

**Identification of Functional Variants in the FAM13A COPD GWAS locus by
Massively Parallel Reporter Assays**

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Online Data Supplement

Online Materials and Methods

Human Study Populations

Five study samples of smokers enriched for COPD were used for genetic association analysis (COPDGene, ECLIPSE, GenKOLS, the National Emphysema Treatment Trial (NETT), and the Normative Aging Study (NAS)). These study samples and genotyping methods have been previously described(1). COPD cases were defined according to Global Initiative for Chronic Obstructive Lung Disease (GOLD) spirometric criteria, and smoking controls were defined by FEV_1 % predicted $\geq 80\%$ and $FEV_1/FVC \geq 0.7$.

Results from a previously reported COPD GWAS were used to initially prioritize variants near *FAM13A* for testing in MPRA(1). Fine mapping and conditional analyses were performed in 5,346 non-Hispanic white (NHW) subjects from COPDGene, and conditional meta-analysis for selected variants was performed in 9,716 subjects of European descent from the five cohorts mentioned above. To investigate the COPD association with a newly identified secondary signal at rs147089648, we performed meta-analysis in white subjects from the five studies mentioned above.

Oligo array design and MPRA library construction

We designed MPRA oligonucleotides that included both biallelic variant alleles for all common SNPs in the *FAM13A* GWAS locus associated with COPD affection status with $p < 0.02$ in a COPD GWAS meta-analysis using 1000 Genomes imputed variants(1). To increase our likelihood of capturing regulatory variants in this region, we also included cis eQTL SNPs at $FDR < 0.01$ for *FAM13A* mRNA levels in whole blood from subjects with COPD(2). In total, 606 SNPs were tested for allele-specific enhancer

activity in the MPRA assay. For each SNP, we designed 6 oligonucleotide sequences by shifting the two alleles to three different locations (close to the 5'-end, middle, and 3'-end) of the oligonucleotide. Each oligonucleotide was tested in both forward and reverse orientations relative to the reference genome, resulting in 12 unique oligonucleotide contexts for each SNP. We applied 33 sequencing tags per oligonucleotide sequence to facilitate parallel measurements and reduce the impact of any potential bias from tag sequence. MPRA oligonucleotides were synthesized on a 244K Agilent array and cloned into the pGL4.10M2 backbone MPRA library vector containing either a strong promoter (simian virus 40 promoter, i.e. SV40) or a relatively weak promoter (minimal promoter, i.e. minP) to test regulatory activities of 144 base pair length oligonucleotides containing potential functional genetic variants(3).

Transfection of MPRA library

Two MPRA libraries (SV40 and MinP) were transfected into Beas-2B cells using a Nucleofector II Device with P3 Primary Cell 4D-Nucleofector® X Kit (Lonza) in parallel. Twenty-four hours later, cells were harvested for mRNA isolation (Qiagen). After reverse transcription (Life technologies SuperScript® III First-Strand Synthesis System), the cDNA was amplified with barcoded primers by PCR to construct sequencing libraries, MPRA libraries were amplified in parallel as input control, as previously described(3). 36nt single-end RNA sequencing was performed using an Illumina HiSeq 2000.

Statistical Analysis of MPRA Data

For the MPRA experiments, the pre-transfection sequencing data from MPRA library constructs is referred to as “input” or “plasmid” data, and the post-transfection data is referred to as “output” or “RNA”. MPRA barcodes were identified in the sequencing data, and reads that did not contain an exact barcode match were excluded from subsequent analysis. The final barcode counts for each experiment were computed by adding the barcode counts across two duplicate lanes. Barcode counts were normalized by the total number of sequenced barcodes in each plasmid or RNA pool. Barcodes with counts less than or equal to 5 in either the plasmid or RNA pool were excluded from subsequent analysis. For each unique oligonucleotide sequence, 33 barcodes were designed resulting in a maximum of 33 observed RNA/plasmid ratios. We compared the RNA/plasmid ratios of the barcodes between the two alleles for each SNP, orientation, and location using the Mann-Whitney U-test to test allele-specific enhancer or silencer activity while controlling the false discovery rate (FDR) at 5% using the Benjamini-Hochberg procedure. To test for significant regulatory effects of individual oligonucleotide sequences, we tested whether the median of the ratios of the normalized RNA and plasmid counts for each oligonucleotide was equal to 1 using the sign test while controlling for FDR at 5%.

Cell culture

Human bronchial epithelial cell line Beas-2B or 16HBE cells were purchased from ATCC and cultured in Dulbecco's Modified Eagle Medium (DMEM) or Eagle's Minimal Essential Medium (EMEM), respectively, supplemented with 10% fetal bovine serum, penicillin (50 units/ml), and streptomycin (50 µg/ml).

Molecular cloning and reporter assays

SNP-containing oligonucleotides were cloned into the PGL4.23 (Promega) vector amplified from BAC clones. Mutant constructs for SNPs were made using an in-situ mutagenesis kit (Agilent, #200521). All plasmids used for reporter assays were confirmed by sequencing. We performed reporter assays in 16HBE cells as previously described(4). Briefly, 60% confluent 16HBE cells were seeded into a 24-well plate at a density of 1×10^5 cells per well. Forty-eight hours after transfection with various reporter constructs along with TK-renilla, cells were collected to measure enhancer activity using the Dual-Luciferase Reporter Assay System (Promega) according to the manufacturer's protocol. Luminescence signals were captured in a Wallac VICTOR3 1420 plate reader (Perkin Elmer). Firefly signals were normalized to TK-renilla signals to calculate enhancer activities for each construct. Independent transfection and reporter assays were performed at least three times.

Chromatin conformation capture assay (3C)-PCR

Briefly, 8×10^7 human 16HBE cells were cross-linked and lysed, and chromatin was digested with BglII overnight. Crosslinked and digested fragments were ligated with T4 ligase (New England Biolabs, # M0202L) for 6 hours at 16°C. 3C products were detected with 3C unidirectional PCR primers in triplicate PCR reactions. 3C-PCR primers were designed targeting DNA fragments at sizes between 1 and 10 kb after BglII digestion. We also limited primer designs for highly repeated genomic regions due to possible low specificity. Primer sequences used for 3C-PCR are listed in Table E4.

CRISPR-based SNP modification

Homology directed repair (HDR) SNP modification of rs2013701 by the CRISPR/Cas9 system was conducted similarly to previously described methods(5, 6). Briefly, sgRNA1 AATGTTTCAGTGTAACAGTT for Cas9 were cloned to the vector pSpCas9(BB)-2A-puro (Addgene #62988). sgRNA2 GGGTACAGTACACTCCTCAGGCA for LbCpf1 was cloned to the vector pTE4398 (Addgene #74042). Plasmids were co-transfected with ssODN template which has 50nt flanking rs2013701 at both arms with T allele into 16HBE cells using Lipofectamine 3000 (Thermo Fisher Scientific). Following antibiotic selection, cells were recovered in regular medium for 2-3 days before seeding into 96 well plates for single cell colony selection. Positive HDR events were detected by ddPCR (Bio-rad), with edit probe ACAGTTTGTGGTACAGTACA-FAM-IowaBlack and native probe AACAGTTTGGGGTACAGTACA-3Phos synthesized by IDT Biotechnologies at 56.2°C annealing temperature. After selection and expansion, we obtained 2 independent TT homozygous CRISPR lines from two different sgRNAs for further studies. Another 2 independent GG homozygous CRISPR lines of 16HBE cells transfected with the same gRNA with unedited rs2013701 were used as control lines.

Gene expression level detection

RNA extraction (Qiagen) was carried out 48 hours after cell attachment, and RT-PCR was performed by using SuperScript-RT system (Invitrogen). Quantitative RT-PCR was performed on a QuantStudio™ 12K Flex Real-Time PCR System with gene-specific TaqMan probes (IDT). Relative gene expression level was calculated based on the

standard $2^{-\Delta\Delta CT}$ method, using PPIA (Peptidylprolyl Isomerase A) as a reference gene. Gene expression comparisons were carried out using unpaired t tests.

Cell Proliferation Rate Measurement

Different single clones of edited 16HBE cells with either GG or TT genotype at rs2013701 were seeded into seven to eight 96-well plates at a density of 10,000 cells per well in triplicate for each clone. Cells grown at different time points were collected on different days for proliferative cell curve measurements using the CyQUANT® NF Cell Proliferation Assay Kit (Invitrogen, C35006). All of the DNA content readings after day 0 were normalized to day 0 readings. Cultures were incubated at 37°C in a humidified 5% CO₂/air atmosphere, and the medium was changed every other day.

Supplemental Files: Table E1-E4

Table E1: SNPs with significant expression-regulating effects in MPRA assay.

Table E2: SNPs with significant allele-specific expression in MPRA.

Table E3: Conditional analysis on 45 MPRA SNPs.

Table E4: 3C PCR primers sequences.

Supplemental Figures: Figure E1-E7

Figure E1. Schematic overview of the study.

Figure E2. Correlation between replicate MPRA experiments. Two MPRA experiments were performed with plasmids containing either a weak (minP) or strong (SV40) promoter. The correlation in RNA counts between experiments was high for counts collapsed at the level of unique oligonucleotides (A) and for individual barcode counts (B).

Figure E3. Minimum P-value Distribution of Pairwise Conditional Analysis of 1,035 Pairs of 46 SNPs across the FAM13A Region. SNPs tested in pairwise conditional analysis consisted of 45 MPRA significant SNPs as well as the GWAS lead SNP rs4416442. Each analysis tested 802 variants near FAM13A with MAF > 1%. For each analysis, the lowest p-value was recorded. The distribution of these p-values is shown in the histogram above.

Figure E4. Linkage Disequilibrium (LD) Blocks for 25 MPRA SNPs near FAM13A.

The primary and secondary COPD GWAS associations lie within a 100kb LD block.

Figure E5. Chromatin Conformation Capture assay. A. Schematic illustration shows the relative location and distance of the 3C primers targeting the promoter, the positive control sequence, and the SNPs tested in Figure 5. The arrow shows the direction of transcription for *FAM13A*. B. 3C PCR results show the interaction between the FAM13A promoter region and specific SNP regions. Primer targeting the promoter of FAM13A was used as anchor primer in 3C assay. Bacterial artificial clone (BAC) templates with the same preparation as cell templates in 3C assay were used as controls for primer efficiency, and all of the PCR reactions were performed in triplicate under the same

conditions.

Figure E6. CRISPR/Cas9 based SNP modification in 16HBE cells. A. Two guide RNAs were used for CRISPR/Cas9 based SNP modification for rs2013701. sgRNA1 is for spCas9 and sgRNA2 is for Cpf1. Locations and sequences of gRNAs are shown on the schematic illustration. B. Sanger sequencing results were shown from representative CRISPR lines with each genotype. Parental 16HBE cells are GG homozygous at rs2013701.

Figure E7. Genotype-Tissue Expression (GTEx) project expression quantitative trait locus (eQTL) analysis. A. eQTL SNPs association with expression of *FAM13A* in human lung tissues as shown in a locus plot with coloring of the data points by r^2 value to rs2013701. rs2013701 is in tight linkage disequilibrium with the lead eQTL SNP, rs1964516 ($r^2=0.96$ in 1000 Genomes EUR population). B. The T allele of rs2013701, COPD risk allele, is also associated with increased expression of *FAM13A* in human lung tissue samples in the GTEx version 7 eQTL analysis ($p=3.8 \times 10^{-5}$). The number of samples in each genotype class is listed.

References

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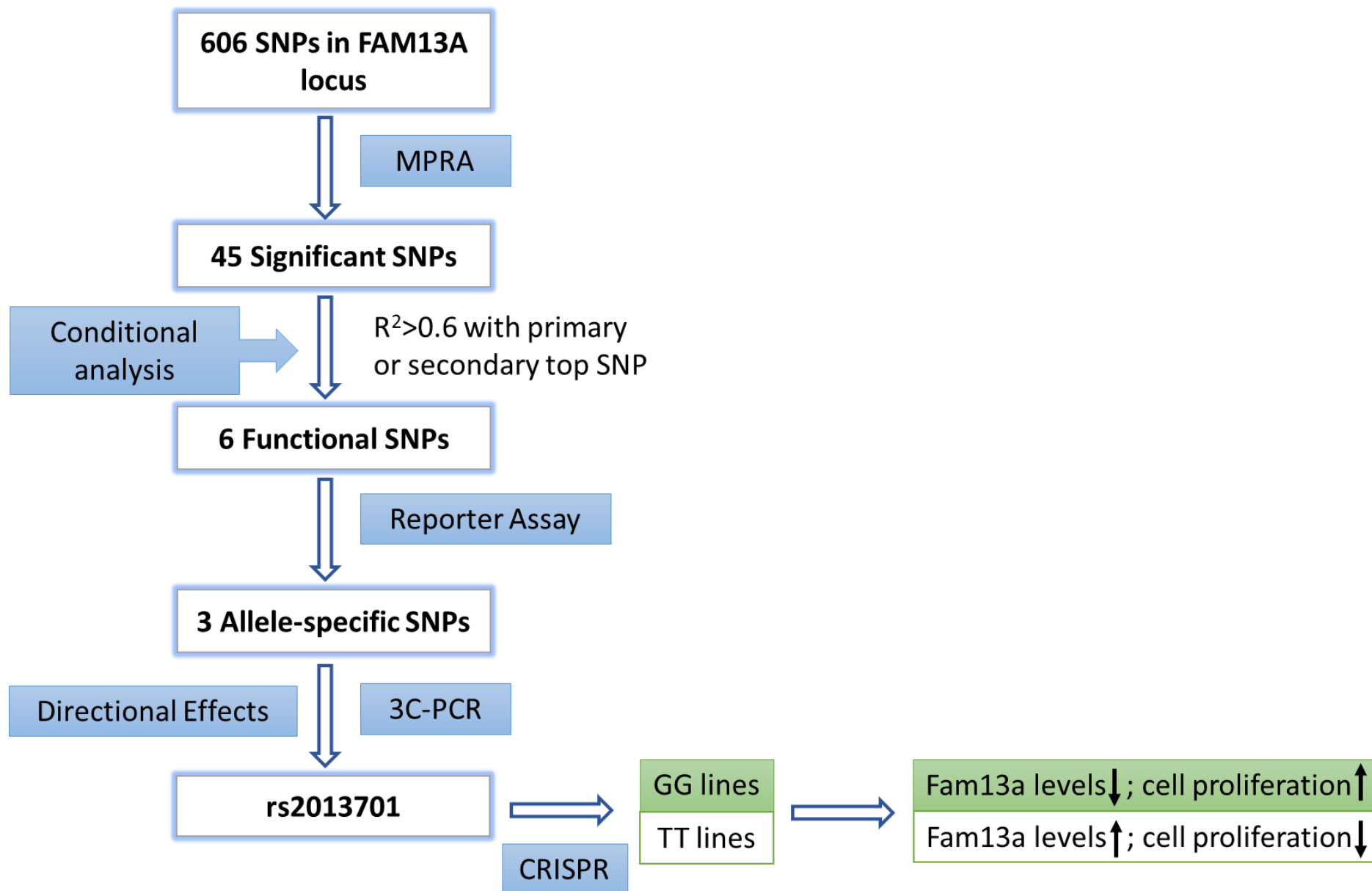


Figure E1

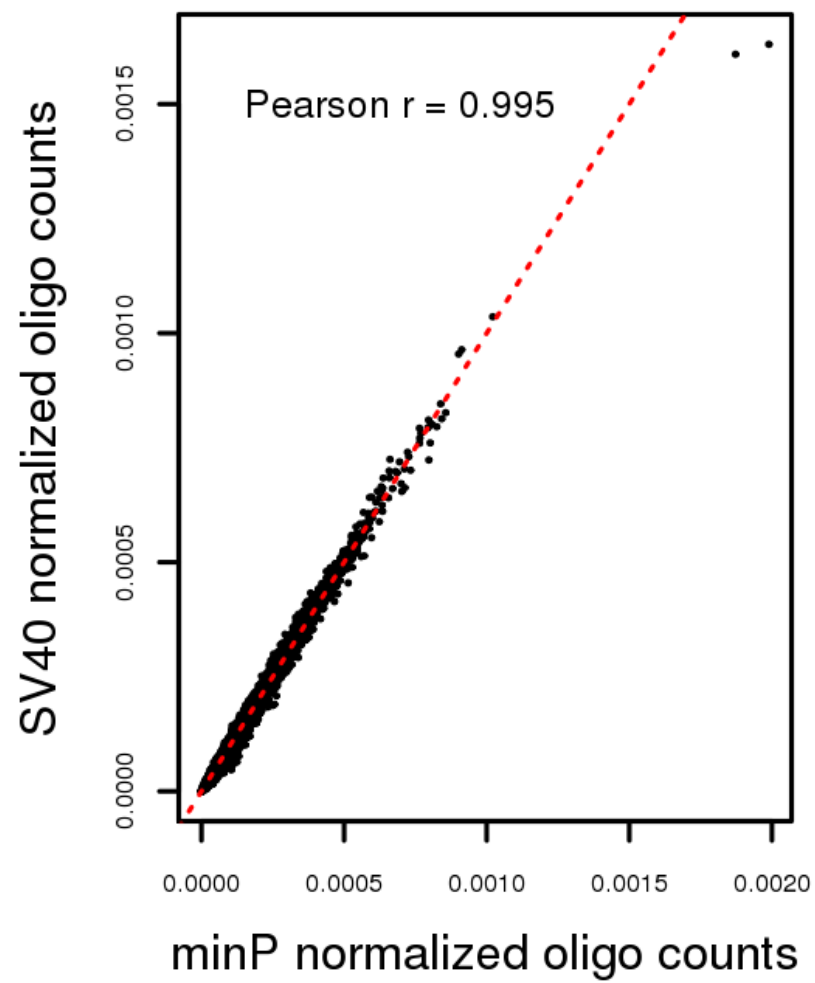
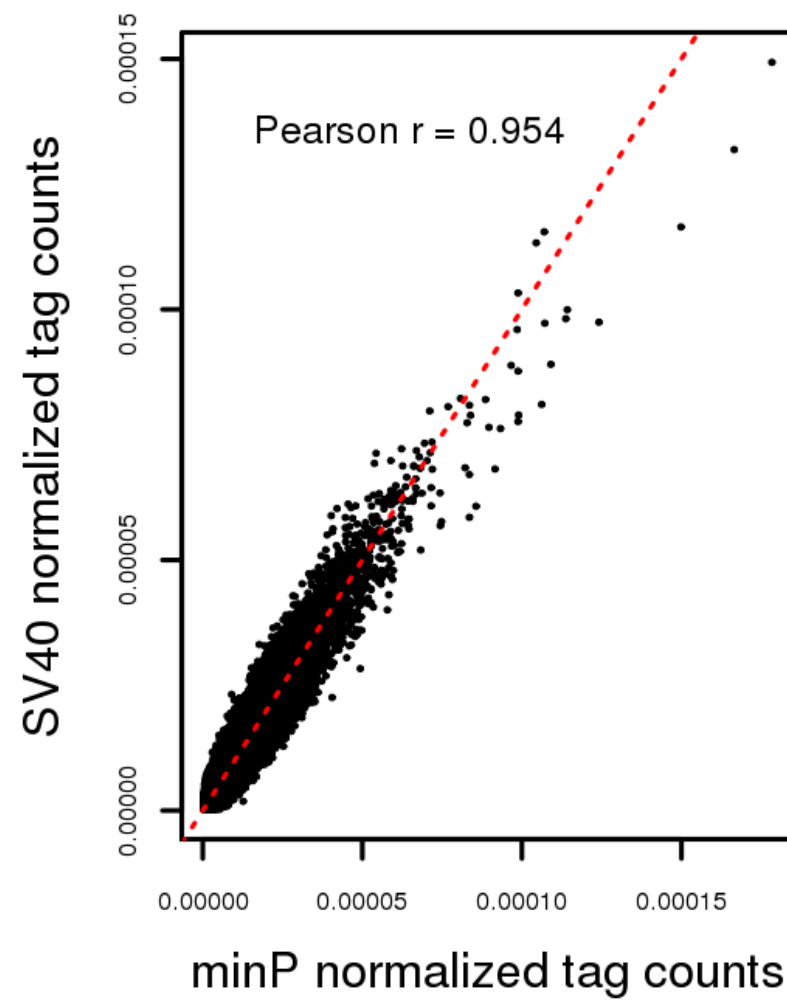
A**B**

Figure E2

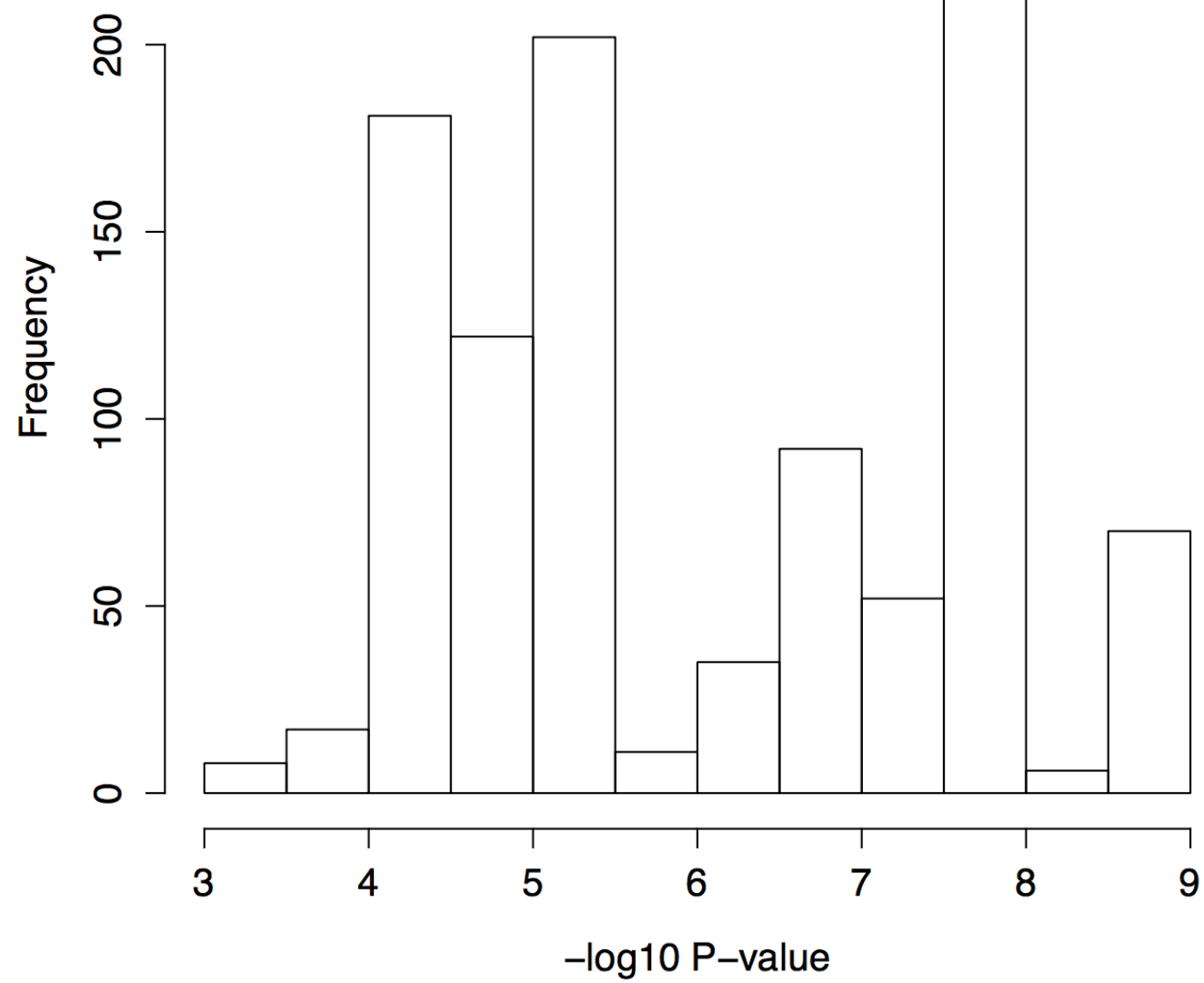


Figure E3

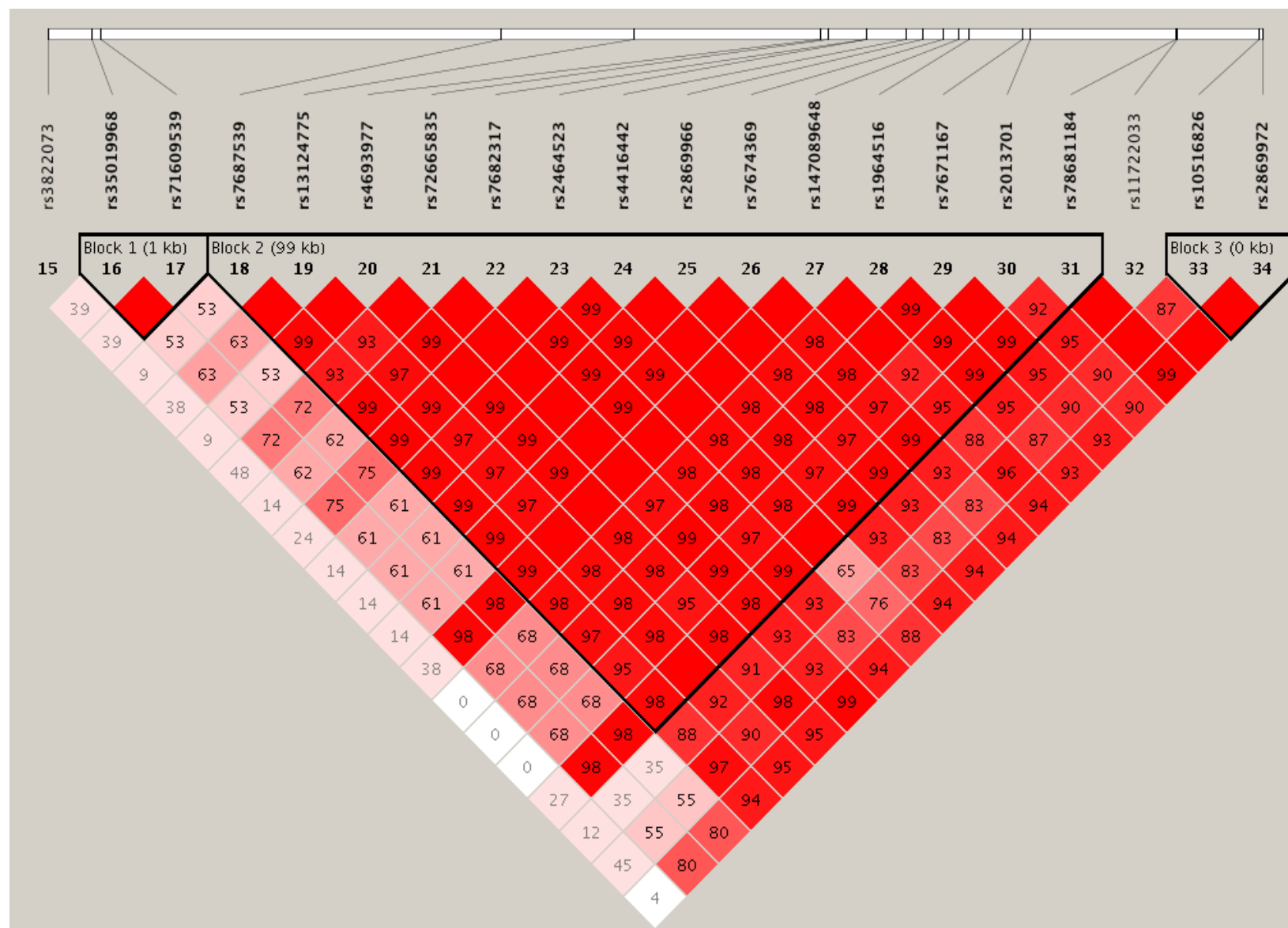
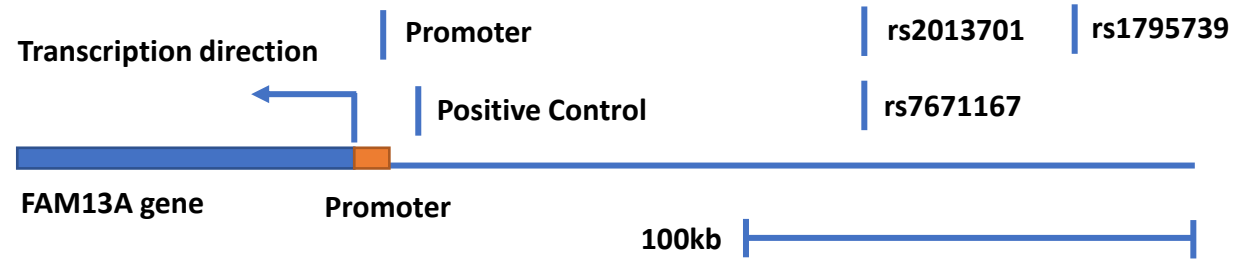


Figure E4

A



B

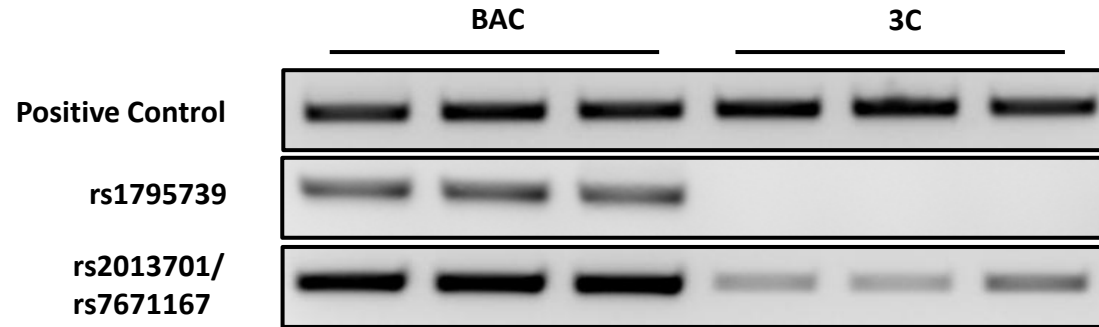


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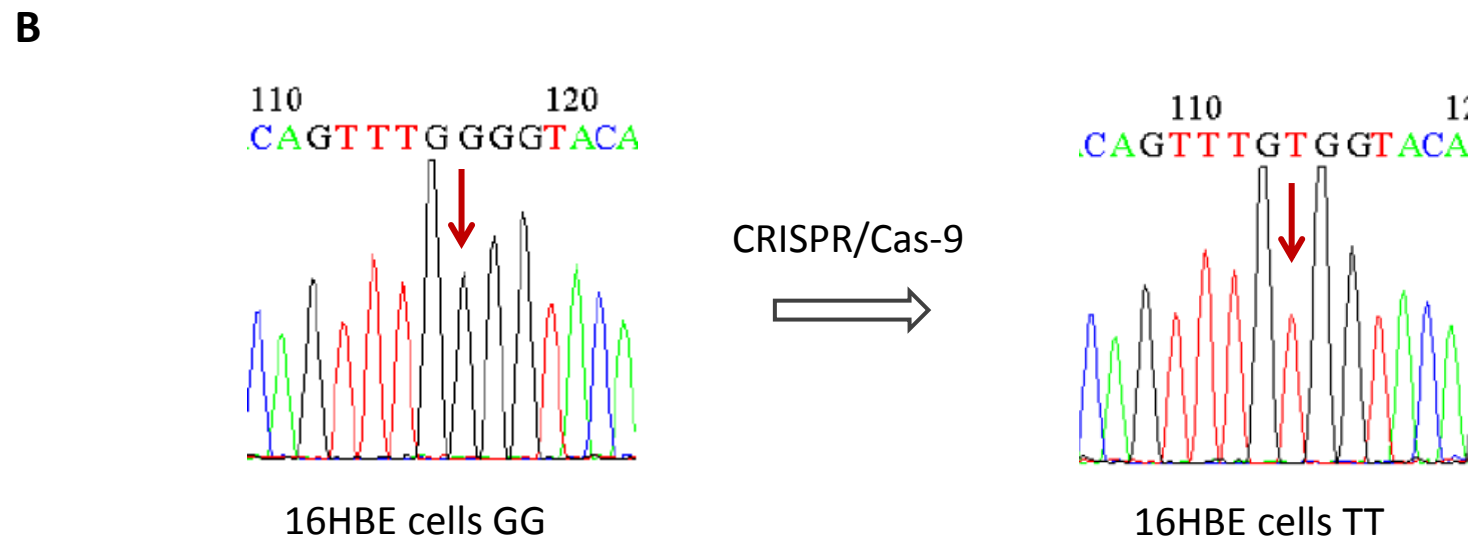
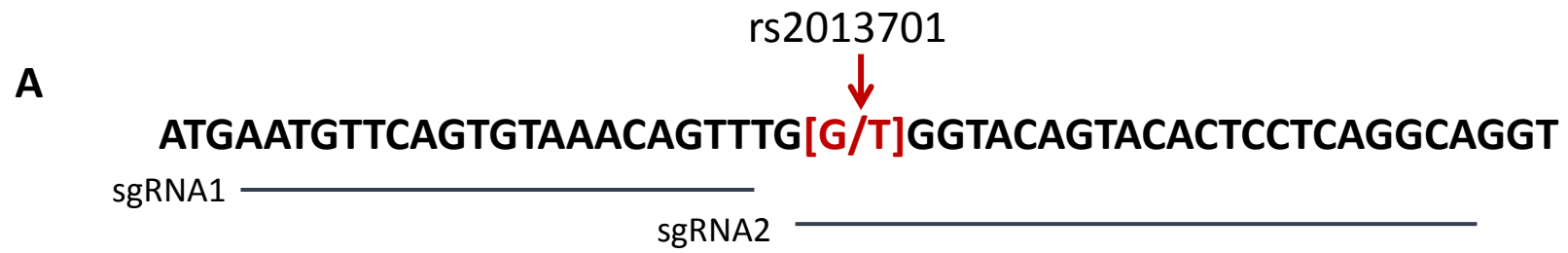


Figure E6

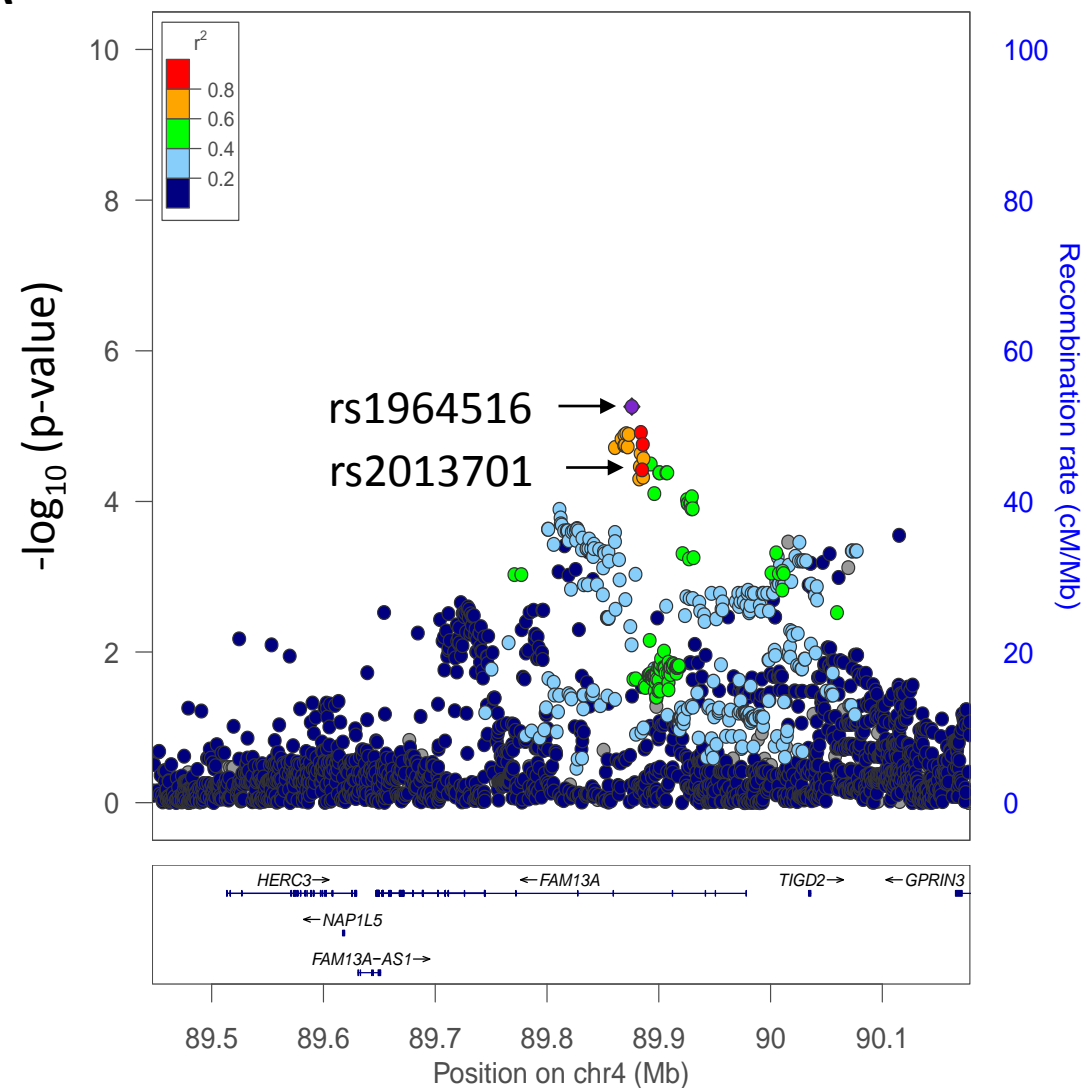
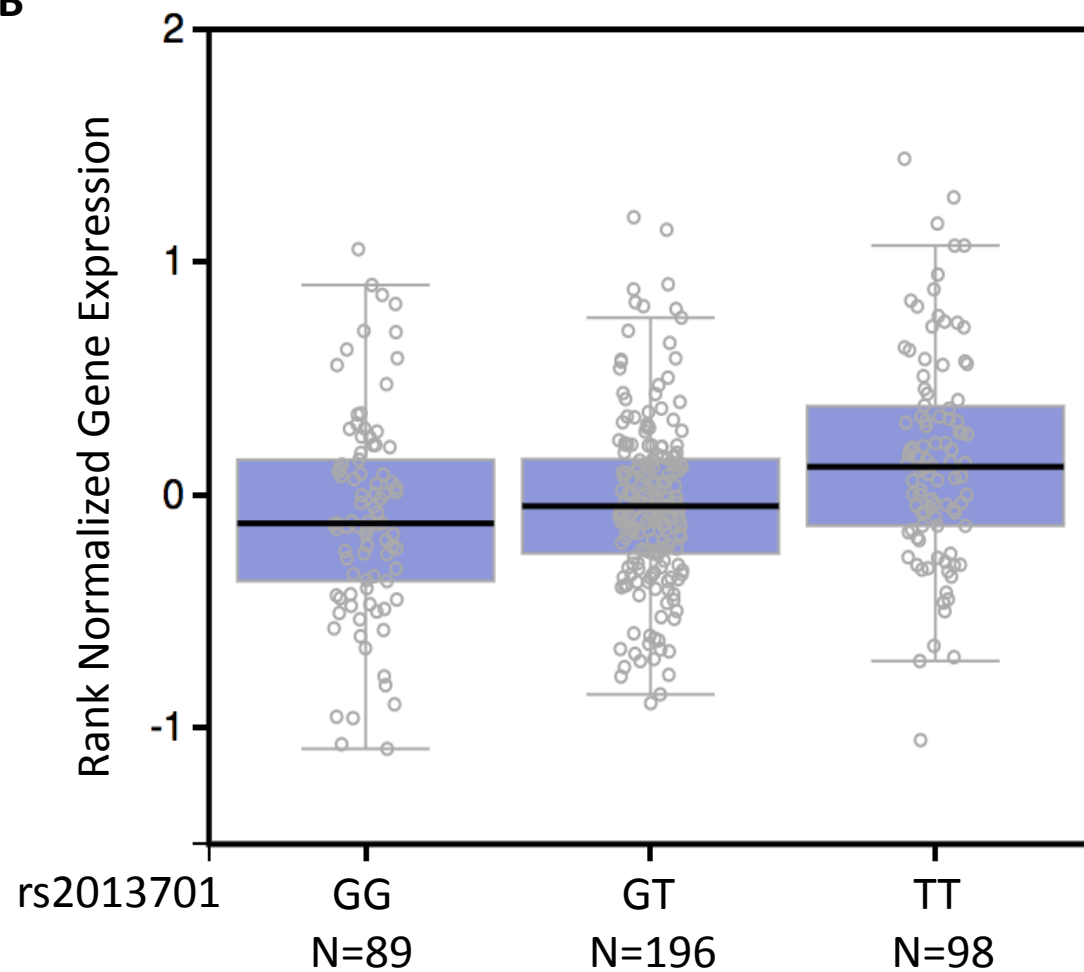
A**B**

Figure E7

Table E1

SNP	LOC	Orientation	Allele	median minP1	q value minP1	median SV40	q value SV40
rs10001319	L	RC	T	0.17	6.75E-07	0.2	4.95E-07
rs10001319	C	RC	T	0.13	1.09E-06	0.17	7.53E-07
rs10001319	C	RC	A	0.15	4.96E-06	0.18	6.25E-04
rs10001319	L	RC	A	0.29	7.39E-05	0.36	3.84E-04
rs10001319	R	RC	T	0.26	1.58E-04	0.17	1.36E-04
rs10001319	L	F	A	3.3	3.70E-04	2.98	1.41E-02
rs10001319	R	F	A	4.68	6.37E-04	4.78	7.86E-03
rs10001319	C	F	A	5.48	1.62E-03	5.34	3.26E-03
rs10001319	L	F	T	5.83	5.32E-03	6.2	5.67E-03
rs10001319	R	RC	A	0.3	1.65E-02	0.29	1.81E-03
rs10001319	R	F	T	5.45	1.65E-02	6.58	4.53E-02
rs10004795	C	RC	A	3.62	3.70E-04	6.14	4.78E-03
rs10004795	C	F	T	0.36	5.83E-04	0.39	1.41E-02
rs10004795	L	F	A	1.53	1.42E-03	1.45	1.59E-03
rs10004795	L	F	T	1.71	5.57E-03	1.37	2.02E-02
rs10006121	C	RC	G	0.21	4.96E-06	0.32	1.55E-05
rs10006121	C	RC	A	0.28	8.77E-03	0.32	4.63E-02
rs10012624	L	F	A	5.54	4.96E-06	3.99	2.03E-02
rs10012624	L	RC	A	0.33	1.62E-03	0.29	3.34E-02
rs10013481	C	F	T	0.25	1.74E-06	0.31	8.09E-05
rs10013481	C	F	C	0.22	4.96E-06	0.17	4.78E-05
rs10019681	C	RC	T	7.44	6.75E-07	7.69	1.55E-05
rs10019681	C	RC	C	7.73	4.96E-06	10.08	5.48E-06
rs10019681	C	F	T	0.15	4.90E-05	0.12	5.48E-06
rs10019681	C	F	C	0.19	1.23E-04	0.17	1.91E-06
rs10019681	L	F	T	0.2	9.14E-04	0.19	5.45E-05
rs10019681	L	F	C	0.21	3.00E-02	0.16	1.81E-03
rs10021465	L	RC	G	2.8	4.90E-02	4.34	1.30E-02
rs10022272	L	F	A	0.36	7.31E-03	0.28	1.68E-05
rs10024506	R	RC	G	0.23	2.82E-04	0.13	2.12E-03
rs10024506	C	RC	G	0.23	3.70E-04	0.3	9.12E-03
rs10024506	C	RC	C	0.16	9.12E-03	0.24	1.23E-03
rs10030965	R	F	C	0.29	1.74E-06	0.42	9.77E-06
rs10030965	R	RC	A	14.08	1.56E-05	12.64	1.75E-04
rs10030965	R	RC	C	8.26	2.82E-04	10.5	1.23E-03
rs10030965	L	RC	A	0.52	1.92E-02	0.51	3.92E-02
rs10031518	C	F	T	1.57	1.78E-02	1.93	1.30E-02
rs1020592	C	RC	G	1.92	1.30E-02	2.2	4.87E-02
rs10446696	L	RC	T	0.32	4.32E-05	0.29	2.02E-02
rs10470936	L	F	A	0.16	3.60E-07	0.14	3.52E-07
rs10470936	L	F	G	0.12	1.74E-06	0.21	1.91E-06
rs10470936	R	RC	A	1.43	4.06E-02	1.49	9.39E-03
rs10516821	R	RC	T	0.12	4.96E-06	0.47	2.76E-05
rs10516821	C	RC	T	0.23	5.83E-04	0.12	4.78E-05
rs10516826	C	RC	C	0.19	4.76E-07	0.2	1.91E-06
rs10516826	R	RC	T	0.24	4.96E-06	0.29	1.21E-06
rs10516826	L	RC	T	0.27	8.89E-06	0.07	7.53E-07
rs10516826	C	RC	T	0.14	2.53E-05	0.2	1.55E-05

rs10516826	L	F	C	10.76	4.90E-05	8.29	5.45E-05
rs10516826	L	RC	C	0.18	7.39E-05	0.1	4.95E-07
rs10516826	L	F	T	11.51	5.08E-04	10.21	1.75E-04
rs1059122	R	F	A	0.35	8.73E-05	0.51	3.02E-03
rs1059122	R	F	T	0.21	2.82E-04	0.41	4.78E-03
rs11097207	L	RC	A	0.27	1.65E-02	0.33	4.53E-02
rs112542013	L	F	T	0.31	4.32E-05	0.5	2.13E-02
rs112542013	L	F	C	0.31	9.69E-04	0.58	4.63E-02
rs112818517	C	RC	A	0.28	3.70E-04	0.12	1.68E-05
rs112818517	C	RC	G	0.21	1.08E-03	0.12	8.09E-05
rs115743183	C	RC	C	0.25	1.74E-06	0.3	3.27E-06
rs115743183	C	RC	A	0.23	4.96E-06	0.18	4.78E-05
rs11722033	R	RC	A	2.41	2.11E-04	3.28	3.85E-03
rs11722033	C	RC	A	3.17	8.77E-03	3.79	1.38E-03
rs11722033	C	F	A	0.56	8.77E-03	0.66	9.39E-03
rs11724744	C	RC	G	3.5	1.21E-02	2.88	3.02E-03
rs11725153	R	F	A	6.14	4.90E-05	4.11	1.81E-03
rs11725153	R	F	G	8.53	3.52E-04	7.44	3.27E-06
rs11725153	C	RC	G	0.25	2.93E-03	0.16	1.03E-03
rs11729108	R	F	T	0.26	5.57E-03	0.19	5.93E-03
rs11729108	C	F	T	0.25	2.61E-02	0.14	3.26E-03
rs11735482	L	F	C	0.36	2.93E-03	0.19	5.67E-04
rs11737016	L	F	T	5.35	4.76E-07	7.15	3.27E-06
rs11737016	L	RC	T	0.23	6.75E-07	0.28	9.12E-06
rs11737016	L	RC	C	0.3	6.75E-07	0.34	4.95E-07
rs11737016	L	F	C	3.96	4.41E-05	5.08	7.53E-07
rs11737260	R	RC	T	0.25	2.78E-05	0.28	3.25E-02
rs11737260	R	RC	A	0.3	1.89E-03	0.16	7.19E-04
rs11737515	L	RC	G	1.64	9.12E-04	1.57	3.92E-02
rs1246629	L	F	T	2.84	5.57E-03	3.41	4.78E-05
rs1246629	L	F	C	2.12	3.64E-02	2.18	6.00E-03
rs1246631	L	RC	G	0.57	3.64E-02	0.47	9.28E-03
rs12498498	R	F	A	0.13	4.76E-07	0.15	3.93E-07
rs12498498	R	F	T	0.18	6.75E-07	0.19	5.48E-06
rs12498498	R	RC	T	3.07	9.69E-04	4.7	1.41E-02
rs12498498	L	RC	T	3.46	1.89E-03	2.43	3.26E-03
rs12498498	C	F	T	0.33	1.21E-02	0.2	4.78E-05
rs12508524	R	RC	A	0.25	2.14E-04	0.18	3.53E-03
rs12508524	R	RC	G	0.32	9.69E-04	0.31	1.42E-02
rs12509305	L	RC	C	0.23	6.75E-07	0.15	1.21E-06
rs12509305	L	RC	T	0.2	1.56E-05	0.12	1.91E-06
rs12509305	R	F	C	1.79	8.77E-03	2.31	2.97E-02
rs12640018	R	RC	A	0.45	2.82E-04	0.33	1.01E-03
rs12640018	R	F	A	0.45	9.12E-04	0.35	1.01E-03
rs12640018	R	F	G	0.52	2.27E-03	0.54	8.09E-05
rs12643428	C	F	T	2.48	3.00E-02	2.75	3.37E-02
rs12643834	R	F	C	2.62	1.62E-03	3.87	5.67E-03
rs12643834	R	F	T	5.19	3.24E-03	4.96	7.86E-03
rs12643834	R	RC	T	0.38	3.24E-03	0.51	2.16E-02
rs12643834	R	RC	C	0.23	2.04E-02	0.41	4.32E-02

rs12645124	R	RC	A	0.29	3.60E-07	0.3	1.19E-04
rs12645124	L	RC	A	0.14	6.37E-04	0.17	3.08E-04
rs12645124	L	RC	T	0.14	9.14E-04	0.2	5.67E-03
rs12645173	R	F	A	3.16	2.66E-05	2.66	9.28E-03
rs12645240	R	RC	A	3.41	8.89E-06	5.11	9.12E-03
rs12645240	R	RC	G	5.76	2.04E-02	6.57	4.78E-03
rs12647781	L	RC	A	0.45	8.74E-06	0.63	5.15E-04
rs12647781	C	RC	A	0.22	5.08E-04	0.17	3.53E-03
rs12647781	R	RC	A	0.22	1.89E-03	0.18	3.25E-02
rs12649368	C	RC	C	0.33	9.69E-04	0.17	6.50E-04
rs12649368	L	RC	C	0.23	2.93E-03	0.25	4.53E-02
rs12649368	R	RC	C	0.29	3.24E-03	0.15	1.23E-03
rs12649368	R	RC	T	0.35	2.04E-02	0.46	2.23E-03
rs13110067	L	RC	G	2.28	3.70E-03	3.79	4.78E-05
rs13110067	L	RC	A	2.88	4.06E-02	2.45	4.32E-02
rs13113298	R	RC	T	4.57	1.74E-06	4.01	3.52E-07
rs13113298	R	RC	C	4.18	3.01E-06	5.12	3.93E-07
rs13115763	L	RC	T	0.23	1.62E-03	0.1	1.36E-04
rs13115763	L	RC	C	0.26	1.35E-02	0.11	2.76E-05
rs13129885	C	F	A	0.46	2.97E-02	0.43	9.39E-03
rs13130	C	RC	A	1.74	2.56E-02	1.63	2.74E-02
rs13138280	L	F	G	0.25	1.49E-05	0.11	4.95E-07
rs13138280	L	F	A	0.28	6.37E-04	0.16	4.96E-02
rs13138280	C	F	A	0.2	1.62E-03	0.09	1.36E-04
rs13138927	L	RC	T	0.22	9.14E-04	0.4	3.53E-03
rs13138927	L	F	T	4.86	5.32E-03	4.04	1.08E-03
rs13140481	L	RC	C	0.72	9.12E-04	0.7	4.87E-02
rs13140481	C	RC	T	0.51	2.56E-02	0.42	1.41E-02
rs13435721	R	RC	A	2.41	2.00E-02	3.22	4.63E-02
rs1377290	L	F	C	0.3	3.01E-06	0.27	1.91E-06
rs1377290	R	F	C	0.29	4.32E-05	0.2	5.67E-03
rs1377290	L	F	T	0.46	7.39E-05	0.55	1.36E-04
rs1377290	C	F	C	0.28	1.08E-03	0.19	5.45E-05
rs1377290	R	F	T	0.32	1.24E-03	0.28	2.97E-02
rs1377290	C	F	T	0.38	3.24E-03	0.15	1.81E-03
rs1379934	L	RC	T	0.39	5.57E-03	0.38	3.37E-02
rs1398940	L	F	G	12.32	1.49E-05	14.24	1.21E-06
rs1398940	L	F	A	16.06	8.73E-05	13.79	3.53E-03
rs1398940	L	RC	G	0.2	1.89E-03	0.24	3.21E-02
rs1398940	R	RC	G	2.16	2.79E-02	1.88	4.32E-02
rs1398942	L	F	A	5.44	1.09E-06	4.71	1.91E-06
rs1398942	L	F	G	5.22	3.01E-06	6.53	1.38E-03
rs1458557	R	F	A	1.92	2.04E-02	1.91	4.63E-02
rs1458560	C	RC	G	0.16	4.96E-06	0.22	8.55E-04
rs1458560	C	RC	T	0.25	2.11E-04	0.18	1.38E-03
rs1458562	L	RC	T	0.43	1.34E-02	0.56	2.02E-02
rs1513819	C	F	T	0.23	3.60E-07	0.27	5.48E-06
rs1513819	L	F	T	0.51	4.96E-06	0.43	3.95E-03
rs1513819	L	RC	T	6.56	2.78E-05	8.21	6.50E-04
rs1513819	C	F	G	0.6	5.57E-03	0.56	1.59E-03

rs1513819	R	F	T	0.4	2.04E-02	0.31	1.38E-03
rs1513819	R	RC	T	1.85	2.79E-02	2.37	2.50E-03
rs1563688	R	RC	T	3.52	4.32E-05	3.36	1.08E-03
rs1563688	R	RC	C	3.71	4.41E-05	3.79	9.12E-06
rs1563689	R	F	T	0.16	1.74E-06	0.18	7.53E-07
rs1563689	R	F	G	0.16	4.96E-06	0.16	4.95E-07
rs1563689	L	F	T	0.3	2.89E-02	0.27	4.53E-02
rs1588730	C	F	A	0.37	2.93E-03	0.14	7.19E-04
rs1588730	R	RC	A	1.71	8.64E-03	1.75	6.25E-04
rs17014307	C	RC	A	0.25	1.23E-04	0.24	2.97E-02
rs17014307	C	RC	G	0.41	1.23E-04	0.48	1.41E-02
rs17014483	C	F	T	0.35	8.74E-06	0.23	9.12E-06
rs17014483	C	F	C	0.49	9.09E-06	0.37	1.21E-06
rs17014483	L	F	C	1.69	4.68E-02	1.95	1.88E-02
rs17014616	R	F	A	0.19	8.74E-06	0.2	1.36E-04
rs17014616	R	F	T	0.14	4.90E-05	0.12	2.76E-05
rs17014616	C	F	A	0.22	8.73E-05	0.16	9.67E-06
rs17014616	L	F	T	0.16	5.08E-04	0.34	2.79E-02
rs17014616	L	F	A	0.18	5.08E-04	0.42	3.53E-03
rs17015052	R	RC	A	0.27	2.78E-05	0.2	2.29E-04
rs17015052	L	RC	G	2.24	9.12E-04	1.86	2.74E-02
rs17015052	L	RC	A	2.61	1.42E-03	2.07	2.02E-02
rs1708667	R	F	T	0.14	3.60E-07	0.16	3.27E-06
rs1708667	R	F	G	0.17	4.76E-07	0.18	4.95E-07
rs1708668	L	RC	A	0.54	4.90E-02	0.49	1.81E-03
rs1708670	R	RC	A	0.26	2.66E-05	0.31	5.15E-04
rs1708670	R	F	G	1.78	6.51E-05	2.14	3.52E-07
rs1708670	C	F	A	0.42	1.06E-04	0.38	6.00E-03
rs1708670	R	F	A	2.33	2.82E-04	2.45	4.78E-05
rs1708670	R	RC	G	0.31	8.48E-03	0.19	8.09E-05
rs17747153	R	F	G	0.19	1.09E-06	0.26	3.84E-04
rs17747153	R	F	T	0.21	8.89E-06	0.19	2.29E-04
rs17815876	C	RC	G	0.66	3.64E-02	0.56	1.39E-02
rs17822121	C	F	T	0.28	1.58E-04	0.16	3.53E-03
rs17822121	L	RC	C	1.66	1.42E-03	1.92	2.02E-02
rs17822121	C	F	C	0.27	5.32E-03	0.32	3.53E-03
rs17822121	L	RC	T	1.5	1.30E-02	1.65	3.95E-03
rs1795720	R	RC	C	0.31	3.01E-06	0.37	3.08E-04
rs1795720	R	F	T	0.71	4.85E-02	0.41	1.23E-03
rs1795727	R	RC	C	1.91	1.24E-03	1.86	1.41E-02
rs1795734	R	F	A	0.2	8.73E-05	0.13	1.36E-04
rs1795734	C	F	C	0.2	5.08E-04	0.28	3.53E-03
rs1795734	C	F	A	0.15	9.14E-04	0.21	3.10E-05
rs1795734	R	F	C	0.16	2.93E-03	0.16	1.68E-05
rs1795738	L	F	T	0.44	6.51E-05	0.78	4.87E-02
rs1795738	R	RC	T	0.23	3.70E-04	0.26	8.09E-05
rs1795739	L	F	A	3.54	3.70E-04	3.63	4.78E-03
rs1795739	C	F	G	0.21	2.72E-03	0.09	1.36E-04
rs1795739	R	F	A	2.89	2.04E-02	3.06	1.42E-02
rs1817279	L	RC	C	0.37	4.76E-07	0.2	3.93E-07

rs1817279	L	RC	A	0.38	2.56E-02	0.28	3.95E-03
rs1849597	R	F	A	2.21	5.57E-03	1.57	3.95E-03
rs1903002	R	F	C	0.32	9.12E-03	0.23	1.03E-03
rs1903004	C	F	G	0.73	2.56E-02	0.7	1.08E-03
rs1903007	R	RC	A	0.63	1.34E-02	0.66	4.32E-02
rs1921679	R	RC	T	0.2	3.60E-07	0.23	3.27E-06
rs1921679	C	RC	C	0.27	4.76E-07	0.34	1.91E-06
rs1921679	R	RC	C	0.19	1.09E-06	0.26	5.48E-06
rs1921679	C	RC	T	0.27	3.01E-06	0.46	1.91E-04
rs1921679	C	F	T	4.14	2.82E-04	9.4	5.93E-03
rs1921679	C	F	C	4.31	3.52E-04	4.34	1.36E-04
rs1921680	R	RC	C	0.49	4.54E-03	0.47	1.41E-02
rs1921680	C	F	C	3.22	4.77E-02	3.34	3.34E-02
rs1921684	C	F	T	0.28	3.60E-07	0.37	1.91E-06
rs1921684	C	RC	T	2.71	6.75E-07	3.72	4.78E-05
rs1921684	C	F	C	0.33	1.09E-06	0.31	4.95E-07
rs1921684	R	F	C	0.33	1.49E-05	0.15	1.91E-06
rs1921684	R	F	T	0.28	2.11E-04	0.12	7.53E-07
rs1921684	C	RC	C	2.74	5.59E-04	3.51	1.91E-06
rs1921684	R	RC	T	1.95	8.64E-03	2.4	6.25E-04
rs1921684	R	RC	C	1.65	2.79E-02	2.18	2.50E-03
rs1947379	C	F	G	0.18	1.49E-05	0.22	2.23E-03
rs1947379	L	F	G	0.24	4.90E-05	0.2	1.36E-04
rs1947379	L	F	A	0.18	2.93E-03	0.22	1.30E-02
rs1961979	L	RC	C	0.63	9.12E-04	0.51	2.64E-03
rs1964516	L	F	T	1.63	9.09E-06	1.62	3.84E-04
rs1979290	C	F	T	3.02	4.46E-02	2.55	9.39E-03
rs2013701	L	F	T	0.15	3.60E-07	0.15	3.52E-07
rs2013701	C	F	T	0.12	4.96E-06	0.18	9.12E-06
rs2013701	L	F	G	0.45	9.12E-04	0.49	1.01E-03
rs2045516	R	F	T	0.22	4.96E-06	0.38	2.32E-04
rs2045516	R	F	C	0.25	2.53E-05	0.24	3.27E-06
rs2085600	L	F	G	0.31	3.52E-04	0.07	1.91E-06
rs2085600	L	F	A	0.51	1.62E-03	0.06	4.95E-07
rs2085601	R	RC	C	4.08	6.37E-04	3.83	1.81E-03
rs2085601	R	RC	A	3.63	2.01E-03	3.71	6.50E-04
rs2085601	L	RC	C	5.7	7.31E-03	4.93	1.23E-03
rs2090031	R	F	C	0.59	8.77E-03	0.42	3.21E-02
rs2090031	R	F	T	0.73	3.64E-02	0.7	2.74E-02
rs2100679	R	F	G	0.56	1.30E-02	0.54	1.39E-02
rs2100679	L	F	G	0.5	2.79E-02	0.64	9.39E-03
rs2100679	C	RC	G	1.75	4.06E-02	1.78	1.38E-03
rs2125409	R	RC	G	0.17	1.56E-05	0.23	1.08E-03
rs2167750	C	RC	T	0.26	6.75E-07	0.24	2.64E-03
rs2167750	R	RC	T	0.27	7.09E-07	0.34	7.25E-05
rs2167750	L	RC	T	0.25	1.09E-06	0.31	8.55E-04
rs2167750	C	F	T	3.08	1.49E-05	4.06	1.55E-05
rs2167750	R	F	T	1.76	4.90E-02	2.21	3.37E-02
rs2178583	R	RC	T	0.48	2.82E-04	0.52	1.01E-03
rs2178584	R	RC	T	0.55	2.01E-03	0.44	5.15E-04

rs2178586	C	RC	C	0.3	6.75E-07	0.28	3.27E-06
rs2178586	C	RC	T	0.4	1.49E-05	0.34	1.91E-06
rs2178586	L	F	C	2.74	7.71E-04	3.49	3.85E-03
rs2276936	R	RC	C	0.13	3.60E-07	0.17	3.52E-07
rs2276936	R	RC	A	0.22	4.76E-07	0.21	5.48E-06
rs2276936	R	F	C	5.23	4.41E-05	5.37	3.52E-07
rs2276936	L	RC	C	0.21	3.52E-04	0.19	1.55E-05
rs2446300	L	F	T	3.04	7.31E-03	3.68	9.12E-03
rs2446301	C	RC	T	0.25	8.73E-05	0.31	4.78E-03
rs2446301	C	RC	G	0.26	1.92E-02	0.14	7.86E-03
rs2446301	R	F	T	0.53	2.00E-02	0.5	3.21E-02
rs2464514	L	F	A	0.26	3.60E-07	0.18	9.77E-06
rs2464514	L	F	C	0.22	3.01E-06	0.2	3.52E-07
rs2464514	C	F	A	0.26	7.39E-05	0.26	3.27E-06
rs2464514	C	F	C	0.25	1.23E-04	0.35	2.23E-03
rs2464520	L	F	G	2.5	1.92E-02	1.89	7.86E-03
rs2464523	C	F	T	0.44	4.75E-04	0.48	9.39E-03
rs2464523	L	F	T	0.37	2.01E-03	0.36	1.38E-03
rs2464528	L	RC	A	0.19	8.73E-05	0.42	3.53E-03
rs2464528	L	RC	C	0.14	2.82E-04	0.22	1.75E-04
rs2602117	C	RC	C	0.59	2.27E-03	0.58	3.85E-03
rs2609258	L	F	C	1.5	1.30E-02	1.55	3.92E-02
rs2609259	L	RC	A	0.32	4.76E-07	0.34	2.64E-03
rs2609259	L	RC	C	0.29	4.76E-07	0.44	1.59E-03
rs2609259	C	RC	C	0.26	9.12E-03	0.27	9.77E-03
rs2609259	C	F	A	7.12	1.65E-02	6.35	1.67E-02
rs2609260	C	F	T	1.43	5.57E-03	1.85	6.00E-03
rs2609261	R	F	G	3.98	7.39E-05	4.6	1.41E-02
rs2609261	R	F	A	2.59	5.83E-04	3.12	2.29E-04
rs2609261	L	F	G	2.46	5.57E-03	2.44	2.64E-03
rs2609261	L	F	A	2.04	5.57E-03	2.51	9.12E-06
rs2609264	L	F	C	0.16	3.60E-07	0.14	4.95E-07
rs2609264	L	F	T	0.16	2.82E-04	0.15	1.68E-05
rs2609264	L	RC	C	3.36	5.57E-03	3.91	4.78E-03
rs2609280	R	RC	G	0.47	4.41E-05	0.5	1.59E-03
rs2609280	R	RC	A	0.47	5.57E-03	0.59	5.48E-06
rs2609282	R	RC	A	0.35	3.52E-04	0.47	9.39E-03
rs2609282	R	RC	G	0.56	5.57E-03	0.65	4.32E-02
rs2670623	C	F	G	5.23	3.00E-02	3.92	2.03E-02
rs2704571	C	F	G	0.11	3.60E-07	0.21	9.12E-06
rs2704571	C	F	A	0.17	6.75E-07	0.25	4.78E-05
rs2704571	R	F	G	0.66	3.70E-03	0.76	3.92E-02
rs2704574	C	RC	T	0.47	2.56E-02	0.42	2.32E-04
rs2704576	L	F	T	3.13	1.34E-02	1.72	3.21E-02
rs2704577	R	RC	C	0.24	8.89E-06	0.2	1.68E-05
rs2704577	R	RC	T	0.34	6.37E-04	0.27	2.12E-03
rs2704577	L	RC	T	0.2	9.12E-03	0.42	9.77E-03
rs2704577	R	F	T	3.71	1.92E-02	6.77	1.81E-03
rs2704577	R	F	C	2.33	3.08E-02	2.25	2.16E-02
rs2704581	R	F	A	0.21	1.62E-03	0.15	1.81E-03

rs2704582	L	F	T	0.31	3.60E-07	0.33	9.77E-06
rs2704582	L	F	C	0.22	4.76E-07	0.27	4.78E-05
rs2704589	C	RC	T	1.93	1.35E-02	1.55	4.63E-02
rs2704604	C	F	A	0.27	2.93E-03	0.18	4.05E-04
rs2704604	C	F	G	0.22	1.65E-02	0.25	5.93E-03
rs28379646	R	RC	T	0.39	7.31E-03	0.22	1.41E-02
rs28379646	R	RC	C	0.31	1.34E-02	0.28	3.34E-02
rs28459962	C	RC	C	3.74	2.72E-03	4.59	2.16E-02
rs28529050	L	F	G	0.33	4.32E-05	0.26	6.00E-03
rs28529050	L	F	A	0.39	1.23E-04	0.28	6.50E-04
rs28540701	C	F	A	2.79	4.41E-05	3.89	9.12E-06
rs28540701	C	F	G	3.6	4.75E-04	3.65	5.48E-06
rs2860420	C	RC	A	0.21	1.09E-06	0.36	3.08E-04
rs2860420	R	RC	A	0.17	4.96E-06	0.26	1.36E-04
rs2860420	C	RC	G	0.28	1.56E-05	0.45	2.64E-03
rs2860420	R	RC	G	0.3	2.53E-05	0.37	1.38E-03
rs2860420	R	F	A	2.12	4.06E-02	2.6	3.85E-03
rs2860468	L	F	T	0.18	3.60E-07	0.18	1.21E-06
rs2860468	C	F	T	0.2	1.09E-06	0.26	8.55E-04
rs2860468	L	F	C	0.61	7.39E-05	0.54	5.15E-04
rs2860468	R	F	C	0.37	9.69E-04	0.41	2.16E-02
rs2860468	C	RC	T	4.23	1.34E-02	4.78	4.78E-03
rs2860500	C	RC	T	0.13	8.73E-05	0.12	5.48E-06
rs2860500	C	RC	C	0.15	5.08E-04	0.26	5.48E-06
rs2860528	R	F	A	2.72	3.58E-03	2.59	8.55E-04
rs2869948	R	RC	T	3.23	2.97E-02	3.66	5.67E-03
rs2869968	C	RC	A	6.06	1.08E-03	4.04	1.75E-04
rs2869968	R	F	G	0.51	3.58E-03	0.51	4.32E-02
rs2869972	C	F	A	0.18	1.74E-06	0.24	5.48E-06
rs2869972	R	F	A	0.34	4.96E-06	0.31	1.91E-04
rs2869972	R	F	G	0.53	2.14E-04	0.63	3.95E-03
rs2869972	L	RC	A	7.95	9.69E-04	5.33	9.77E-03
rs2869972	C	RC	G	3.17	1.89E-03	5.96	3.37E-02
rs2869972	L	RC	G	2.87	3.70E-03	5.31	4.78E-05
rs2869972	L	F	A	0.44	5.57E-03	0.34	6.00E-03
rs2869974	R	RC	C	0.24	6.75E-07	0.36	7.53E-07
rs2869974	R	RC	T	0.26	6.75E-07	0.3	9.12E-06
rs2869974	C	F	T	9.28	1.09E-06	14.91	5.48E-06
rs2869974	R	F	T	8.73	1.74E-06	10.39	9.67E-06
rs2869974	C	F	C	9.72	4.96E-06	12.41	3.27E-06
rs2869974	R	F	C	8.75	1.56E-05	13.52	1.75E-04
rs2869974	C	RC	C	0.35	1.23E-04	0.33	1.38E-03
rs2869974	L	RC	C	0.21	1.62E-03	0.21	9.12E-03
rs2869974	C	RC	T	0.2	1.62E-03	0.16	1.08E-03
rs2869974	L	F	C	3.58	9.12E-03	2.42	1.30E-02
rs2904163	R	RC	G	0.35	1.56E-05	0.31	4.63E-02
rs2904163	R	RC	A	0.15	4.90E-05	0.16	5.48E-06
rs2904163	L	RC	A	0.27	2.11E-04	0.07	3.93E-07
rs2904163	C	RC	A	0.17	1.62E-03	0.2	1.67E-02
rs2904163	L	F	G	2.32	2.89E-02	3.09	4.53E-02

rs2904255	C	RC	T	4.03	6.37E-04	4.15	8.09E-05
rs2904259	R	RC	C	0.17	4.76E-07	0.16	7.53E-07
rs2904259	R	RC	T	0.22	1.09E-06	0.2	4.95E-07
rs2904259	C	RC	T	0.35	4.31E-02	0.29	3.26E-03
rs2904259	R	F	C	5.79	4.85E-02	6.66	9.77E-03
rs2904261	L	F	G	0.15	4.96E-06	0.24	1.55E-05
rs2904261	C	F	G	0.19	4.90E-05	0.13	5.45E-05
rs2904261	L	F	A	0.15	4.90E-05	0.23	9.67E-06
rs2904261	C	RC	G	2.95	1.34E-02	3.89	2.23E-03
rs2904261	C	F	A	0.22	1.59E-02	0.11	7.86E-03
rs2915427	C	F	A	0.47	1.24E-03	0.3	1.38E-03
rs2924348	L	RC	G	0.13	3.60E-07	0.29	4.95E-07
rs2924348	L	RC	A	0.12	1.09E-06	0.31	7.53E-07
rs2924348	R	RC	A	0.34	9.12E-03	0.33	7.86E-03
rs2924348	C	RC	G	0.18	9.12E-03	0.27	3.26E-03
rs2924348	C	RC	A	0.25	1.65E-02	0.21	9.77E-03
rs2924348	R	RC	G	0.19	1.65E-02	0.21	1.01E-04
rs2924348	R	F	G	3.98	1.92E-02	3.56	2.03E-02
rs2924353	R	F	G	4.77	9.14E-04	10.38	1.75E-04
rs2924363	R	RC	T	0.36	3.70E-04	0.28	9.67E-06
rs2924363	R	RC	C	0.49	5.57E-03	0.47	2.02E-02
rs2924925	C	RC	C	1.79	5.57E-03	1.96	4.32E-02
rs2924935	C	RC	C	0.3	3.60E-07	0.2	3.52E-07
rs2924935	R	RC	C	0.28	3.60E-07	0.24	3.93E-07
rs2924935	C	RC	T	0.32	3.60E-07	0.26	3.93E-07
rs2924935	R	RC	T	0.32	3.01E-06	0.24	4.95E-07
rs2924935	L	F	T	0.39	7.39E-05	0.21	1.68E-05
rs2924935	L	RC	T	0.43	8.77E-03	0.39	2.29E-04
rs2924935	L	F	C	0.19	1.34E-02	0.21	5.15E-04
rs2924937	R	RC	C	0.11	6.75E-07	0.15	3.93E-07
rs2924937	C	RC	C	0.19	1.74E-06	0.09	3.27E-06
rs2924937	R	RC	G	0.17	4.96E-06	0.17	5.48E-06
rs2924937	L	F	C	3.94	1.89E-03	4.34	3.25E-02
rs2924937	L	RC	G	0.29	5.00E-02	0.45	9.77E-03
rs2924941	L	F	T	9.41	8.89E-06	10.05	1.75E-04
rs2924941	C	F	C	7.23	2.78E-05	6.21	3.53E-03
rs2924941	R	F	C	0.39	1.23E-04	0.44	8.55E-04
rs2924941	R	RC	T	2.06	1.74E-04	2.46	2.64E-03
rs2924941	L	F	C	11.61	2.14E-04	11.18	3.53E-03
rs2924941	C	F	T	7.53	1.89E-03	7.31	5.45E-05
rs2924941	R	RC	C	1.6	2.27E-03	1.96	4.32E-02
rs2972011	R	F	G	1.84	5.57E-03	1.99	2.13E-02
rs2972021	L	F	G	0.35	1.74E-06	0.45	5.48E-06
rs2972021	L	RC	G	6.15	4.96E-06	8.67	1.21E-06
rs2972021	L	RC	T	7.46	1.56E-05	5.52	2.32E-04
rs2972021	C	RC	T	0.54	4.32E-05	0.6	3.85E-03
rs2972021	L	F	T	0.4	1.06E-04	0.52	1.72E-03
rs2972028	L	RC	T	0.14	8.89E-06	0.17	1.91E-06
rs2972028	L	RC	C	0.27	4.54E-03	0.21	3.21E-02
rs2972038	L	F	C	0.42	2.01E-03	0.29	2.50E-03

rs3017900	R	F	C	2.19	7.31E-03	2.48	4.96E-02
rs3017901	L	RC	T	0.19	1.56E-05	0.15	1.68E-05
rs3017901	L	RC	C	0.15	8.73E-05	0.16	7.53E-07
rs3017901	R	RC	C	0.55	1.23E-04	0.44	3.08E-04
rs3017902	C	RC	G	0.15	1.58E-04	0.22	9.67E-06
rs3017902	C	RC	A	0.22	3.70E-04	0.25	3.02E-03
rs3017902	C	F	G	5.76	1.59E-02	4.15	1.03E-03
rs3017913	C	RC	A	0.13	4.76E-07	0.22	1.21E-06
rs3017913	R	RC	A	0.26	3.01E-06	0.14	3.27E-06
rs3017913	R	RC	G	0.48	1.23E-04	0.48	1.38E-03
rs3017913	C	RC	G	0.61	2.82E-04	0.53	1.39E-02
rs3017913	L	RC	A	0.22	6.37E-04	0.28	2.16E-02
rs3017913	L	F	A	3.13	5.57E-03	4.79	2.16E-02
rs3017914	L	F	T	2.87	8.73E-05	4.13	1.08E-03
rs3017914	C	RC	C	0.29	1.23E-04	0.3	2.29E-04
rs3017914	L	RC	C	0.33	1.08E-03	0.23	4.78E-05
rs3017914	L	F	C	4.07	4.54E-03	3.02	7.86E-03
rs3017914	L	RC	T	0.3	4.90E-02	0.23	4.78E-03
rs3017922	R	RC	G	5.62	1.23E-04	4.54	1.91E-06
rs3017925	L	F	A	0.17	8.73E-05	0.23	8.09E-05
rs3017925	L	F	G	0.17	2.14E-04	0.21	3.85E-03
rs33998578	L	F	C	0.57	1.92E-02	0.51	9.28E-03
rs34685087	C	F	T	1.99	2.79E-02	1.86	4.87E-02
rs34749134	C	F	T	2.24	5.57E-03	2.07	2.97E-02
rs35019968	C	RC	G	0.3	5.57E-03	0.46	3.84E-04
rs35019968	C	F	G	2.25	8.77E-03	2.39	6.00E-03
rs35019968	C	RC	C	0.43	2.79E-02	0.54	9.39E-03
rs35159286	C	RC	G	2.12	2.00E-02	1.86	1.41E-02
rs35232147	C	F	T	0.36	2.82E-04	0.51	6.00E-03
rs35232147	R	F	T	0.53	4.68E-02	0.51	4.87E-02
rs35652620	C	RC	T	0.6	9.12E-04	0.48	1.19E-04
rs36074996	R	F	A	5.04	2.82E-04	6.74	5.67E-03
rs36074996	L	F	A	2.69	3.52E-04	4.44	6.50E-04
rs36074996	L	F	G	3.1	5.59E-04	3.13	2.50E-03
rs36074996	C	F	G	4.51	9.12E-03	5.12	4.53E-02
rs36111123	L	RC	C	2.9	8.89E-06	2.09	3.34E-02
rs3756050	R	F	C	0.33	5.00E-02	0.15	4.53E-02
rs3775373	R	RC	G	2.64	2.00E-02	2.18	3.85E-03
rs3775417	L	F	C	0.29	1.23E-04	0.17	5.48E-06
rs3775417	C	F	G	0.6	2.27E-03	0.55	2.50E-03
rs3775417	L	F	G	0.28	5.32E-03	0.14	1.36E-04
rs3796658	L	F	A	0.23	5.08E-04	0.16	7.19E-04
rs3796658	L	F	G	0.2	3.24E-03	0.24	1.75E-04
rs3806788	L	RC	G	0.27	2.93E-03	0.19	5.93E-03
rs3806788	L	F	G	3.31	2.61E-02	2.4	9.77E-03
rs3822072	C	RC	G	0.6	2.56E-02	0.52	4.87E-02
rs3822073	L	RC	C	0.42	2.66E-05	0.39	6.25E-04
rs3822073	R	RC	C	0.26	4.32E-05	0.38	2.02E-02
rs3822073	L	F	C	3.44	2.82E-04	4.54	9.12E-06
rs3822076	L	RC	A	0.38	1.34E-02	0.29	4.78E-05

rs3822077	C	RC	A	0.63	2.79E-02	0.59	5.15E-04
rs3852086	R	F	A	0.51	5.57E-03	0.38	3.08E-04
rs4260503	C	RC	G	0.14	3.60E-07	0.21	1.91E-06
rs4260503	L	RC	G	0.28	3.01E-06	0.19	2.76E-05
rs4260503	R	RC	G	0.2	1.56E-05	0.15	2.29E-04
rs4260503	C	RC	A	0.16	2.82E-04	0.14	3.27E-06
rs4260503	R	RC	A	0.19	3.24E-03	0.21	3.08E-04
rs4285052	C	F	G	0.56	5.57E-03	0.56	1.39E-02
rs4325981	L	F	A	0.13	3.60E-07	0.14	3.93E-07
rs4325981	L	F	G	0.13	4.76E-07	0.15	7.53E-07
rs4425336	L	RC	G	0.45	1.42E-03	0.54	6.00E-03
rs4425336	L	RC	A	0.58	5.57E-03	0.53	1.01E-03
rs4505789	L	F	C	0.23	9.12E-03	0.35	1.67E-02
rs4505789	C	F	C	0.69	3.08E-02	0.41	3.53E-03
rs4642211	R	RC	C	0.24	6.75E-07	0.21	1.01E-03
rs4642211	L	RC	T	0.27	1.09E-06	0.32	8.55E-04
rs4642211	L	RC	C	0.2	1.74E-06	0.21	1.36E-04
rs4642211	R	F	T	5.26	1.56E-05	6.84	1.01E-04
rs4642211	R	RC	T	0.21	2.14E-04	0.21	1.08E-03
rs4693973	C	RC	T	0.14	3.60E-07	0.16	3.52E-07
rs4693973	C	RC	A	0.14	6.75E-07	0.15	4.95E-07
rs4693973	R	RC	T	0.2	2.53E-05	0.19	1.91E-06
rs4693973	R	RC	A	0.17	4.32E-05	0.16	8.09E-05
rs4693973	L	RC	T	0.3	1.62E-03	0.25	4.53E-02
rs4693973	C	F	T	3.47	5.00E-02	3.25	9.77E-03
rs4693975	L	F	T	1.57	1.42E-03	1.6	2.02E-02
rs4693978	C	F	C	0.39	4.75E-04	0.4	1.36E-04
rs4693978	C	F	A	0.54	8.77E-03	0.52	2.02E-02
rs4693981	L	RC	T	1.74	2.56E-02	1.5	2.74E-02
rs5029557	L	F	G	0.41	3.60E-07	0.28	3.93E-07
rs5029557	C	F	A	0.62	2.82E-04	0.42	8.09E-05
rs5029557	L	F	A	0.65	2.27E-03	0.4	9.12E-06
rs56158219	L	RC	A	0.46	2.27E-03	0.41	1.41E-02
rs56158219	R	F	G	3.65	4.31E-02	3.33	9.77E-03
rs56943497	L	F	T	0.32	3.01E-06	0.32	1.59E-03
rs56943497	L	F	C	0.28	8.74E-06	0.3	3.08E-04
rs57956471	R	RC	A	0.34	1.74E-06	0.4	2.50E-03
rs57956471	R	RC	C	0.35	3.08E-02	0.27	1.42E-02
rs58281712	R	RC	G	1.83	1.23E-04	2.02	8.09E-05
rs58281712	R	RC	C	1.84	2.79E-02	1.68	9.39E-03
rs59188553	R	RC	T	1.74	5.59E-04	1.8	1.19E-04
rs59268922	R	F	T	4.12	8.48E-03	3.77	6.50E-04
rs59268922	R	F	C	2.05	3.08E-02	1.98	4.63E-02
rs59473955	R	F	C	0.18	1.74E-06	0.24	1.55E-05
rs59473955	R	F	T	0.24	3.01E-06	0.26	8.55E-04
rs59924504	R	RC	C	0.21	3.60E-07	0.25	3.93E-07
rs59924504	R	RC	T	0.24	3.60E-07	0.24	3.93E-07
rs60107549	R	RC	T	0.38	2.00E-02	0.46	6.00E-03
rs60618725	R	F	T	0.54	3.08E-02	0.48	1.41E-02
rs60751124	L	RC	A	0.18	2.78E-05	0.25	1.36E-04

rs60751124	L	F	G	4.31	2.89E-02	5.58	5.67E-03
rs61737091	C	RC	T	2.22	2.79E-02	2.69	3.92E-02
rs62306363	L	RC	G	0.19	4.90E-05	0.12	3.10E-05
rs62306363	L	RC	A	0.14	1.58E-04	0.13	9.67E-06
rs62306390	R	F	A	0.21	1.74E-06	0.24	5.48E-06
rs62306390	C	F	A	0.13	8.89E-06	0.48	2.12E-03
rs62306391	R	RC	G	2.35	2.01E-03	2.48	2.50E-03
rs62308743	C	RC	T	0.32	9.69E-04	0.24	3.84E-04
rs62308743	C	RC	C	0.25	2.01E-03	0.25	1.91E-04
rs62308744	C	F	C	0.26	2.93E-03	0.33	9.77E-03
rs62308744	C	F	T	0.19	5.32E-03	0.27	5.93E-03
rs6532081	L	F	A	0.2	6.75E-07	0.13	7.53E-07
rs6532081	L	F	G	0.15	1.74E-06	0.1	9.12E-06
rs6532082	L	RC	A	2.92	5.57E-03	6.82	2.23E-03
rs6532091	C	RC	T	0.23	1.09E-06	0.31	1.55E-05
rs6532091	L	F	T	7.24	1.74E-06	5.99	5.48E-06
rs6532091	R	RC	T	0.16	4.90E-05	0.23	1.68E-05
rs6532091	R	RC	C	0.18	3.70E-04	0.17	1.36E-04
rs6532091	C	F	C	2.47	5.83E-04	4.64	1.81E-03
rs6532091	C	RC	C	0.23	7.71E-04	0.34	8.55E-04
rs6532091	R	F	T	6.53	9.12E-03	5.2	9.77E-03
rs6532091	L	F	C	5.13	2.04E-02	6.75	4.05E-04
rs6532102	R	RC	G	0.32	2.82E-04	0.49	1.39E-02
rs67287708	L	F	C	0.67	1.78E-02	0.44	1.88E-02
rs6814344	C	F	G	0.28	6.75E-07	0.29	1.21E-06
rs6814344	C	F	A	0.22	4.96E-06	0.24	1.59E-03
rs6814344	C	RC	A	7.07	8.89E-06	8.37	1.36E-04
rs6814344	R	F	A	0.29	1.23E-04	0.41	3.21E-02
rs6814344	R	RC	A	3.3	3.52E-04	6.85	2.29E-04
rs6814344	L	F	G	0.22	5.32E-03	0.2	5.67E-03
rs6814344	L	RC	A	13.48	5.32E-03	12.75	5.67E-04
rs6814344	C	RC	G	5.86	1.21E-02	7.02	3.25E-02
rs6814344	R	RC	G	2.21	2.97E-02	2.83	3.85E-03
rs6815370	L	RC	C	0.6	4.06E-02	0.46	3.08E-04
rs6815970	L	F	T	0.49	9.12E-04	0.63	2.74E-02
rs6815970	L	F	C	0.58	5.57E-03	0.74	4.87E-02
rs6822256	R	RC	A	0.21	3.01E-06	0.29	3.84E-04
rs6822256	R	RC	G	0.25	3.24E-03	0.37	5.67E-03
rs6824451	C	RC	G	3.54	1.24E-03	2.24	3.37E-02
rs6826407	C	F	T	0.42	4.75E-04	0.48	4.32E-02
rs6826407	C	F	C	0.28	1.24E-03	0.48	2.02E-02
rs6827857	L	F	A	0.19	3.60E-07	0.13	3.52E-07
rs6827857	L	F	G	0.26	6.75E-07	0.17	4.95E-07
rs6827857	C	RC	G	4.57	1.92E-02	2.98	1.30E-02
rs6833424	R	RC	G	0.2	4.90E-05	0.2	2.32E-04
rs6833424	R	RC	A	0.19	1.21E-02	0.34	9.12E-03
rs6833424	C	F	G	0.55	1.35E-02	0.33	1.41E-02
rs6834787	C	F	C	0.26	2.53E-05	0.12	4.95E-07
rs6834787	R	F	T	0.27	8.73E-05	0.16	7.86E-03
rs6834787	L	F	C	0.18	1.08E-03	0.25	1.08E-03

rs6834787	R	RC	C	4.9	2.72E-03	5.07	3.08E-04
rs6834787	R	F	C	0.3	5.57E-03	0.23	1.41E-02
rs6834787	L	F	T	0.23	1.21E-02	0.17	2.32E-04
rs6834787	R	RC	T	4.86	2.61E-02	3.05	3.26E-03
rs6835019	R	RC	G	0.24	3.60E-07	0.25	3.52E-07
rs6835019	R	RC	A	0.24	4.76E-07	0.21	3.27E-06
rs6835019	C	RC	G	0.38	7.71E-04	0.38	2.97E-02
rs6835019	C	RC	A	0.34	2.01E-03	0.55	1.41E-02
rs6837671	R	F	G	0.2	5.08E-04	0.19	1.30E-02
rs6837671	R	F	A	0.29	2.72E-03	0.2	4.78E-05
rs6844655	C	F	T	0.4	1.11E-06	0.41	1.21E-06
rs6844655	L	F	T	0.29	3.52E-04	0.35	2.50E-03
rs6844655	R	RC	C	0.31	1.24E-03	0.29	2.87E-05
rs6844655	L	RC	T	1.85	3.58E-03	2.23	2.50E-03
rs6844655	R	RC	T	0.26	5.32E-03	0.26	9.39E-03
rs6844655	C	F	C	0.54	1.92E-02	0.5	3.92E-02
rs6844655	L	F	C	0.47	1.92E-02	0.49	6.00E-03
rs6846010	L	F	G	0.24	1.08E-03	0.16	9.67E-06
rs6847567	L	RC	T	3.37	3.08E-02	2.86	4.63E-02
rs6849143	C	RC	T	0.53	2.40E-03	0.45	1.91E-04
rs6849143	C	RC	C	0.43	4.06E-02	0.36	2.50E-03
rs6849540	C	RC	G	0.44	4.41E-05	0.41	3.27E-06
rs6849540	C	RC	A	0.53	9.12E-04	0.58	3.95E-03
rs6852373	L	F	T	0.16	6.75E-07	0.1	4.95E-07
rs6852373	L	F	A	0.2	3.01E-06	0.13	4.95E-07
rs6852928	R	RC	C	0.52	2.66E-05	0.56	1.01E-03
rs6852928	R	RC	T	0.49	2.27E-03	0.44	1.39E-02
rs6853075	C	RC	A	0.75	4.68E-02	0.62	2.74E-02
rs6854285	R	F	T	0.42	3.60E-07	0.34	3.52E-07
rs6854285	R	F	C	0.46	3.01E-06	0.37	3.93E-07
rs6854285	C	F	T	0.53	2.66E-05	0.36	2.87E-05
rs6854285	C	F	C	0.44	2.66E-05	0.32	1.19E-04
rs6856528	R	F	G	0.21	3.24E-03	0.17	3.53E-03
rs6856528	R	F	T	0.18	9.12E-03	0.22	1.30E-02
rs6857969	L	RC	A	0.15	6.75E-07	0.15	7.53E-07
rs6857969	C	RC	A	0.22	4.96E-06	0.17	5.48E-06
rs6857969	C	F	A	3.88	5.08E-04	4.77	2.12E-03
rs710834	L	F	T	3.08	3.24E-03	2.36	6.00E-03
rs710834	R	F	C	2.35	1.34E-02	2.83	3.85E-03
rs71609539	C	RC	C	0.4	8.74E-06	0.31	7.53E-07
rs71609539	C	RC	G	0.64	1.42E-03	0.55	6.00E-03
rs72665823	L	F	A	4.86	3.70E-04	4.98	5.93E-03
rs72665823	L	F	G	4.49	5.08E-04	9.18	1.03E-03
rs72665823	C	F	G	6.97	1.59E-02	4.96	3.25E-02
rs72665835	R	RC	A	0.53	3.60E-07	0.58	2.87E-05
rs72665835	L	RC	A	0.15	1.74E-06	0.21	5.48E-06
rs72665835	L	RC	G	0.42	7.39E-05	0.43	1.19E-04
rs72665835	C	RC	A	0.41	5.83E-04	0.27	3.08E-04
rs72665855	C	F	T	0.24	2.78E-05	0.11	7.53E-07
rs72665855	C	F	C	0.28	2.14E-04	0.12	1.91E-06

rs72870517	C	RC	A	2.16	8.89E-06	2.12	2.13E-02
rs72882940	L	F	G	0.21	1.56E-05	0.1	1.91E-06
rs72882940	R	F	A	10.87	2.93E-03	11.49	3.11E-02
rs72882950	R	F	A	0.23	4.76E-07	0.15	3.27E-06
rs72882950	R	F	G	0.29	1.09E-06	0.25	1.21E-06
rs73841670	C	F	C	0.13	3.60E-07	0.24	1.91E-06
rs73841670	C	F	A	0.12	6.75E-07	0.25	7.53E-07
rs73841670	L	F	C	0.15	1.74E-06	0.17	1.21E-06
rs73841670	L	F	A	0.18	1.56E-05	0.11	3.27E-06
rs73841670	R	F	C	0.26	1.65E-02	0.28	1.81E-03
rs73842249	C	F	C	0.27	2.78E-05	0.25	1.21E-06
rs73842249	C	F	G	0.26	1.58E-04	0.16	4.78E-05
rs73842249	L	RC	C	1.99	1.30E-02	2.42	3.95E-03
rs7441730	R	F	A	0.52	2.00E-02	0.58	4.32E-02
rs74610824	C	RC	C	0.17	2.78E-05	0.1	3.27E-06
rs74610824	C	RC	T	0.17	8.73E-05	0.15	3.27E-06
rs74797043	R	RC	T	2	4.75E-04	3.01	1.41E-02
rs75140020	L	RC	C	0.25	8.73E-05	0.24	3.53E-03
rs75140020	L	F	C	4.14	9.14E-04	4.63	3.37E-02
rs75140020	L	RC	T	0.27	9.12E-03	0.32	3.25E-02
rs75581102	R	RC	A	0.21	1.58E-04	0.25	8.09E-05
rs75581102	C	F	T	3.98	9.69E-04	2.27	3.34E-02
rs75581102	R	F	A	2.96	2.93E-03	3.84	5.93E-03
rs76273989	R	F	C	4.3	1.23E-04	5.26	8.09E-05
rs76273989	R	RC	C	0.49	1.65E-02	0.3	1.67E-02
rs7656238	R	RC	C	0.31	1.34E-02	0.5	1.41E-02
rs7656238	R	F	T	4.42	2.04E-02	4.51	1.36E-04
rs7658455	L	RC	G	0.19	8.89E-06	0.21	9.12E-06
rs7658455	L	RC	A	0.22	4.90E-05	0.19	1.38E-03
rs7658455	L	F	A	5.6	8.73E-05	4.77	3.53E-03
rs7658455	L	F	G	4.99	4.54E-03	2.56	2.12E-03
rs7659904	R	F	C	0.32	1.74E-06	0.42	2.50E-03
rs7659904	R	F	T	0.27	4.96E-06	0.3	3.85E-03
rs7659904	C	F	T	0.32	7.39E-05	0.55	3.53E-03
rs7659904	C	RC	C	5.61	5.57E-03	5.98	9.77E-03
rs7659904	C	F	C	0.38	2.00E-02	0.44	2.13E-02
rs7660314	L	F	G	2.63	5.59E-04	2.88	1.19E-04
rs7660314	R	F	T	1.99	1.35E-02	2.2	4.78E-05
rs7660314	L	F	T	2.15	2.79E-02	2.96	5.15E-04
rs7660385	L	F	T	0.14	8.73E-05	0.14	5.45E-05
rs7660385	L	F	C	0.2	2.82E-04	0.15	5.45E-05
rs7668636	R	RC	T	0.4	2.27E-03	0.55	8.09E-05
rs7668636	R	F	C	1.62	2.56E-02	2.01	9.28E-03
rs76704358	C	F	T	0.15	4.76E-07	0.27	7.53E-07
rs76704358	C	F	C	0.19	4.96E-06	0.25	1.19E-04
rs76704358	C	RC	T	5.3	1.23E-04	3.67	1.23E-03
rs76704358	C	RC	C	3.49	5.57E-03	4.44	2.79E-02
rs7671167	C	F	C	0.25	1.56E-05	0.15	1.21E-06
rs7671167	L	F	T	5.68	2.78E-05	9.31	1.01E-04
rs7671261	R	RC	G	0.21	1.56E-05	0.08	1.91E-06

rs7671261	R	RC	A	0.24	1.23E-04	0.1	8.09E-05
rs7672716	C	F	G	0.2	3.60E-07	0.26	3.93E-07
rs7672716	C	F	A	0.16	3.60E-07	0.22	3.52E-07
rs7672716	C	RC	A	3.93	8.73E-05	3.8	3.25E-02
rs7672716	R	F	A	0.18	3.24E-03	0.33	3.53E-03
rs7672716	R	F	G	0.19	5.32E-03	0.24	3.10E-05
rs7672894	L	F	A	0.17	1.74E-06	0.22	5.48E-06
rs7672894	R	F	A	0.24	8.89E-06	0.21	4.78E-05
rs7672894	L	RC	A	4.04	2.11E-04	5.28	2.32E-04
rs7674369	L	F	A	0.25	3.60E-07	0.27	3.52E-07
rs7674369	L	F	G	0.4	3.60E-07	0.49	1.68E-05
rs7674369	C	F	G	0.27	3.60E-07	0.28	3.52E-07
rs7674369	C	F	A	0.29	4.76E-07	0.35	5.48E-06
rs7674369	R	F	A	0.28	1.09E-06	0.18	4.95E-07
rs7674369	R	RC	G	14.11	4.96E-06	10.9	1.81E-03
rs7674369	R	RC	A	8.67	1.56E-05	11.15	4.05E-04
rs7674369	R	F	G	0.27	2.53E-05	0.25	2.29E-04
rs7674369	C	RC	G	7.33	9.12E-03	4.53	2.79E-02
rs76806573	C	RC	C	5.85	1.08E-03	6.86	4.05E-04
rs76806573	C	RC	T	3.08	2.72E-03	3.72	1.67E-02
rs7680864	C	F	C	0.25	1.08E-03	0.38	2.29E-04
rs7680864	C	RC	C	2.61	8.48E-03	6.34	2.32E-04
rs7682431	L	RC	G	0.23	4.96E-06	0.16	2.32E-04
rs7682431	C	RC	G	0.21	4.90E-05	0.21	3.08E-04
rs7682431	C	RC	C	0.14	1.58E-04	0.15	1.68E-05
rs7682431	L	RC	C	0.3	2.11E-04	0.25	9.12E-06
rs7682431	R	RC	C	0.19	5.08E-04	0.22	4.05E-04
rs7682431	C	F	C	6.1	2.93E-03	7.61	3.26E-03
rs7682431	R	RC	G	0.14	5.32E-03	0.3	3.11E-02
rs7682431	R	F	G	3.75	3.00E-02	7.85	4.53E-02
rs7683339	R	RC	C	1.71	1.55E-03	1.82	7.25E-05
rs7686954	R	RC	T	0.51	3.58E-03	0.71	2.97E-02
rs7687539	R	RC	G	0.4	5.32E-03	0.42	4.32E-02
rs7687539	C	RC	G	0.35	5.32E-03	0.27	3.53E-03
rs76884708	L	RC	C	0.19	2.78E-05	0.11	5.67E-03
rs7689489	C	RC	A	0.33	3.01E-06	0.4	1.19E-04
rs7689489	R	RC	A	0.3	1.49E-05	0.48	4.78E-05
rs7689489	C	F	G	4.05	4.54E-03	3.19	3.34E-02
rs7689489	C	F	A	2.44	3.00E-02	4.44	2.03E-02
rs7690336	L	F	G	0.25	2.78E-05	0.17	7.19E-04
rs7690336	L	F	A	0.27	1.58E-04	0.18	5.48E-06
rs7690336	R	RC	G	0.42	9.12E-03	0.23	2.16E-02
rs7690336	R	RC	A	0.29	2.04E-02	0.28	6.00E-03
rs7690839	R	RC	G	0.36	5.32E-03	0.31	5.67E-03
rs7690839	R	RC	A	0.45	5.57E-03	0.43	9.39E-03
rs7695177	R	F	G	0.29	6.75E-07	0.23	1.91E-04
rs7695177	L	F	G	0.18	8.89E-06	0.22	9.12E-06
rs7695177	C	RC	G	6.3	1.08E-03	4.94	4.78E-03
rs7695177	R	RC	G	4.36	1.08E-03	4.95	2.03E-02
rs7695732	R	F	C	3.6	4.75E-04	3.87	1.55E-05

rs7695732	L	F	C	3.88	8.77E-03	3.2	9.39E-03
rs7697781	C	F	C	4.35	7.39E-05	3.65	2.76E-05
rs7697900	R	F	C	3.43	3.01E-06	4.07	2.87E-05
rs7697900	R	F	T	2.46	5.57E-03	2.37	2.87E-05
rs7697921	C	F	G	3.43	2.11E-04	2.61	2.97E-02
rs7697921	R	F	C	4.37	1.42E-03	6.11	1.36E-04
rs7697921	C	RC	C	0.38	2.27E-03	0.68	2.02E-02
rs7697921	R	F	G	2.96	2.79E-02	4.24	8.55E-04
rs7697921	C	F	C	2.18	4.46E-02	2.07	4.63E-02
rs77140172	L	RC	A	3.26	4.90E-05	3.01	1.81E-03
rs77140172	R	RC	A	1.44	1.35E-02	2.68	4.63E-02
rs78122929	R	F	G	0.51	4.41E-05	0.37	4.78E-05
rs78122929	L	F	G	0.16	4.90E-05	0.12	5.48E-06
rs78122929	L	F	A	0.24	3.24E-03	0.13	2.03E-02
rs78122929	L	RC	G	1.67	2.97E-02	2.11	4.32E-02
rs78232283	L	F	C	3.3	4.31E-02	7.13	3.26E-03
rs78517451	C	RC	A	0.21	3.01E-06	0.17	1.21E-06
rs78517451	C	RC	C	0.26	4.32E-05	0.2	8.55E-04
rs78517451	L	RC	A	0.54	2.40E-03	0.58	3.92E-02
rs78681184	L	F	T	0.29	9.69E-04	0.27	1.38E-03
rs79048757	C	RC	T	0.17	3.60E-07	0.12	3.52E-07
rs79048757	C	RC	C	0.16	4.76E-07	0.1	3.93E-07
rs79048757	L	RC	T	0.41	3.70E-04	0.46	2.29E-04
rs79048757	L	RC	C	0.51	3.58E-03	0.39	4.32E-02
rs79524934	R	F	T	0.36	4.32E-05	0.34	5.15E-04
rs79524934	C	F	C	0.28	1.08E-03	0.21	7.86E-03
rs79524934	R	RC	C	2.41	4.85E-02	2.14	2.79E-02
rs80074956	C	RC	C	0.47	5.32E-03	0.08	1.21E-06
rs80074956	C	F	A	1.48	2.00E-02	2.11	6.00E-03
rs80239864	R	F	T	0.25	1.58E-04	0.09	5.48E-06
rs80239864	R	F	C	0.31	2.72E-03	0.12	1.55E-05
rs874147	L	F	A	0.16	3.60E-07	0.19	9.77E-06
rs874147	R	F	A	0.13	8.89E-06	0.28	2.23E-03
rs874147	R	F	C	0.44	2.53E-05	0.47	4.32E-02
rs874147	L	F	C	0.27	2.11E-04	0.38	5.15E-04
rs874147	L	RC	C	3.03	9.14E-04	5.15	1.03E-03
rs9224	R	RC	A	0.61	1.34E-02	0.55	6.00E-03
rs9307053	C	RC	G	0.17	3.60E-07	0.19	3.52E-07
rs9307053	L	RC	A	0.26	3.60E-07	0.21	3.52E-07
rs9307053	C	RC	A	0.19	4.76E-07	0.16	3.93E-07
rs9307053	L	RC	G	0.23	1.09E-06	0.22	7.53E-07
rs9307053	L	F	A	4.08	1.62E-03	4.53	1.41E-02
rs9307058	L	F	G	0.14	4.96E-06	0.21	1.55E-05
rs9307058	L	F	T	0.17	2.14E-04	0.23	1.08E-03
rs9307061	C	RC	C	0.43	1.56E-05	0.41	1.91E-06
rs9307061	C	RC	T	0.57	5.57E-03	0.47	2.23E-03
rs9307061	L	RC	C	0.54	7.31E-03	0.26	1.23E-03
rs9307061	R	F	T	1.86	4.46E-02	2.17	3.85E-03
rs938268	C	F	T	0.16	6.75E-07	0.25	4.78E-05
rs938268	R	F	C	0.12	1.74E-06	0.21	4.95E-07

rs938268	R	F	T	0.14	3.01E-06	0.16	1.21E-06
rs938268	C	RC	T	3.68	8.73E-05	6.53	2.32E-04
rs938268	C	F	C	0.17	2.14E-04	0.32	3.53E-03
rs938268	L	F	C	0.24	9.14E-04	0.18	1.03E-03
rs938268	C	RC	C	4.49	1.62E-03	3.45	4.78E-03
rs938268	R	RC	C	7.95	2.93E-03	5.56	4.53E-02
rs9991039	C	RC	A	2.88	4.96E-06	4.41	2.32E-04
rs9991039	C	RC	T	4.61	1.42E-03	3.85	3.08E-04
rs9991039	R	RC	T	2.25	5.32E-03	2.86	2.13E-02
rs9991039	R	RC	A	1.88	1.34E-02	2.08	2.97E-02
rs9991328	C	RC	C	0.26	1.09E-06	0.3	2.87E-05
rs9991328	C	RC	T	0.2	1.74E-06	0.24	1.21E-06
rs9991328	L	RC	C	0.3	2.53E-05	0.13	3.27E-06
rs9991328	L	RC	T	0.2	8.77E-03	0.1	2.87E-05
rs9992522	L	RC	C	2.12	1.56E-05	2.91	3.84E-04
rs9992522	L	F	T	0.23	5.08E-04	0.19	5.67E-04
rs9992522	L	F	C	0.18	5.08E-04	0.22	1.30E-02
rs9992522	L	RC	T	2.21	8.48E-03	2.49	2.16E-02
rs9992522	C	F	T	0.62	1.92E-02	0.73	9.28E-03
rs9996559	L	RC	T	0.26	1.74E-06	0.33	1.36E-04
rs9996559	L	RC	C	0.3	7.39E-05	0.43	9.39E-03
rs9996559	L	F	T	6.26	2.11E-04	8.42	1.55E-05
rs9996559	L	F	C	4.83	2.14E-04	6.04	8.09E-05
rs9996559	C	RC	T	0.35	2.82E-04	0.42	6.00E-03
rs9996732	R	F	G	0.14	1.09E-06	0.2	1.21E-06
rs9996732	C	F	A	0.17	1.74E-06	0.22	8.09E-05
rs9996732	R	F	A	0.17	3.01E-06	0.23	1.21E-06
rs9996732	C	F	G	0.19	4.96E-06	0.23	4.78E-05
rs9996732	L	F	G	0.18	4.96E-06	0.3	2.23E-03
rs9996732	L	F	A	0.15	4.32E-05	0.28	2.29E-04
rs9996732	L	RC	A	3.48	2.01E-03	3.98	1.08E-03
rs9996732	L	RC	G	4.58	7.31E-03	5.04	1.75E-04

Table E2

SNP	minP1_effectAllele	GWAS.OR	GWAS.P.value	combo	hlest.minP1	adj.P.minP1	hlest.SV40	adj.P.SV40
rs10516821	C	0.81180103	0.001573	R:RC	1.170370301	6.61E-12	0.785186922	8.64E-05
rs10516821	C	0.81180103	0.001573	C:RC	1.459719771	2.55E-06	1.296270753	9.90E-06
rs10516826	C	0.88878493	0.007644	R:RC	0.497695057	0.003705124	0.309997547	0.219520053
rs11722033	A	1.15580839	8.94E-06	L:RC	0.559398949	0.176559727	0.836383571	0.016907981
rs12508524	A	0.89592372	0.001528	C:F	0.855015458	0.321281902	1.134355492	0.025620406
rs12645173	A	1.1322423	0.0001384	R:F	2.080266679	0.000840161	1.116373993	0.216513211
rs12647781	A	1.14774598	0.004225	L:RC	-0.63535713	0.001045374	-0.49217287	0.021785655
rs12647781	A	1.14774598	0.004225	C:RC	-0.614854176	0.002261164	-0.63358896	0.015575602
rs12647781	A	1.14774598	0.004225	R:RC	-1.053297856	0.005810209	-1.11549165	0.216513211
rs13124775	A	0.89323998	0.0104	R:F	-2.003012673	0.046846492	-3.40101386	0.826585399
rs1350506	C	1.11605484	0.0003613	L:F	0.971248144	0.046846492	0.87858503	0.295771188
rs1513819	G	0.92367038	0.02346	C:F	0.350678741	4.62E-05	0.192913036	0.38526763
rs1513819	G	0.92367038	0.02346	L:F	0.877759698	0.000155991	0.565944738	0.02398089
rs1513819	G	0.92367038	0.02346	L:RC	-4.803245406	9.97E-06	-6.34282051	0.000403975
rs1795738	C	1.17257244	5.05E-05	C:F	0.42126085	0.008719342	0.253270554	0.796756576
rs1795738	C	1.17257244	5.05E-05	L:F	0.578698138	0.020662184	0.265646821	0.859996719
rs1795739	A	1.2069542	2.47E-09	L:F	1.983969438	0.03336823	1.663712803	0.219520053
rs1795739	A	1.2069542	2.47E-09	R:F	1.642461692	0.076355286	1.906247798	0.007637633
rs1964516	C	0.81635987	1.49E-10	L:F	-0.694902565	0.004722388	-0.59385997	0.073041578
rs2013701	G	0.80211764	1.47E-12	R:F	0.890278568	0.003747719	0.474990594	0.502961169
rs2013701	G	0.80211764	1.47E-12	C:F	0.524060973	1.05E-05	0.364075899	0.000199568
rs2013701	G	0.80211764	1.47E-12	R:RC	-2.400075373	0.603611277	-4.77934688	0.002668884
rs2013701	G	0.80211764	1.47E-12	L:F	0.300599935	2.51E-08	0.3168949	5.02E-06
rs2167750	C	0.90275868	0.0009031	C:F	-2.126151906	5.06E-05	-2.69013601	0.000351591
rs2167750	C	0.90275868	0.0009031	R:RC	1.272732352	1.43E-07	0.812207812	0.009361568
rs2167750	C	0.90275868	0.0009031	C:RC	0.830370136	0.000301994	0.683357583	0.037046179
rs2167750	C	0.90275868	0.0009031	L:RC	0.529294953	0.000783796	0.555568763	0.0167115
rs2276936	A	0.90221719	0.0008256	L:RC	0.295086269	0.007497454	0.194456262	0.295771188
rs2276936	A	0.90221719	0.0008256	R:F	-4.115563475	3.07E-07	-4.21324419	4.26E-12
rs2464523	C	0.82514182	3.10E-07	C:F	0.383172318	0.046709739	0.213495697	0.633995983
rs2464523	C	0.82514182	3.10E-07	L:RC	-0.65815931	0.295546484	-1.55498745	0.026303908
rs2670623	A	0.84181079	2.85E-05	C:RC	-0.474766358	0.037142596	-0.4267374	0.232991831
rs2860468	C	1.03582685	0.4631	C:F	0.277905289	0.002552596	0.402510063	0.026548794
rs2860468	C	1.03582685	0.4631	L:F	0.343052713	4.62E-05	0.254984039	0.002850645
rs2860500	C	0.91219636	0.008172	C:RC	0.016658246	0.960549986	0.1267276	0.040301338
rs2869972	A	0.8692713	0.0002938	R:F	-0.178285525	0.083145597	-0.25446547	0.026503077
rs2869972	A	0.8692713	0.0002938	C:F	-0.385484549	7.55E-06	-0.41877389	0.001575047
rs2904163	A	1.27048663	0.001125	L:RC	-0.381826621	0.004722388	-0.70778522	3.40E-07
rs2904163	A	1.27048663	0.001125	C:RC	-0.572007772	0.022983579	-0.87425139	0.047852132
rs2904163	A	1.27048663	0.001125	R:RC	-0.196425003	0.000326891	-0.14413788	0.268889569
rs3017913	A	0.90041456	0.004163	L:RC	-0.531274694	0.003705124	-0.46185065	0.022960333
rs3017913	A	0.90041456	0.004163	C:RC	-0.427325037	2.51E-08	-0.28124772	0.002990009
rs3017913	A	0.90041456	0.004163	L:F	1.49463529	0.294561917	3.269704473	0.035190367
rs3017913	A	0.90041456	0.004163	R:RC	-0.204722261	0.176559727	-0.23976005	0.014796594
rs35019968	C	1.17844998	1.86E-05	C:F	-1.077004331	0.013156815	-0.94703259	0.232991831
rs3822073	C	1.11851286	0.0002849	R:RC	-0.605927328	1.43E-05	-0.47194535	0.108445541
rs3822073	C	1.11851286	0.0002849	L:F	2.006428955	0.013970256	2.65227226	0.000633322
rs3822073	C	1.11851286	0.0002849	L:RC	-0.346579047	0.015451602	-0.53587291	0.003437129
rs4693977	A	1.20153511	2.32E-07	R:RC	-0.413778204	0.463566686	-0.62097494	0.028763977
rs59188553	C	0.88603396	0.006016	R:RC	-0.591353252	0.046846492	-0.77787669	0.015575602
rs62306390	A	0.85129207	4.09E-05	R:F	-1.256277159	1.77E-08	-0.95304364	2.49E-06
rs62306390	A	0.85129207	4.09E-05	L:RC	6.985310824	0.017283455	4.883951042	0.073483801
rs62306390	A	0.85129207	4.09E-05	L:F	-1.314475749	0.0050965	-1.11499441	0.113995155
rs62306390	A	0.85129207	4.09E-05	C:F	-1.01910654	1.88E-07	-0.33782385	0.579429961
rs6828137	G	0.90284896	0.001295	C:F	-1.824937869	0.001066404	-0.21158087	1
rs6828137	G	0.90284896	0.001295	L:F	-2.095451914	0.00474819	-0.47161713	0.872135225

rs6857969	A	0.92737246	0.02046 L:RC	-0.936552471	1.84E-08	-0.66183981	4.30E-06
rs6857969	A	0.92737246	0.02046 C:RC	-0.90400263	0.000515496	-1.13317186	0.000297005
rs6857969	A	0.92737246	0.02046 C:F	3.074588262	6.98E-05	3.631703981	0.003049379
rs71609539	C	0.84865715	1.80E-05 L:RC	-0.556962456	0.039563499	-0.49446248	0.029588883
rs72665835	A	1.17927519	0.0003196 R:RC	-0.529363092	2.70E-07	-0.41630715	0.000199568
rs72665835	A	1.17927519	0.0003196 L:RC	-0.241077818	4.85E-05	-0.17284888	0.177369645
rs72882940	A	0.78270454	1.80E-05 L:F	0.368045585	0.000783796	-0.00590871	1
rs75581102	A	1.39849967	1.11E-06 C:F	-2.419151758	0.017790993	-0.73159991	0.843325301
rs7656238	C	1.14797555	0.0002798 R:F	-2.606197243	0.135703022	-2.35099792	0.016907981
rs7671167	C	0.80468853	3.13E-12 L:F	-4.286010199	1.77E-08	-8.16393646	3.31E-09
rs7671167	C	0.80468853	3.13E-12 L:RC	0.362346441	0.607323583	0.891265734	0.000376578
rs7671167	C	0.80468853	3.13E-12 C:F	-0.988252889	0.008963211	-0.48978071	0.040301338
rs7672894	A	1.12344516	0.0002287 C:F	-0.443120641	0.161462627	-0.73941206	0.014796594
rs7672894	A	1.12344516	0.0002287 L:RC	3.280283809	2.25E-06	4.469115034	5.02E-06
rs7672894	A	1.12344516	0.0002287 R:F	-1.414544086	1.77E-08	-1.32761712	1.17E-07
rs7672894	A	1.12344516	0.0002287 L:F	-0.60667438	1.35E-05	-0.56168741	0.004487558
rs7672894	A	1.12344516	0.0002287 R:RC	3.329417992	2.39E-06	2.320386241	0.154830687
rs7674369	A	1.26465581	1.11E-13 L:F	-0.136143851	0.024897837	-0.21504234	0.022960333
rs7682317	C	0.78820269	4.06E-14 R:F	0.39603431	0.471847158	0.681597304	0.016907981
rs7687539	A	1.20647152	9.57E-08 R:F	1.716812255	0.008941376	2.477498915	0.014796594
rs7689489	A	0.89484926	0.002013 R:RC	-0.472815639	0.001795385	-0.35449364	0.386994631
rs7689489	A	0.89484926	0.002013 C:RC	-0.830274693	2.94E-05	-0.61175692	0.02398089
rs7695177	C	0.89520727	0.0003325 C:RC	-4.580822997	0.000337758	-3.42883009	0.016907981
rs7695177	C	0.89520727	0.0003325 L:F	0.94004988	1.59E-07	1.159057845	3.79E-06
rs78232283	C	0.78004786	3.20E-05 L:F	1.747709195	0.479072677	5.548769345	0.003012024
rs78681184	C	0.73168879	8.24E-07 L:RC	-2.010809659	0.023183253	-1.34911112	0.58339966
rs78681184	C	0.73168879	8.24E-07 C:RC	-0.951685901	0.482492602	-2.20832715	0.014796594
rs874147	A	0.92839313	0.02197 R:F	-0.213930316	0.004745865	-0.11668283	0.872135225
rs9224	A	0.95992512	0.2233 R:RC	-0.878506136	0.002745845	-0.82518534	0.062306168

Table E3

SNP	MAF	Position	COPDGENE_MinCondP
rs4416442	0.4	89866713	9.13E-05
rs7674369	0.41	89872176	8.52E-05
rs7682317	0.4	89860830	8.35E-05
rs4693977	0.24	89854079	3.49E-05
rs7687539	0.24	89806784	3.24E-05
rs78681184	0.09	89906598	2.72E-05
rs62306390	0.22	90031328	1.19E-05
rs2670623	0.21	89973910	1.11E-05
rs1795739	0.4	89930313	9.46E-06
rs7671167	0.49	89883979	9.31E-06
rs1964516	0.5	89875909	8.94E-06
rs7656238	0.22	89921981	8.47E-06
rs2869972	0.22	89919413	8.14E-06
rs1795738	0.23	89930434	6.94E-06
rs2013701	0.5	89885086	6.39E-06
rs75581102	0.06	89725505	1.26E-06
rs6828137	0.46	90059434	4.55E-07
rs7672894	0.46	90077431	3.76E-07
rs11722033	0.35	89906750	3.35E-07
rs35019968	0.24	89746220	2.84E-07
rs71609539	0.24	89747394	2.76E-07
rs2464523	0.21	89860847	1.91E-07
rs7689489	0.25	89531258	1.38E-07
rs12645173	0.37	90036099	1.22E-07
rs2860500	0.29	89647070	1.20E-07
rs3017913	0.26	89603298	1.11E-07
rs12508524	0.27	89938362	1.11E-07
rs6857969	0.32	89986326	7.73E-08
rs874147	0.32	89998258	6.73E-08
rs78232283	0.05	89581654	6.30E-08
rs72882940	0.05	89543190	6.29E-08
rs1350506	0.49	89734587	6.06E-08
rs7695177	0.49	89737558	5.74E-08
rs3822073	0.49	89739624	5.74E-08
rs2276936	0.49	89726283	5.61E-08
rs2167750	0.49	89730074	4.18E-08
rs9224	0.34	89649659	3.44E-08
rs13124775	0.18	89826360	3.21E-08
rs12647781	0.08	90056378	3.07E-08

rs1513819	0.43	90080937	2.70E-08
rs10516821	0.07	89727979	1.71E-08
rs2904163	0.06	89647069	1.56E-08
rs2860468	0.09	89612668	1.23E-08
rs10516826	0.17	89918968	1.93E-09
rs59188553	0.17	89927702	1.90E-09
rs72665835	0.16	89855138	1.13E-09

Table E4

SNP Name	3C Primers Sequence
rs1795739	GGCGTCAATCTGTGAATTTTGGAC
Rs2013701/rs7671167	GGTAGACAGAATAACAACATCCCCTC
Positive Control	GAACTCTTGCCTGAGACTCACTC
Promoter	CATGGACTGAGAAGTATAATGAGCGAG