019
chr5	164476632	C	A	0.56	0.076	0.0078	0.011	0.0157
chr5	170516570	T	C	0.3	-0.1	0.0084	-0.002	0.0168
chr5	172963655	G	A	0.41	-0.056	0.0076	-0.012	0.0152

chr5	179267088	G	C	0.94	-0.095	0.0158	0.023	0.0318
chr6	396321	T	C	0.17	0.098	0.0102	0.024	0.0201
chr6	10012108	A	G	0.35	-0.062	0.008	-0.004	0.0159
chr6	12086826	G	A	0.27	-0.097	0.0085	-0.023	0.017
chr6	15381161	A	G	0.5	0.044	0.0076	0.015	0.0151
chr6	16398959	G	A	0.2	0.059	0.0101	-0.003	0.02
chr6	19806486	A	G	0.44	-0.074	0.0076	0.029	0.0152
chr6	21921026	G	A	0.3	0.073	0.0082	-0.021	0.0164
chr6	40362023	T	C	0.57	-0.104	0.0075	0.034	0.0151
chr6	46316742	G	C	0.48	-0.077	0.0075	0.031	0.015
chr6	50788778	C	A	0.18	0.251	0.0097	0.024	0.0193
chr6	57777113	A	G	0.26	0.07	0.009	-0.006	0.018
chr6	65457371	T	C	0.87	0.064	0.0111	0.013	0.0225
chr6	67412393	T	C	0.12	-0.088	0.0117	0.014	0.023
chr6	69828347	A	G	0.57	-0.063	0.0076	-0.019	0.0152
chr6	76267792	A	G	0.49	-0.048	0.0075	-0.008	0.015
chr6	79427089	G	A	0.37	0.053	0.0078	0	0.0156
chr6	81150794	A	G	0.09	-0.095	0.0135	0.009	0.0265
chr6	84837271	T	C	0.85	0.076	0.0111	0.013	0.0219
chr6	86374328	A	G	0.45	0.065	0.0078	0.001	0.0155
chr6	90322237	G	A	0.05	0.116	0.0168	0.025	0.0331
chr6	93586390	A	G	0.5	-0.047	0.0075	-0.006	0.015
chr6	96199542	T	C	0.84	-0.071	0.0103	-0.008	0.0203
chr6	97385640	T	C	0.66	0.084	0.0079	-0.019	0.0158
chr6	102769537	A	G	0.71	0.051	0.0082	-0.016	0.0165
chr6	104772168	T	C	0.19	-0.098	0.0096	0	0.0191
chr6	106149846	G	A	0.32	0.045	0.0081	-0.007	0.0162
chr6	107832866	G	A	0.6	-0.049	0.0077	0.001	0.0154
chr6	108888593	G	C	0.62	0.12	0.0077	0.034	0.0155
chr6	114089631	A	G	0.65	0.051	0.0079	-0.009	0.0158
chr6	120170293	T	C	0.35	-0.08	0.0079	-0.003	0.0157
chr6	123869770	A	G	0.43	-0.054	0.0076	-0.019	0.0153
chr6	126107951	C	A	0.51	0.054	0.0076	0	0.015
chr6	127118646	G	A	0.76	-0.075	0.0088	0.028	0.0178
chr6	131928008	T	G	0.19	0.083	0.0096	-0.012	0.0193
chr6	137627874	G	A	0.82	-0.079	0.0099	-0.012	0.0196
chr6	141689731	A	G	0.62	-0.084	0.0078	-0.01	0.0155
chr6	142972279	G	C	0.15	0.087	0.0104	0.002	0.0209
chr6	145631389	G	A	0.9	0.097	0.0128	-0.005	0.0256
chr6	153395594	G	C	0.36	0.118	0.0078	-0.03	0.0157
chr6	154380719	A	G	0.17	0.093	0.0101	-0.008	0.0201
chr6	156330289	T	C	0.45	0.056	0.0075	0.017	0.0151
chr6	161666277	G	A	0.27	0.048	0.0085	-0.005	0.0169

chr7	6656830	G	A	0.45	-0.069	0.0075	0.026	0.015
chr7	11904138	C	A	0.7	0.091	0.0083	-0.013	0.0164
chr7	21499828	G	A	0.39	0.06	0.0077	-0.007	0.0154
chr7	22250632	T	G	0.88	-0.079	0.0115	-0.001	0.0228
chr7	24469843	G	A	0.55	-0.059	0.0076	0.004	0.0152
chr7	28198677	T	C	0.5	0.061	0.0075	0.011	0.015
chr7	36752594	T	C	0.59	0.051	0.0076	-0.005	0.0152
chr7	39446016	T	G	0.33	-0.074	0.0079	0.013	0.0158
chr7	44777556	G	A	0.57	0.087	0.0079	-0.023	0.0156
chr7	50544961	G	A	0.55	0.079	0.0076	-0.003	0.0151
chr7	52591508	G	A	0.51	-0.05	0.0075	0.018	0.015
chr7	70048785	T	C	0.55	0.077	0.0076	-0.004	0.0152
chr7	82851756	A	G	0.23	0.057	0.0094	0.009	0.0188
chr7	101626640	T	C	0.25	0.062	0.009	0.004	0.0178
chr7	103444978	T	C	0.43	0.086	0.0076	-0.012	0.0152
chr7	110542452	A	G	0.62	-0.078	0.0078	0.005	0.0156
chr7	113028634	T	A	0.57	0.098	0.0077	0.016	0.0152
chr7	122470450	A	G	0.17	-0.075	0.0102	0.005	0.0201
chr7	124299949	T	C	0.77	0.055	0.009	0.015	0.0178
chr7	126721821	T	G	0.75	-0.064	0.0087	-0.006	0.0175
chr7	129734280	G	A	0.6	0.045	0.0077	-0.001	0.0153
chr7	131576126	A	G	0.18	0.078	0.0098	0.013	0.0196
chr7	132836729	A	G	0.21	0.052	0.0094	0.002	0.0189
chr7	137603252	T	C	0.54	-0.058	0.0076	0.005	0.015
chr7	138817193	T	C	0.91	0.135	0.0129	0.013	0.0262
chr7	148506064	G	A	0.7	0.052	0.0083	-0.018	0.0165
chr7	149157997	T	C	0.36	0.053	0.0081	0.002	0.016
chr7	157472040	T	A	0.64	0.05	0.008	-0.015	0.0158
chr8	1089891	G	C	0.88	-0.075	0.0116	-0.006	0.0231
chr8	4300554	T	C	0.1	0.112	0.0124	-0.001	0.025
chr8	5545090	C	A	0.81	-0.055	0.0096	0.019	0.0194
chr8	14155730	T	G	0.63	-0.088	0.0078	0.002	0.0156
chr8	16169048	T	G	0.4	-0.048	0.0076	-0.019	0.0153
chr8	17081010	G	A	0.24	-0.061	0.0088	0.023	0.0173
chr8	17892029	C	A	0.81	-0.076	0.0095	-0.015	0.019
chr8	21315809	G	A	0.84	0.096	0.0104	-0.011	0.0205
chr8	26241255	C	A	0.96	0.132	0.0187	0.044	0.0377
chr8	28194488	G	A	0.54	0.089	0.0076	-0.018	0.0151
chr8	29352220	T	C	0.29	0.048	0.0083	0.005	0.0164
chr8	30854033	G	A	0.7	-0.103	0.0083	-0.028	0.0163
chr8	32412304	T	G	0.69	-0.06	0.0081	0.022	0.0163
chr8	38327630	C	A	0.6	-0.059	0.0076	-0.017	0.0152
chr8	40944737	G	C	0.66	-0.045	0.0082	-0.011	0.0162



chr8	42455281	G	A	0.5	0.051	0.0076	0.021	0.0151
chr8	51133266	T	A	0.66	0.05	0.0081	-0.014	0.0162
chr8	53161569	T	C	0.82	0.063	0.01	-0.023	0.0198
chr8	59165946	T	G	0.47	-0.042	0.0076	-0.011	0.0152
chr8	60136375	T	C	0.86	-0.094	0.011	0.003	0.022
chr8	73449940	G	A	0.29	0.098	0.0082	-0.004	0.0165
chr8	74791162	G	C	0.88	-0.088	0.012	-0.034	0.0237
chr8	77158792	A	G	0.46	0.111	0.0076	-0.021	0.0153
chr8	79164782	G	C	0.3	-0.061	0.0082	-0.008	0.0164
chr8	81425957	A	G	0.96	0.239	0.0197	-0.081	0.0382
chr8	85622061	C	A	0.77	0.085	0.009	0.004	0.0179
chr8	88981540	G	A	0.53	0.058	0.0075	-0.024	0.015
chr8	91825456	A	G	0.69	-0.046	0.0081	-0.01	0.0163
chr8	95576847	G	A	0.25	-0.099	0.0087	-0.032	0.0176
chr8	97744796	A	G	0.43	-0.059	0.008	-0.004	0.0159
chr8	101947453	T	A	0.61	0.055	0.0078	0.005	0.0155
chr8	105338752	G	A	0.4	0.071	0.0076	0.015	0.0152
chr8	110224296	T	A	0.47	0.066	0.0075	-0.014	0.0151
chr8	112353711	G	A	0.34	-0.059	0.0079	-0.009	0.0158
chr8	116701130	T	C	0.23	-0.103	0.009	0.023	0.0178
chr8	118881077	G	A	0.36	0.076	0.0078	0.026	0.0156
chr8	120909836	G	A	0.45	-0.055	0.0075	0.002	0.0151
chr8	129139206	T	C	0.87	-0.08	0.0109	0.003	0.022
chr8	132880423	T	A	0.11	0.099	0.0119	0.041	0.0234
chr8	135578636	A	G	0.49	-0.056	0.0075	-0.001	0.0149
chr8	138215422	T	C	0.93	0.109	0.0149	-0.043	0.0292
chr8	138899748	A	G	0.79	0.053	0.0093	0.012	0.0186
chr8	143337398	T	C	0.39	0.096	0.0078	0.029	0.0156
chr9	11442765	T	C	0.44	-0.08	0.0076	-0.006	0.0151
chr9	16728721	C	A	0.84	-0.118	0.0103	-0.031	0.0203
chr9	24811059	T	C	0.43	0.043	0.0077	-0.01	0.0152
chr9	28421405	A	G	0.31	0.143	0.0081	-0.008	0.0163
chr9	32409571	C	A	0.54	-0.043	0.0075	0.009	0.0151
chr9	35684822	A	G	0.62	-0.043	0.0078	-0.014	0.0155
chr9	37245476	T	A	0.39	-0.111	0.0077	0.015	0.0154
chr9	71454316	G	A	0.33	0.057	0.008	-0.015	0.016
chr9	73793882	T	A	0.41	0.079	0.0076	-0.012	0.0152
chr9	76909543	C	A	0.67	0.067	0.0083	-0.025	0.0163
chr9	77611258	G	A	0.38	0.048	0.0078	-0.006	0.0155
chr9	79321871	T	C	0.64	0.047	0.0078	-0.016	0.0155
chr9	92215734	T	C	0.49	-0.067	0.0075	0.006	0.0149
chr9	94187247	T	C	0.27	-0.059	0.0086	-0.003	0.0171
chr9	96445803	G	A	0.74	0.08	0.0085	-0.023	0.017

chr9	98373100	G	C	0.24	-0.062	0.0089	-0.007	0.0177
chr9	103113683	A	G	0.52	-0.077	0.0076	0.008	0.0151
chr9	104540574	T	C	0.56	0.069	0.0076	-0.002	0.0151
chr9	105678673	C	A	0.13	-0.074	0.011	0	0.022
chr9	109480510	G	A	0.67	-0.05	0.0079	-0.016	0.0158
chr9	111932785	A	G	0.65	-0.076	0.0079	0.022	0.0158
chr9	114348860	G	C	0.58	-0.049	0.0076	-0.014	0.0152
chr9	116568694	T	C	0.57	0.064	0.0077	0	0.0153
chr9	120387487	T	A	0.36	-0.104	0.0078	0.01	0.0155
chr9	122911053	T	A	0.74	0.09	0.0086	-0.02	0.0171
chr9	124630006	C	A	0.38	0.055	0.0077	-0.013	0.0154
chr9	129408513	G	A	0.61	-0.121	0.0077	0.001	0.0154
chr9	130999472	G	C	0.78	-0.095	0.0092	0.015	0.0184
chr9	133786712	A	G	0.59	-0.099	0.0076	-0.001	0.0153
chr9	137989785	G	C	0.14	0.08	0.0111	-0.008	0.0222
chr9	140265782	T	C	0.12	-0.166	0.0126	-0.028	0.0309
chr10	850157	G	A	0.43	-0.066	0.0076	-0.015	0.0151
chr10	2674458	T	C	0.52	-0.085	0.0075	0.013	0.015
chr10	5501942	T	C	0.72	-0.056	0.0085	-0.008	0.0169
chr10	8850099	T	C	0.42	-0.042	0.0077	0.005	0.0153
chr10	10254086	T	C	0.23	0.06	0.0089	-0.025	0.0178
chr10	11152610	T	C	0.94	-0.088	0.0159	0.007	0.0323
chr10	13549280	T	C	0.81	-0.078	0.0096	0.002	0.0191
chr10	14671520	T	A	0.33	0.045	0.008	-0.005	0.016
chr10	16110387	T	A	0.24	-0.079	0.0088	-0.001	0.0175
chr10	18573654	G	A	0.23	-0.074	0.0089	0.005	0.0177
chr10	21821274	G	A	0.66	-0.123	0.008	0.033	0.016
chr10	25466693	C	A	0.38	0.069	0.0082	0.022	0.0159
chr10	27309906	A	G	0.14	0.081	0.011	-0.013	0.0219
chr10	29882991	T	C	0.53	0.044	0.0075	0.017	0.015
chr10	34070990	T	C	0.33	0.084	0.0081	0.012	0.016
chr10	61251693	G	A	0.51	0.044	0.0075	-0.004	0.015
chr10	62039577	T	C	0.13	0.079	0.0114	-0.003	0.0226
chr10	63351167	A	G	0.64	0.058	0.0078	-0.002	0.0156
chr10	65224459	A	G	0.47	0.084	0.0077	0.006	0.0154
chr10	66626611	C	A	0.33	0.062	0.008	-0.026	0.0161
chr10	77660164	T	A	0.74	0.11	0.0086	-0.01	0.0171
chr10	78760959	T	C	0.56	0.053	0.0076	0.022	0.0151
chr10	79397674	G	A	0.5	0.055	0.0075	-0.002	0.0151
chr10	81034913	G	C	0.52	-0.067	0.0075	0.017	0.015
chr10	82284435	G	A	0.96	0.125	0.022	0.005	0.0432
chr10	83369733	A	G	0.42	-0.051	0.0078	0.018	0.0157
chr10	88125921	T	C	0.44	0.1	0.0076	-0.003	0.0152

chr10	93005457	T	C	0.31	-0.077	0.0085	-0.009	0.0167
chr10	99878997	G	A	0.57	0.079	0.0076	0.017	0.0151
chr10	102626510	T	G	0.34	0.123	0.0086	0.033	0.017
chr10	106460460	T	C	0.57	0.061	0.0076	0.001	0.0153
chr10	110424787	A	G	0.95	-0.098	0.0173	0	0.0341
chr10	111792819	C	A	0.82	-0.073	0.0111	0.024	0.0222
chr10	122061586	A	G	0.64	-0.069	0.008	-0.01	0.0158
chr10	124940549	G	A	0.9	0.112	0.0124	-0.025	0.0246
chr10	126658075	G	A	0.58	0.093	0.0077	0.021	0.0152
chr10	130125428	A	G	0.8	0.052	0.0093	0.005	0.0186
chr10	132912822	G	A	0.75	-0.074	0.0087	-0.006	0.0174
chr10	134938590	G	A	0.74	-0.087	0.0094	-0.01	0.0187
chr11	2857297	G	A	0.45	-0.048	0.0076	0.007	0.0152
chr11	6239344	G	A	0.44	0.048	0.0077	-0.01	0.016
chr11	8639325	G	A	0.37	-0.109	0.0078	0.018	0.0155
chr11	10598395	G	A	0.57	0.06	0.0076	-0.001	0.0152
chr11	11863080	G	A	0.86	0.074	0.0108	-0.016	0.0214
chr11	13346294	T	C	0.37	-0.09	0.0078	0.007	0.0155
chr11	16612909	G	A	0.8	-0.087	0.0096	0.017	0.0191
chr11	20176986	T	C	0.62	-0.047	0.0079	0.002	0.0157
chr11	20959394	T	C	0.05	0.103	0.0172	-0.012	0.0348
chr11	21676189	A	G	0.35	0.054	0.008	-0.011	0.0161
chr11	27653995	T	C	0.21	-0.203	0.0092	0.02	0.0182
chr11	33196995	A	G	0.65	-0.06	0.0096	-0.009	0.019
chr11	36199983	T	C	0.13	0.074	0.0112	0.031	0.0223
chr11	43669653	A	G	0.31	0.082	0.0081	0.006	0.0162
chr11	55441896	T	G	0.66	-0.057	0.0089	0.012	0.0178
chr11	65639374	T	C	0.65	-0.096	0.0079	0.015	0.0158
chr11	69449784	T	A	0.41	-0.108	0.0079	0.017	0.0158
chr11	72462375	T	C	0.77	-0.096	0.0089	0.008	0.0178
chr11	76495076	T	C	0.23	-0.075	0.0091	0.001	0.0179
chr11	79129347	T	G	0.63	-0.047	0.0078	-0.001	0.0156
chr11	80624953	A	G	0.7	-0.068	0.0083	0.002	0.0165
chr11	83478952	G	A	0.2	0.055	0.0094	0.002	0.0187
chr11	84776849	G	A	0.5	0.071	0.0075	0	0.015
chr11	89918373	G	A	0.31	-0.079	0.0082	-0.014	0.0164
chr11	93221726	T	G	0.5	-0.071	0.0075	0	0.015
chr11	94867733	T	C	0.52	0.046	0.0075	-0.019	0.0149
chr11	99168204	A	G	0.6	0.042	0.0076	0.012	0.0153
chr11	100178540	T	C	0.68	-0.062	0.0081	0.004	0.0161
chr11	101468039	G	A	0.36	0.048	0.0078	0.02	0.0156
chr11	106763414	T	A	0.67	0.072	0.008	-0.019	0.0159
chr11	109272074	G	A	0.72	-0.056	0.0086	0.005	0.0172

chr11	110947521	T	A	0.3	0.052	0.0083	0.004	0.0166
chr11	115078492	T	C	0.57	0.117	0.0076	0.02	0.0151
chr11	121998149	A	G	0.8	-0.083	0.0096	-0.005	0.0191
chr11	127053249	G	A	0.79	0.059	0.0092	0	0.0183
chr11	128568489	T	C	0.54	0.045	0.008	-0.01	0.0156
chr11	129297948	T	C	0.74	-0.07	0.0087	0.021	0.0173
chr11	130803634	G	A	0.47	0.09	0.0075	-0.018	0.0149
chr12	12342821	G	A	0.91	-0.072	0.0129	-0.001	0.0257
chr12	13659564	T	C	0.41	-0.065	0.0081	-0.02	0.0161
chr12	17774918	T	G	0.12	-0.109	0.0117	-0.027	0.0237
chr12	19282670	T	C	0.76	0.087	0.0089	0.004	0.0178
chr12	24059999	T	C	0.87	-0.101	0.0113	-0.027	0.0221
chr12	31819262	G	A	0.93	-0.093	0.0145	0.001	0.0288
chr12	33372590	G	A	0.86	-0.125	0.011	0.041	0.022
chr12	39420446	A	G	0.56	-0.109	0.0076	-0.013	0.0152
chr12	41861289	C	A	0.48	0.067	0.0075	-0.027	0.015
chr12	42924037	T	C	0.5	0.048	0.0075	0.006	0.0151
chr12	50263148	G	A	0.61	-0.241	0.0077	-0.004	0.0153
chr12	56396768	G	C	0.67	0.089	0.008	0.001	0.016
chr12	61608632	G	A	0.95	-0.142	0.0194	0.024	0.0403
chr12	68205604	G	A	0.83	-0.078	0.0099	-0.023	0.0196
chr12	70755711	G	A	0.14	0.098	0.0108	-0.026	0.0219
chr12	76467282	A	G	0.2	-0.06	0.0097	0.001	0.0192
chr12	77624358	G	A	0.55	0.045	0.0075	-0.018	0.015
chr12	80757484	T	A	0.08	0.084	0.0139	-0.026	0.028
chr12	82426466	T	C	0.76	0.059	0.0088	0.009	0.0175
chr12	83620372	A	G	0.53	0.046	0.008	0.005	0.016
chr12	87797128	T	C	0.08	-0.09	0.0138	0.012	0.0273
chr12	89745477	C	A	0.47	0.076	0.0075	0.011	0.015
chr12	99600749	T	C	0.21	0.099	0.0093	-0.015	0.0188
chr12	100352833	A	G	0.6	-0.052	0.0078	0	0.0157
chr12	101520648	A	G	0.35	0.046	0.0079	0.002	0.0158
chr12	107713511	G	C	0.49	-0.059	0.0075	-0.002	0.015
chr12	111826477	A	G	0.51	0.092	0.0078	0.02	0.0155
chr12	122602305	G	A	0.53	-0.081	0.0076	-0.005	0.0152
chr12	128724922	C	A	0.77	0.055	0.0092	0.005	0.0185
chr13	27998600	T	C	0.71	0.117	0.0083	-0.015	0.0166
chr13	29700769	A	G	0.78	0.051	0.0091	-0.003	0.0182
chr13	36469881	A	G	0.8	-0.066	0.0095	0.001	0.019
chr13	38817673	A	G	0.52	-0.049	0.0078	-0.005	0.0154
chr13	40791197	A	G	0.32	0.089	0.0081	-0.025	0.0163
chr13	50741315	T	C	0.96	0.128	0.0191	-0.024	0.0377
chr13	54107352	G	A	0.87	-0.208	0.0112	0.005	0.0225

chr13	59399034	C	A	0.24	0.134	0.0088	0.025	0.0174
chr13	62846611	T	C	0.33	-0.056	0.008	-0.002	0.016
chr13	66204127	A	G	0.59	-0.121	0.0076	-0.01	0.0152
chr13	68430810	T	G	0.79	0.052	0.0092	0.014	0.0184
chr13	69899106	A	G	0.54	0.042	0.0075	0.006	0.015
chr13	71669695	T	C	0.46	0.048	0.0075	0.002	0.015
chr13	72370412	T	G	0.61	-0.049	0.0076	0.003	0.0153
chr13	73848255	T	G	0.28	-0.047	0.0084	0.008	0.0167
chr13	79580675	A	G	0.61	0.12	0.0077	0.015	0.0155
chr13	85362483	G	C	0.52	-0.061	0.0077	-0.007	0.0154
chr13	89213194	T	C	0.42	0.059	0.0076	0.011	0.0152
chr13	90432585	T	G	0.52	0.042	0.0075	0.007	0.015
chr13	91972194	T	C	0.91	0.109	0.014	0.031	0.0281
chr13	95054345	G	C	0.49	-0.049	0.0076	0.006	0.0151
chr13	97047020	G	A	0.54	-0.084	0.0076	0.01	0.0151
chr13	99113308	A	G	0.28	-0.081	0.0085	0.013	0.0169
chr13	101700124	G	C	0.22	0.067	0.009	0.023	0.018
chr13	109707827	T	C	0.87	0.076	0.0115	0.006	0.0229
chr13	112191837	G	C	0.37	-0.077	0.0078	-0.011	0.0156
chr14	21101147	T	C	0.85	-0.061	0.0108	-0.003	0.0215
chr14	25947436	T	C	0.67	0.108	0.008	0.019	0.0159
chr14	26654291	T	C	0.34	0.045	0.0079	-0.019	0.0158
chr14	29681294	G	A	0.23	-0.149	0.0089	-0.021	0.0177
chr14	33298732	A	G	0.54	-0.116	0.0075	-0.005	0.015
chr14	40762993	G	A	0.27	-0.07	0.0085	0.007	0.017
chr14	42469834	G	A	0.96	-0.103	0.0181	0.035	0.0368
chr14	47311988	C	A	0.51	0.074	0.0075	-0.002	0.015
chr14	56127108	A	G	0.73	0.059	0.0084	0.008	0.0168
chr14	58856652	T	C	0.64	0.047	0.0082	-0.019	0.0162
chr14	59609282	T	G	0.72	-0.049	0.0083	-0.007	0.0167
chr14	63109788	T	G	0.2	0.062	0.0094	0.013	0.0187
chr14	64977739	C	A	0.34	-0.054	0.0079	-0.016	0.0159
chr14	69795199	G	A	0.61	0.072	0.0077	0.006	0.0154
chr14	73393284	G	A	0.49	-0.084	0.0077	-0.002	0.0152
chr14	77541763	A	G	0.43	0.062	0.0081	-0.017	0.0161
chr14	79899454	T	C	0.53	0.109	0.0075	0.015	0.0149
chr14	91499132	A	G	0.38	-0.108	0.0081	0.009	0.0162
chr14	93903994	G	A	0.44	-0.11	0.0076	-0.01	0.0151
chr14	99670791	G	A	0.55	0.077	0.0075	-0.005	0.0151
chr14	101529005	G	A	0.65	-0.114	0.0093	0.008	0.0187
chr15	26874395	T	C	0.27	0.051	0.0088	0.016	0.0173
chr15	32142710	T	C	0.47	0.051	0.0075	0.007	0.015
chr15	36391893	T	C	0.5	-0.084	0.0075	0.028	0.015

chr15	53101580	T	A	0.86	-0.115	0.0107	-0.005	0.0213
chr15	57099412	A	G	0.23	0.094	0.0091	0.01	0.0182
chr15	68080886	T	A	0.37	-0.141	0.0078	0.008	0.0155
chr15	73082366	T	C	0.32	-0.099	0.008	-0.019	0.0161
chr15	79403585	T	C	0.4	-0.083	0.0077	-0.007	0.0153
chr15	91984364	A	G	0.59	-0.057	0.0084	0.004	0.0168
chr15	93526968	G	A	0.75	-0.08	0.0087	0.013	0.0175
chr15	95276680	G	A	0.62	0.062	0.0078	-0.012	0.0155
chr15	100026015	T	C	0.74	-0.067	0.0088	-0.005	0.0175
chr15	100692953	G	A	0.9	-0.094	0.0147	0.02	0.0296
chr15	102070042	G	A	0.59	-0.045	0.0077	-0.012	0.0155
chr16	7760884	T	G	0.51	-0.066	0.0078	0.018	0.0154
chr16	13002387	T	C	0.07	-0.092	0.0153	-0.023	0.031
chr16	15128416	G	A	0.25	-0.076	0.0091	-0.015	0.0182
chr16	16974936	T	C	0.58	0.05	0.0076	-0.015	0.0151
chr16	19932005	A	G	0.84	0.171	0.0103	0.021	0.0207
chr16	24747787	G	C	0.19	-0.144	0.0095	0.003	0.0191
chr16	28868695	G	A	0.62	-0.176	0.0077	0.06	0.0156
chr16	53803574	T	A	0.59	-0.521	0.0076	0.009	0.0152
chr16	58629325	A	G	0.25	0.053	0.0087	-0.016	0.0175
chr16	61040594	G	C	0.69	0.054	0.0082	0.019	0.0164
chr16	63062600	C	A	0.82	-0.093	0.0101	-0.035	0.0197
chr16	69704122	A	G	0.58	0.124	0.0076	0.004	0.0152
chr16	81738525	T	C	0.42	0.085	0.0077	0.008	0.0153
chr16	85302471	A	G	0.13	0.071	0.012	-0.028	0.024
chr16	89714829	G	C	0.88	0.112	0.0137	-0.009	0.0273
chr17	1843865	G	C	0.82	0.128	0.0098	0.02	0.0195
chr17	31465704	T	C	0.28	-0.066	0.0084	-0.005	0.0168
chr17	32252309	C	A	0.35	-0.049	0.0078	-0.006	0.0157
chr17	34884149	T	C	0.59	0.139	0.0076	0.007	0.0153
chr17	38218773	G	A	0.58	0.053	0.0077	0.021	0.0156
chr17	53335828	T	G	0.26	-0.062	0.0087	-0.013	0.0174
chr17	55498377	T	C	0.05	-0.131	0.0173	-0.033	0.0353
chr17	59491384	G	A	0.67	0.063	0.0079	-0.015	0.0159
chr17	65830282	G	A	0.2	0.084	0.0095	-0.006	0.0189
chr17	71126150	T	C	0.38	-0.068	0.008	0.001	0.0158
chr17	75714917	C	A	0.38	-0.045	0.0078	-0.001	0.0155
chr17	76811792	A	G	0.48	0.041	0.0075	-0.011	0.0149
chr17	78757626	G	A	0.31	-0.136	0.0083	0.008	0.0164
chr18	895706	G	A	0.13	-0.12	0.011	-0.024	0.0222
chr18	1839339	T	C	0.15	0.153	0.0107	-0.013	0.0213
chr18	9162802	T	C	0.37	-0.069	0.0078	-0.002	0.0155
chr18	11996337	G	A	0.66	-0.051	0.008	0.001	0.0159

chr18	13158053	G	A	0.65	-0.048	0.0079	0.003	0.0158
chr18	21116998	G	A	0.47	-0.12	0.0075	0.045	0.015
chr18	31251276	G	A	0.55	-0.088	0.0075	-0.035	0.015
chr18	34950576	T	C	0.12	-0.116	0.0117	-0.008	0.0231
chr18	39678828	T	G	0.63	-0.099	0.0078	0	0.0155
chr18	44760901	G	A	0.55	0.06	0.0075	0.003	0.015
chr18	45921214	G	A	0.46	-0.079	0.0075	0.026	0.015
chr18	46487101	G	A	0.76	-0.059	0.0088	-0.015	0.0177
chr18	50398782	A	G	0.83	0.105	0.0101	-0.007	0.02
chr18	57850928	A	G	0.77	-0.346	0.0088	0.007	0.0177
chr18	60845884	T	C	0.62	-0.071	0.0077	-0.017	0.0155
chr18	63435458	A	G	0.7	-0.083	0.0082	-0.011	0.0163
chr18	69236820	T	C	0.63	-0.075	0.0079	-0.006	0.0157
chr18	76750100	T	C	0.06	-0.15	0.0162	-0.046	0.033
chr19	9431515	A	G	0.73	-0.075	0.0102	0.02	0.0201
chr19	10590508	G	C	0.92	-0.099	0.015	0.001	0.0294
chr19	13043451	G	A	0.91	-0.121	0.0134	-0.014	0.0269
chr19	14810827	T	G	0.61	0.046	0.0076	-0.017	0.0153
chr19	31000299	A	G	0.86	0.119	0.011	0.024	0.0222
chr19	34307002	G	A	0.33	-0.119	0.0079	-0.01	0.0159
chr19	46181392	G	C	0.79	0.16	0.0092	0.026	0.0185
chr19	51111444	A	G	0.04	0.218	0.0242	-0.034	0.05
chr19	58310895	C	A	0.4	-0.049	0.0077	0.002	0.0153
chr20	3017674	T	G	0.5	0.069	0.0075	0.015	0.015
chr20	8298480	C	A	0.76	0.057	0.0091	-0.009	0.018
chr20	11218921	G	A	0.52	-0.044	0.0076	0.006	0.0151
chr20	12568933	C	A	0.7	-0.058	0.0083	0.021	0.0165
chr20	14843361	T	A	0.68	-0.056	0.0084	-0.012	0.0167
chr20	15838024	G	C	0.88	-0.101	0.0116	0.006	0.023
chr20	17207721	T	G	0.27	-0.093	0.0089	-0.026	0.0177
chr20	21483469	T	A	0.12	0.119	0.0114	0.028	0.0228
chr20	25533873	G	A	0.96	0.184	0.0218	-0.003	0.0418
chr20	30836608	T	C	0.15	0.096	0.0104	0.009	0.0207
chr20	32542814	G	A	0.34	0.063	0.0082	0.023	0.0161
chr20	37306246	A	G	0.31	0.06	0.0082	0.004	0.0163
chr20	40043096	T	C	0.8	-0.07	0.0095	-0.002	0.0189
chr20	41948840	C	A	0.95	0.104	0.0171	-0.034	0.0327
chr20	48594190	T	A	0.13	0.116	0.0113	0.033	0.0222
chr20	51159189	T	A	0.17	-0.155	0.0099	0.012	0.0197
chr20	53554704	T	C	0.33	0.061	0.008	-0.011	0.0162
chr20	54381566	T	C	0.8	0.129	0.0093	-0.009	0.0186
chr20	61522908	G	A	0.54	-0.071	0.0076	-0.024	0.0152
chr21	17782214	A	G	0.36	0.054	0.0083	0.013	0.0164

chr21	19899801	T	C	0.23	0.05	0.0091	-0.021	0.0182
chr21	22284500	T	A	0.21	-0.057	0.0094	0.012	0.0186
chr21	25380778	G	A	0.72	0.055	0.0084	-0.002	0.0168
chr21	27769852	G	A	0.39	0.05	0.0077	0.004	0.0154
chr21	30408670	T	A	0.25	0.086	0.0089	0.014	0.0176
chr21	33192258	T	G	0.16	-0.064	0.0104	-0.01	0.0207
chr21	34144285	A	G	0.91	0.087	0.0144	0.004	0.0289
chr21	40310590	A	G	0.36	-0.13	0.0079	-0.012	0.0158
chr21	42630531	G	A	0.68	0.091	0.008	-0.008	0.016
chr21	43280913	G	A	0.7	-0.049	0.0082	-0.02	0.0163
chr21	46564154	T	A	0.44	-0.096	0.0076	0.031	0.0152
chr22	18209718	T	C	0.17	0.081	0.01	0.007	0.0201
chr22	19948337	T	C	0.6	0.079	0.0076	-0.02	0.0152
chr22	26923325	G	A	0.58	-0.058	0.0076	0.017	0.0152
chr22	32178125	T	A	0.94	-0.122	0.0179	0.001	0.036
chr22	33961918	T	C	0.69	0.069	0.0082	0.004	0.0163
chr22	37071533	T	C	0.73	-0.055	0.0087	-0.015	0.0173
chr22	37761453	C	A	0.72	-0.048	0.0083	0.012	0.0167
chr22	39739187	T	C	0.3	0.062	0.0083	-0.009	0.0166
chr22	46615376	G	A	0.87	-0.087	0.0115	-0.015	0.0226
chr22	48874310	T	C	0.42	0.088	0.0077	-0.02	0.0154
chr22	50711910	G	C	0.19	-0.066	0.0098	-0.001	0.0197
chrx	1898833	A	G	0.31	-0.073	0.0086	0.001	0.0206
chrx	23357213	G	C	0.18	-0.063	0.0082	0.032	0.0155
chrx	45170642	G	C	0.28	0.043	0.0078	0.009	0.0147
chrx	50492754	T	G	0.97	0.316	0.0241	-0.008	0.0549
chrx	69859011	T	C	0.57	-0.047	0.0063	0	0.012
chrx	83471746	A	G	0.86	-0.05	0.0092	0.023	0.0177
chrx	85594161	G	A	0.81	-0.063	0.0081	-0.012	0.0155
chrx	96604082	A	G	0.6	0.042	0.0064	0	0.0123
chrx	109800345	G	A	0.59	-0.048	0.0063	-0.005	0.0121
chrx	115996626	C	A	0.37	0.04	0.0064	-0.013	0.0123
chrx	117918130	G	A	0.84	-0.152	0.0084	-0.028	0.0159
chrx	119891068	G	A	0.39	0.076	0.0064	-0.005	0.0122
chrx	130480273	G	A	0.48	0.055	0.0062	0.001	0.0119
chrx	133322604	T	C	0.05	0.087	0.0146	-0.006	0.0274
chrx	136113464	C	A	0.49	0.08	0.0062	-0.007	0.012
chrx	139393395	T	C	0.21	-0.058	0.0077	0.001	0.0149
chrx	147802186	A	G	0.89	-0.067	0.0102	0.012	0.0197



