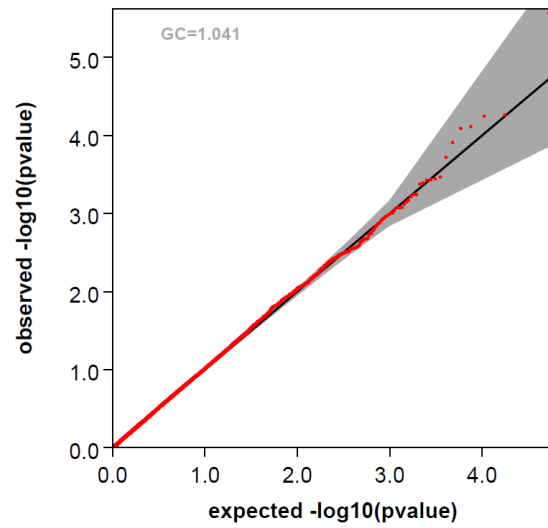


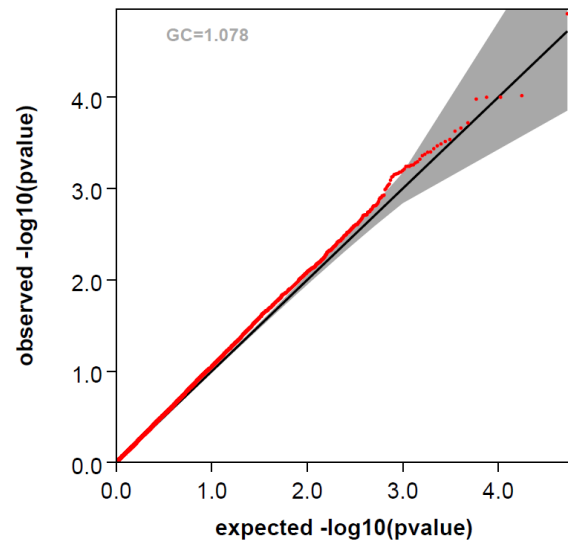
Supplemental Data

Supplementary Figure 1. QQ plot for RMR adjusted for BMI
single variant analysis (maf<0.05)

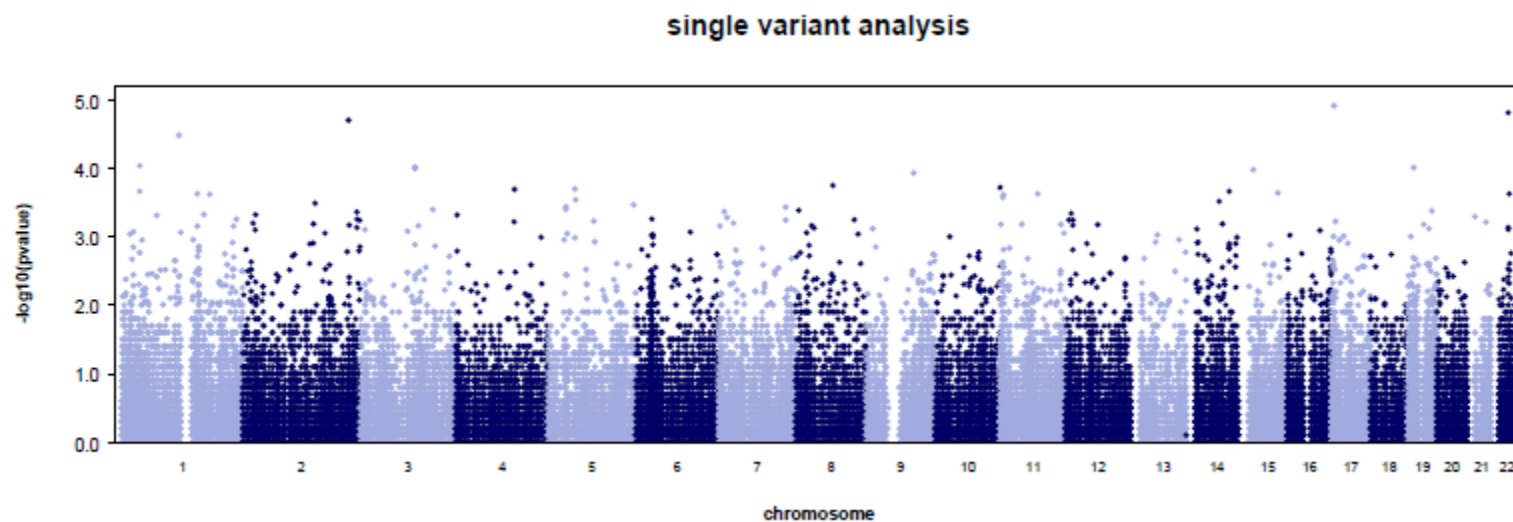


Supplementary Figure 2. QQ plot for RMR without adjustment for BMI

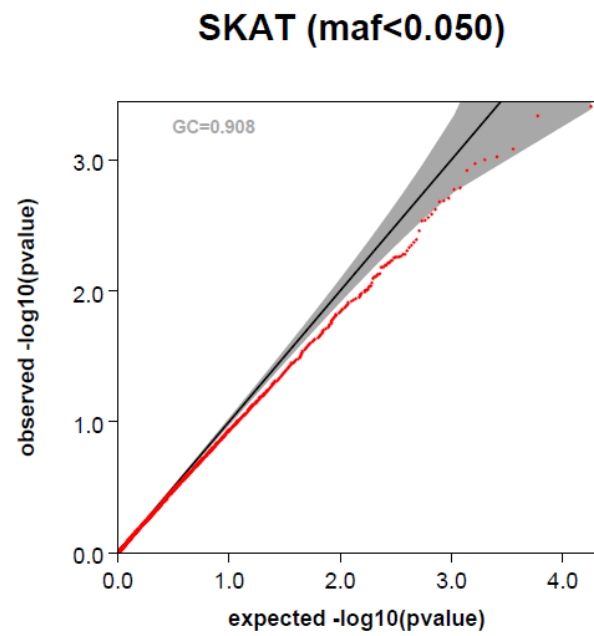
single variant analysis (maf<0.05)



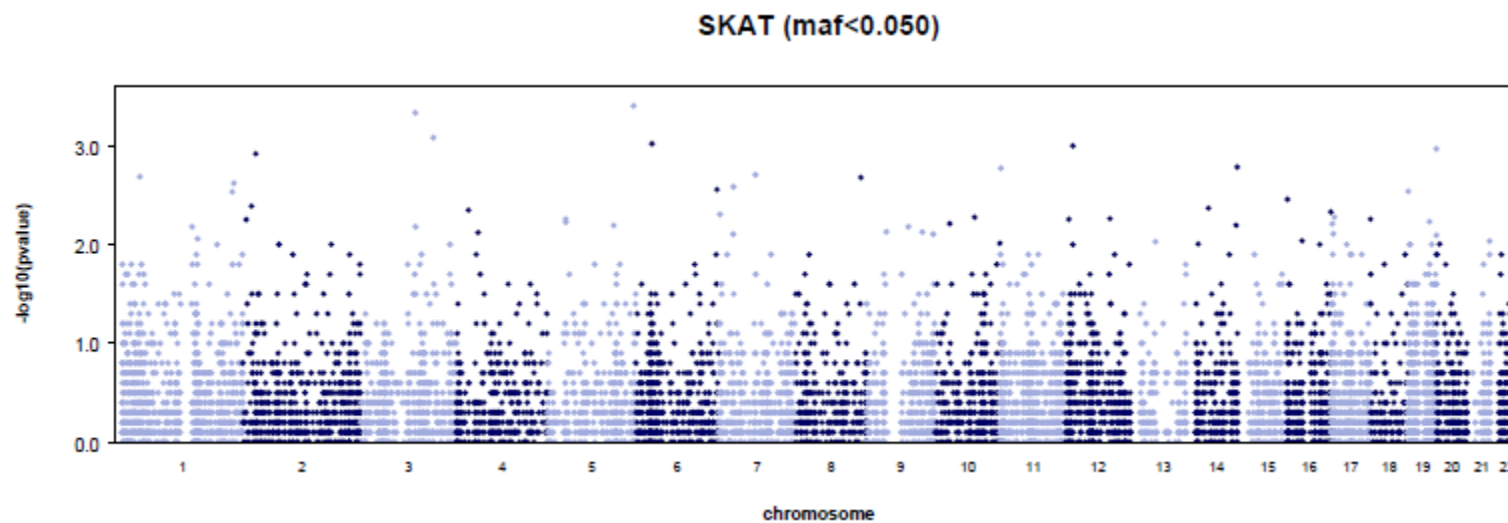
Supplementary Figure 3. Manhattan plot of RMR Association not adjusted for BMI



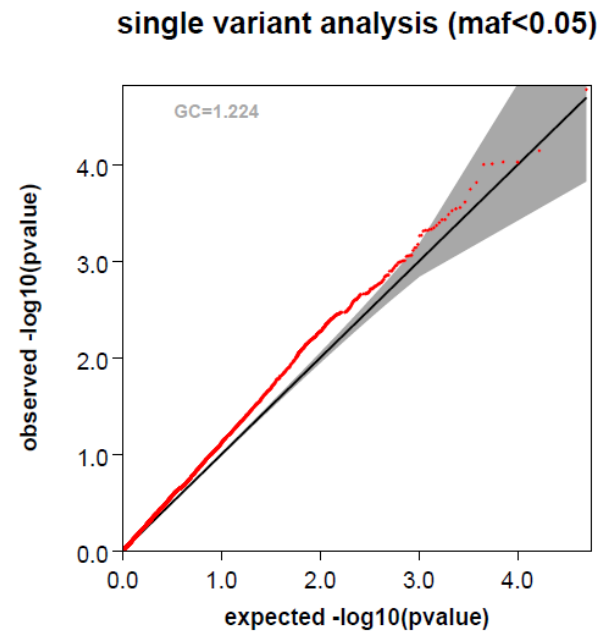
Supplementary Figure 4. QQ plot for gene-based association of RMR without adjustment for BMI



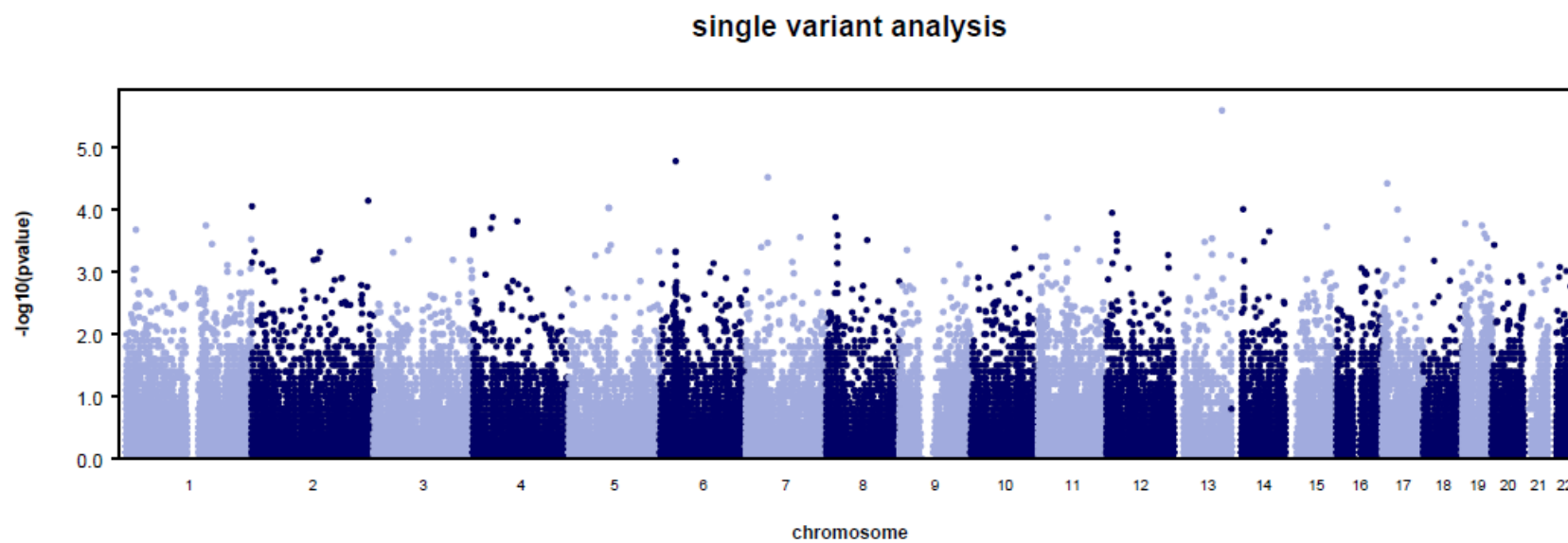
Supplementary Figure 5. Manhattan plot for gene-based association of RMR without adjustment for BMI



Supplementary Figure 6. RMR Single Variant analysis in Children (no BMI adjustment)

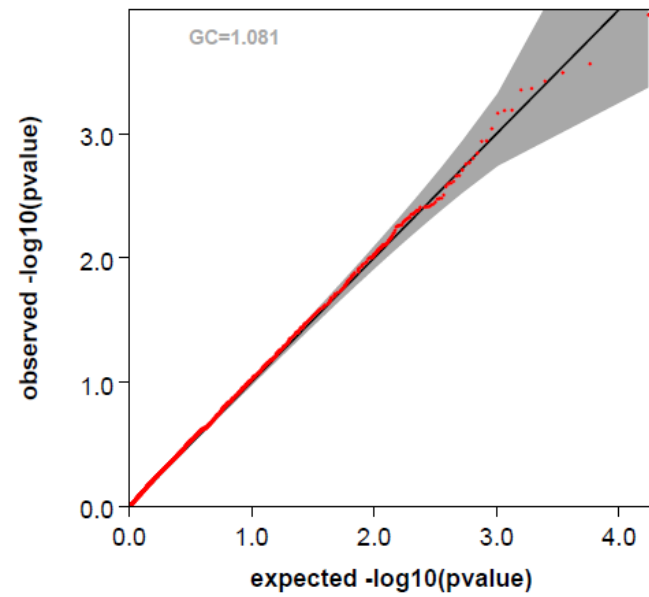


Supplementary Figure 7. RMR Single Variant Analysis in Children only (Not BMI adjusted)

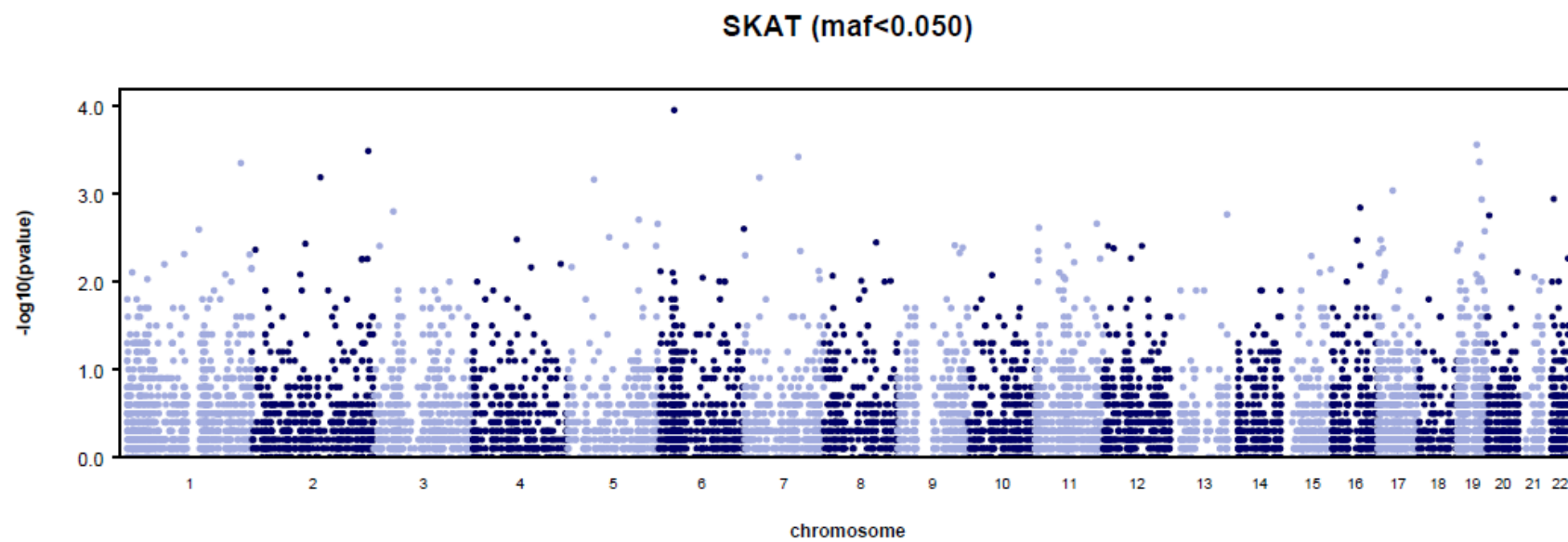


Supplementary Figure 8. SKAT analysis of RMR (not BMI adjusted) in Children only – qq plot

SKAT (maf<0.050)



Supplementary Figure 9. SKAT analysis of RMR (not BMI adjusted) in Children only



Supplementary Table 1. Correlation of measured phenotypes in adults

	Weight	Height	BMI	FatMass	BodyFat	FatFreeMass	BMD	SBP	Insulin	Cholesterol	Triglyc	HDL	LDL	REE	VO2Max	Glucose
Weight	1															
Height	0.406	1														
BMI	0.760	-0.269	1													
FatMass	0.761	0.012	0.760	1												
BodyFat	0.410	-0.278	0.591	0.863	1											
FatFreeMass	0.690	0.651	0.288	0.055	-0.332	1										
BMD	0.645	0.324	0.459	0.344	0.052	0.610	1									
SBP	0.344	0.229	0.186	0.215	0.063	0.318	0.214	1								
Insulin	0.248	-0.044	0.273	0.284	0.208	0.036	0.130	-0.046	1							
Cholesterol	0.187	-0.106	0.231	0.245	0.273	0.010	-0.009	0.160	-0.252	1						
Triglyc	0.370	0.177	0.227	0.306	0.204	0.236	0.203	0.199	-0.031	0.448	1					
HDL	-0.449	-0.231	-0.268	-0.344	-0.175	-0.268	-0.152	-0.129	-0.268	0.155	-0.399	1				
LDL	0.343	-0.048	0.338	0.368	0.337	0.071	0.000	0.183	-0.105	0.849	0.366	-0.299	1			
RMR	0.319	0.258	0.198	-0.069	-0.282	0.559	0.381	0.289	-0.133	0.025	0.068	-0.030	0.012	1		
VO2Max	0.262	0.541	-0.071	-0.257	-0.597	0.626	0.258	0.152	-0.223	0.000	0.188	-0.136	0.029	0.368	1	
Glucose	0.598	0.260	0.620	0.667	0.623	0.332	0.421	0.332	-0.120	0.665	0.366	-0.180	0.594	0.267	0.200	1

Correlations greater than |0.5| are in bold, with correlations greater than |0.7| also shaded in gray.

Supplementary Table 2. Correlation of measured phenotypes in children

	Weight	Height	BMI	FatMass	BodyFat	FatFreeMass	BMD	SBP	Insulin	Cholesterol	Triglyc	HDL	LDL	REE	VO2Max	Glucose
Weight	1															
Height	0.633	1														
BMI	0.901	0.249	1													
FatMass	0.840	0.202	0.938	1												
BodyFat	0.548	-0.094	0.750	0.887	1											
FatFreeMass	0.802	0.860	0.525	0.350	-0.031	1										
BMD	0.706	0.651	0.533	0.399	0.137	0.778	1									
SBP	0.572	0.418	0.485	0.406	0.189	0.543	0.408	1								
Insulin	-0.097	-0.165	-0.025	-0.049	-0.016	-0.105	-0.068	0.024	1							
Cholesterol	-0.126	-0.093	-0.122	-0.093	-0.062	-0.171	-0.129	0.006	-0.107	1						
Triglyc	0.141	-0.055	0.203	0.226	0.240	-0.005	-0.092	0.208	-0.106	0.236	1					
HDL	-0.396	-0.104	-0.435	-0.411	-0.352	-0.235	-0.090	-0.260	0.106	0.295	-0.314	1				
LDL	0.014	-0.041	0.022	0.037	0.037	-0.074	-0.092	0.056	-0.096	0.893	0.125	-0.065	1			
RMR	0.702	0.539	0.573	0.538	0.287	0.620	0.416	0.394	-0.195	-0.016	0.094	-0.241	0.086	1		
VO2Max	0.429	0.648	0.183	-0.002	-0.263	0.710	0.481	0.314	-0.005	-0.083	-0.019	-0.097	-0.033	0.444	1	
Glucose	0.208	-0.048	0.272	0.279	0.193	0.056	0.167	0.273	0.214	0.057	0.191	-0.082	0.024	0.105	-0.067	1

Correlations greater than |0.5| are in bold, with correlations greater than |0.7| also shaded in gray.

Supplementary Table 2. Results from GWAS Catalog obesity-related genes with RMR

CHR	SNP	Annotation	P-value ^a	Beta ^a	Beta SE ^a	P-value ^b	Beta ^b	Beta SE ^b
22	rs3827354	PLA2G6:intron	0.0002	3.93E-05	1.07E-05	0.0018	3.21E-05	1.03E-05
13	rs2352028	GPC5:intron	0.0032	3.48E-05	1.18E-05	0.089	1.94E-05	1.14E-05
1	rs1409157	TBX15:intron	0.0037	-3.21E-05	1.11E-05	0.0079	-2.84E-05	1.07E-05
1	rs10493485	NEGR1:intron	0.0039	4.03E-05	1.39E-05	0.0052	3.61E-05	1.29E-05
14	rs368692	NRXN3:intron	0.0044	-3.18E-05	1.12E-05	0.0015	-3.37E-05	1.06E-05
22	rs5756931	PLA2G6:intron	0.0048	-3.37E-05	1.20E-05	0.0211	-2.58E-05	1.12E-05
14	rs10146997	NRXN3:intron	0.0050	-3.31E-05	1.18E-05	0.0039	-3.17E-05	1.10E-05
15	rs17747633	CASC5:K1259E	0.0062	-3.75E-05	1.37E-05	0.091	-2.23E-05	1.32E-05
10	rs77961654	TCF7L2:P477T	0.0064	-1.18E-04	4.33E-05	0.028	-8.41E-05	3.84E-05
3	rs1801282	PPARG:P12A	0.0065	5.43E-05	1.99E-05	0.060	3.44E-05	1.83E-05
2	rs1013940	SLC5A7:I89V	0.0065	5.98E-05	2.20E-05	0.0024	6.20E-05	2.04E-05
16	rs117587884	NLRC5:D1257N	0.0072	1.05E-04	3.90E-05	0.0099	9.52E-05	3.69E-05
1	rs984222	TBX15:intron	0.0080	-3.07E-05	1.16E-05	0.017	-2.42E-05	1.02E-05

^aModel 1 adjusted for age, gender, and principal components. ^bModel 2 additionally adjusted for BMI

Supplementary Table 3. Top Results from single variant association of RMR (not adjusted for BMI) in Children Only

SNP	CHR	POS	Alleles	N	MAF	Beta	Beta SE	PVALUE
rs9561921	13	96293631	G/A	111	0.09	0.000125	2.66E-05	2.52E-06
rs116607188	6	31496949	C/T	111	0.02	-0.00024	5.69E-05	1.65E-05
rs3214631	7	43495878	T/-	111	0.50	6.28E-05	1.50E-05	2.99E-05
rs9908677	17	9712255	A/G	111	0.49	6.11E-05	1.48E-05	3.75E-05
rs148296188	2	232156084	C/T	111	0.01	-0.00031	7.80E-05	7.13E-05
rs13023962	2	1271230	A/G	111	0.35	-6.03E-05	1.54E-05	8.74E-05
rs192180434	5	79032067	G/T	111	0.01	-0.00027	7.02E-05	9.31E-05
rs142926727	5	79035144	C/A	111	0.01	-0.00027	7.02E-05	9.31E-05
rs8016634	14	23282152	G/A	110	0.04	-0.00017	4.26E-05	9.75E-05
rs79573699	17	30348206	C/T	111	0.02	-0.00019	4.98E-05	9.86E-05