Common Variants on 8p12 and 1q24.2 Confer Risk of Schizophrenia

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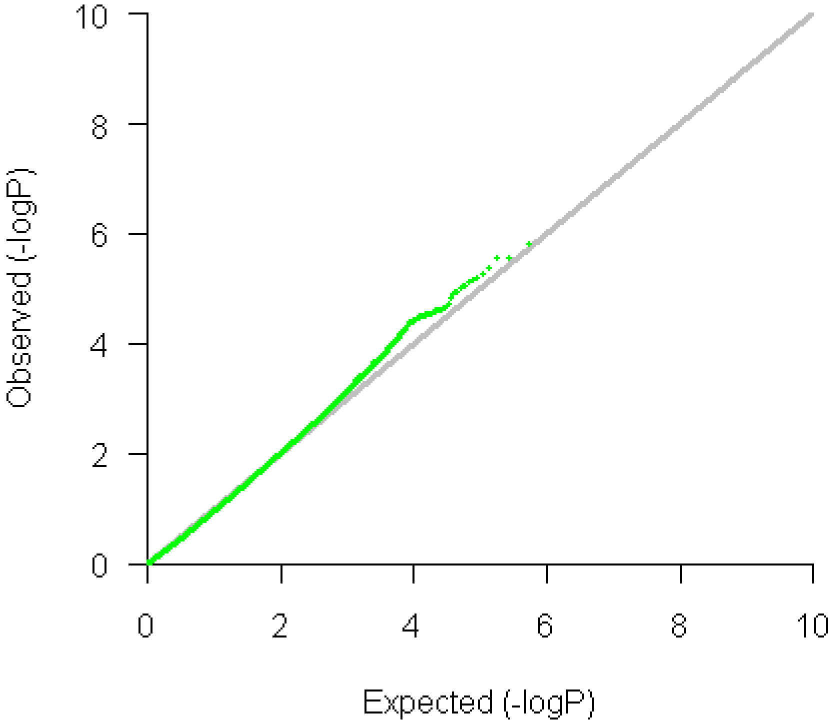
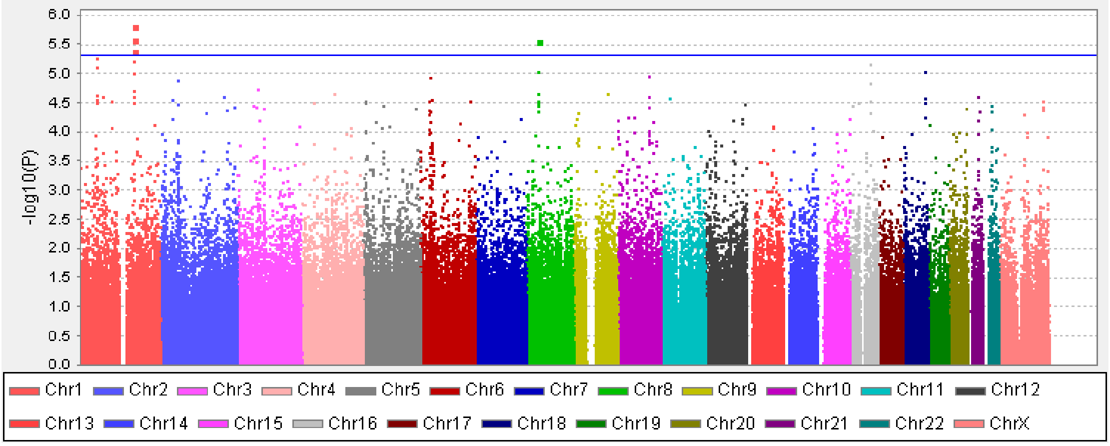
Supplementary Information

Supplementary Figure 1. Quantile-quantile Plots of BIOX GWAS datasets combined result.

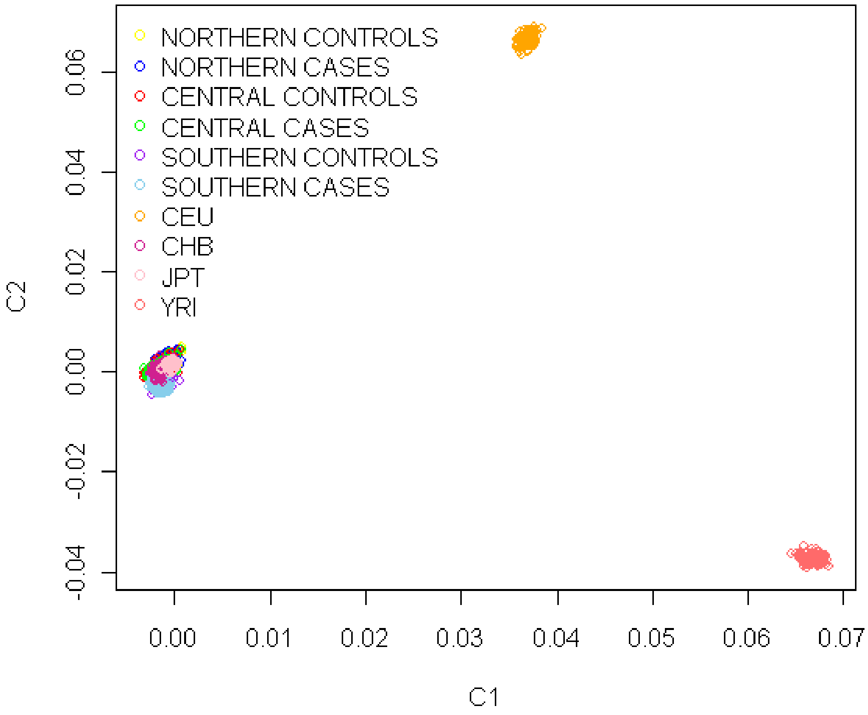


Supplementary Figure 2. Manhattan plot of the BIOX GWAS.



Note: Manhattan plot of the meta-analysis result in the discovery stage

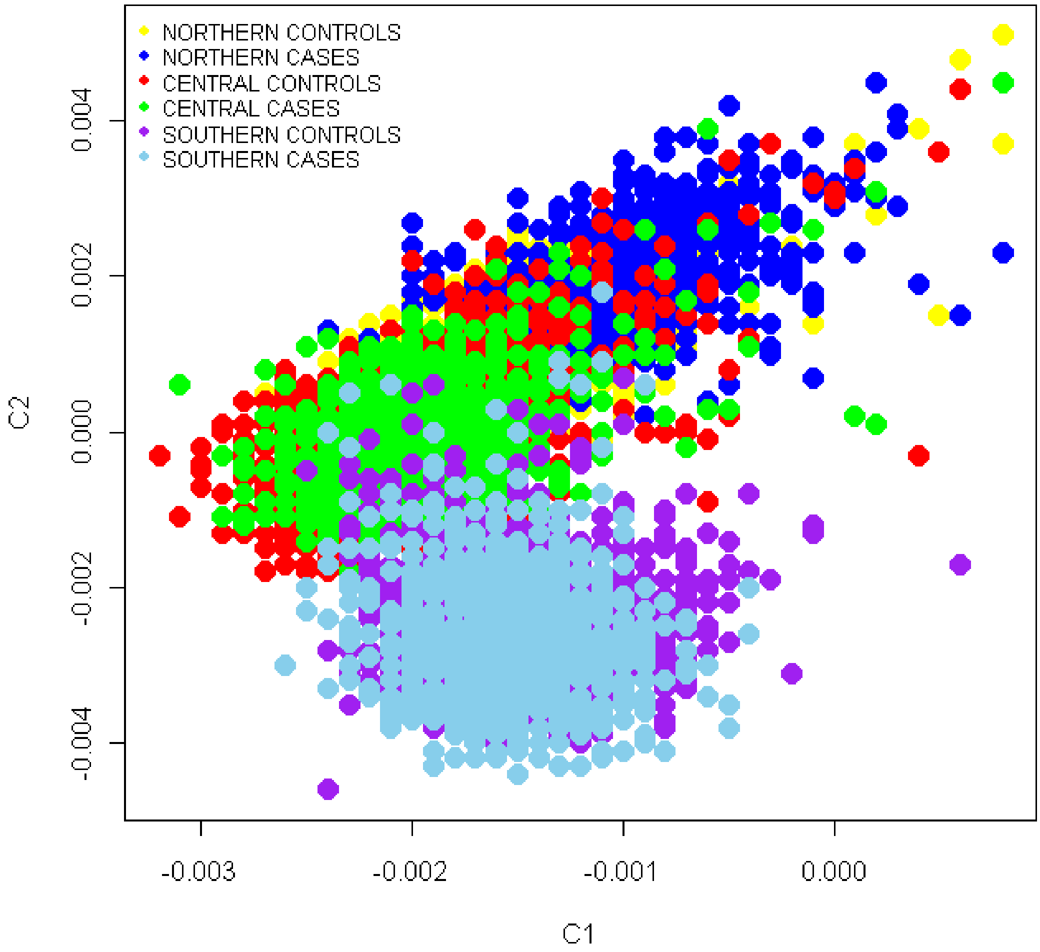
Supplementary Figure 3. The principal components analysis (PCA) of the Chinese Northern, Central, and Southern samples and HapMap individuals (CEU, CHB, JPT and YRI).



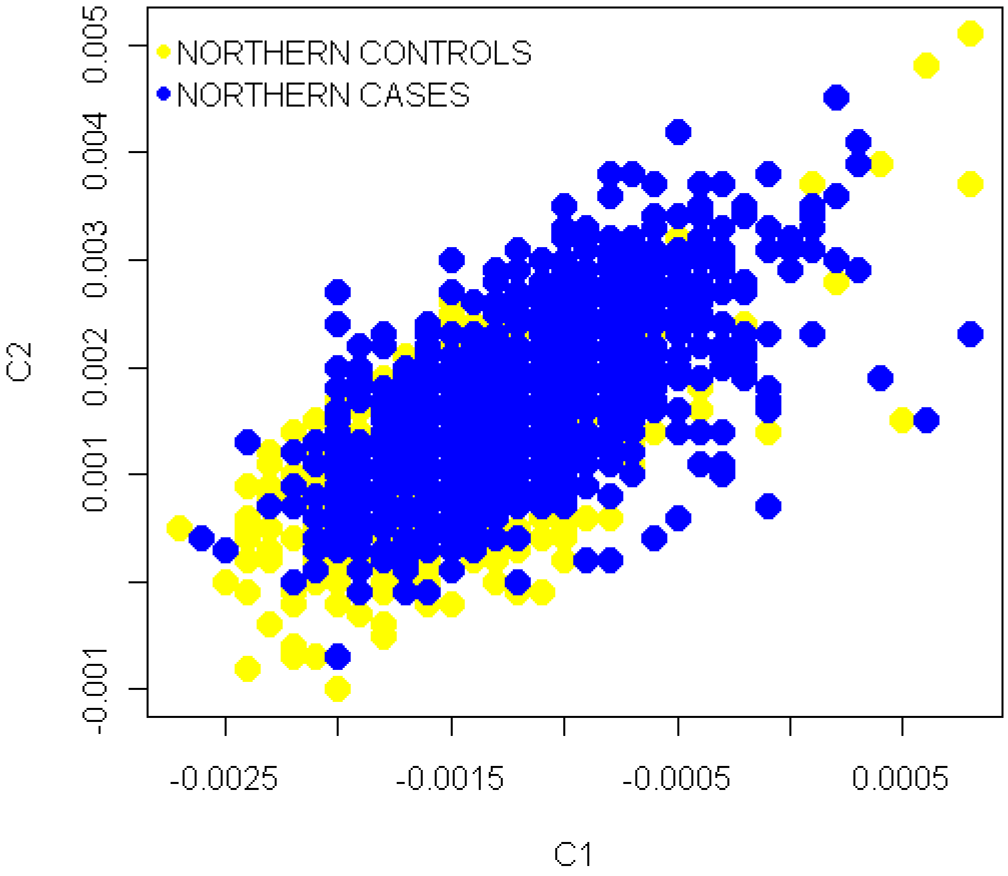
Note: Samples from different geographical origin were marked by different colors

Supplementary Figure 4. The principal components analysis (PCA) of the Chinese Northern, Central, and Southern samples (a, combined and b, c, & d separate plots).

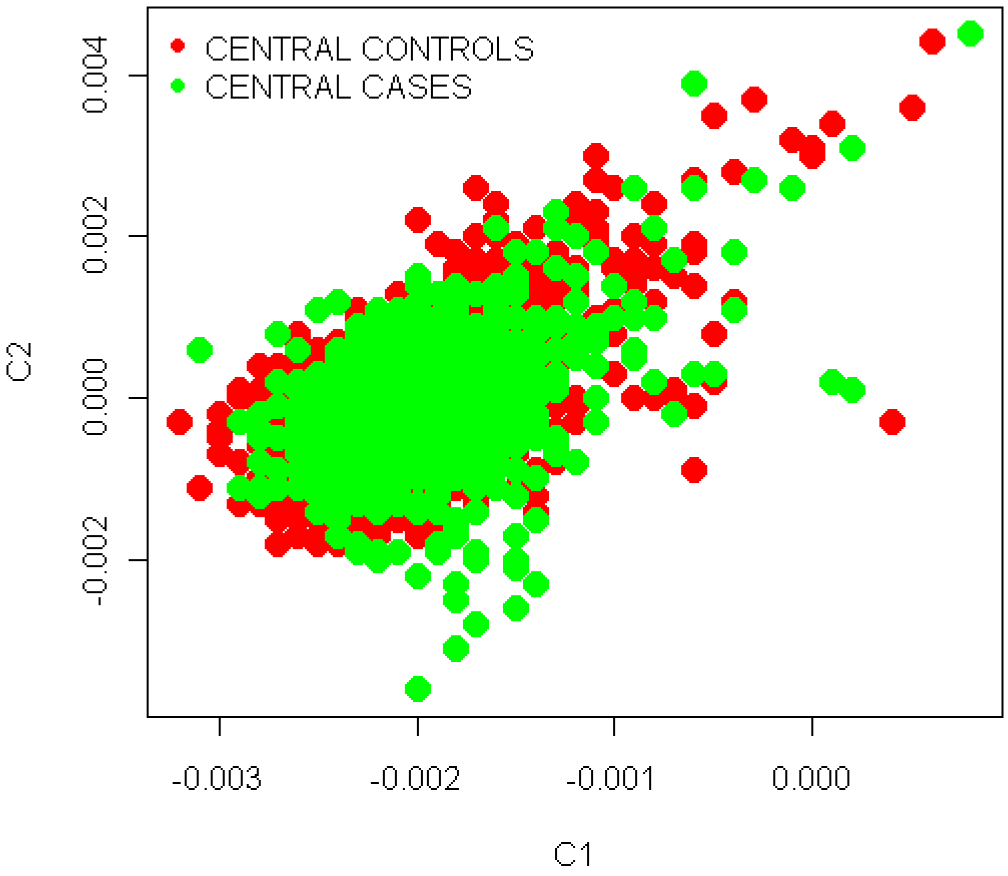
a. Combined results



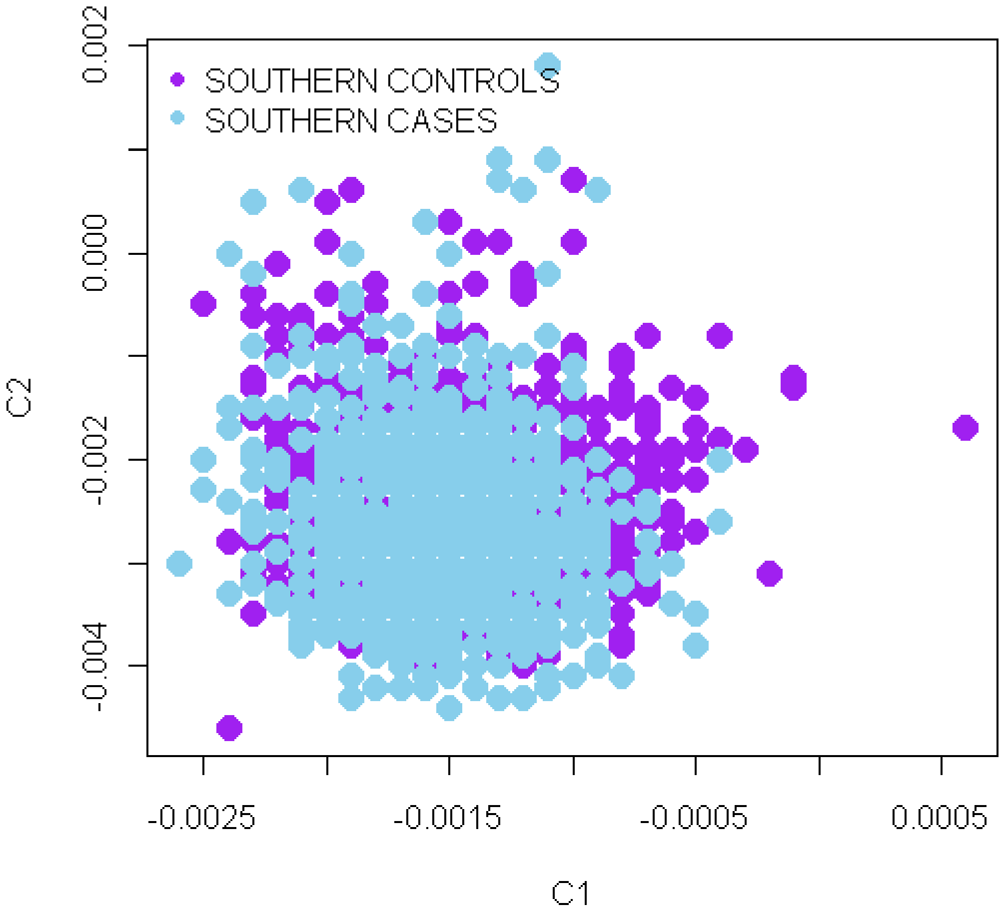
b. Results of the Northern Han samples



c. Results of the Central Han samples



d. Results of the Southern Han samples



Supplementary Table 1. Descriptive statistics of our samples.

	Bio-X GWAS						REPLICATION	
	NORTHERN HAN		CENTRAL HAN		SOUTHERN HAN			
	cases	controls	cases	controls	cases	controls	cases	controls
n	1578	1592	1238	2856	934	2020	4383	4539
% Female	30.2	49.7	44.1	64.5	41.6	52.3	43.4	65.3
Age (years)	36.9±9.3	30.8±11.1	36.2±12.4	60.9±12.2	36.3±16.6	56.1±13.5	35.6±13.3	60.7±11.2
Clinics (# of inpatient facilities/beds)	PUSH (200)	-	SIMH (1878) FPHW (210)	-	LMHG (600)	-	SIMH (1878)	-

PUSH, Peking University Sixth Hospital; SIMH, Shanghai Institute of Mental Health; FPHW, Fourth People’s Hospital, Wuhu; LMHG, Longquan Mountain Hospital of Guangxi Province.

Supplementary Table 2. Meta-analysis for the selected SNPs.

CHR	BP	SNP	A1	GROUP	P	P(R)	OR	OR(R)	Q	I^2
1	166169703	rs10489202	A	BIOX GWAS	2.65E-06	2.65E-06	1.27	1.27	0.74	0.00
				BIOX GWAS+FOLLOW-UP	9.50E-09	9.50E-09	1.23	1.23	0.71	0.00
				BIOX+SGENE-plus	1.61E-05	5.46E-03	1.12	1.17	0.00	74.63
1	166240600	rs1060041	T	BIOX GWAS	4.11E-06	4.11E-06	1.26	1.26	0.52	0.00
				BIOX GWAS+FOLLOW-UP	5.31E-07	1.79E-04	1.17	1.19	0.16	42.53
				BIOX+SGENE-plus	-	-	-	-	-	-
1	166357655	rs11586522	T	BIOX GWAS	1.53E-06	1.53E-06	1.25	1.25	0.82	0.00
				BIOX GWAS+FOLLOW-UP	1.17E-04	9.78E-03	1.13	1.17	0.02	68.58
				BIOX+SGENE-plus	-	-	-	-	-	-

8	38150502	rs16887244	G	BIOX GWAS	9.27E-06	9.27E-06	0.84	0.84	0.71	0.00
				BIOX GWAS+FOLLOW-UP	1.27E-10	1.27E-10	0.84	0.84	0.87	0.00
				BIOX+SGENE-plus	8.14E-11	8.14E-11	0.86	0.86	0.41	0.00
8	38252950	rs1488935	T	BIOX GWAS	2.81E-06	2.81E-06	0.83	0.83	0.65	0.00
				BIOX GWAS+FOLLOW-UP	5.06E-09	5.06E-09	0.85	0.85	0.64	0.00
				BIOX+SGENE-plus	1.09E-09	1.20E-08	0.88	0.87	0.34	11.19

Note: 3,750 cases and 6,468 controls were used in BIOX GWAS, including the Northern Han sample set of 1,578 cases and 1,592 controls; the Central Han sample set of 1,238 cases and 2,856 controls; and the Southern Han sample set of 934 cases and 2,020 controls. 4,383 cases, and 4,539 controls were used in FOLLOW-UP. And the SGENE-plus project includes 3,830 cases and 14,724 controls of European ancestry.

P, Fixed-effects meta-analysis p-value; P(R), Random-effects meta-analysis p-value; OR, Fixed-effects OR estimate; OR(R), Random-effects OR estimate; Q, p-value for Cochrane's Q statistic; I^2**,** I2 heterogeneity index (0-100).

Supplementary Table 3. Comparison of BIOX top findings between two datasets.

		European Population					**Asian Population**				
SNP	**Allele**[a]	**MAF (HapMap-CEU)**	**SGENE-plus dataset (3,830 cases vs 14,724 controls)**				**MAF (HapMap-HCB)**	**BIOX dataset (8,133 cases vs 11,061 controls)**			
			MAF[b]	**OR**	**P**	**95% CI**		**MAF**[c]	**OR**	**P**	**95% CI**
rs10489202	A	0.243	0.221	1.01	8.31E-01	0.94~1.09	0.163	0.141	1.23	9.50E-09	1.15~1.32
rs16887244	G	0.288	0.227	0.92	2.63E-02	0.85~0.99	0.349	0.317	0.84	1.27E-10	0.79~0.88
rs1488935	T	0.265	0.216	0.92	2.66E-02	0.85~0.99	0.349	0.316	0.85	5.06E-09	0.81~0.90

[a]Mnor allele; [b]Frequency is the average minor allelic frequency of controls in SGENE-plus dataset; [c]Frequency is the average minor allelic frequency of controls in BIOX dataset.

Supplementary Table 4. Statistical Power analysis for BIOX and SGENE-plus datasets.

Risk Allele Frequency→		**0.05**	**0.15**	**0.30**	**0.45**	**0.60**	**0.75**	**0.90**
RR↓		**BIOX DATASET (8,133 cases and 11,061 controls, 19,194 in total)**						
	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.10	0.00	***0.02***	***0.13***	***0.21***	***0.18***	***0.07***	0.00
	1.15	***0.01***	***0.33***	***0.82***	***0.91***	***0.88***	***0.63***	0.07
	1.20	***0.08***	***0.87***	***1.00***	***1.00***	***1.00***	***0.98***	0.37
	1.25	***0.34***	***1.00***	1.00	1.00	1.00	***1.00***	0.77
RR↓		**SGENE-plus DATASET (3,830 cases and 14,724 controls, 18,554 in total)**						
	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.10	0.00	0.00	0.03	0.05	0.04	0.01	0.00
	1.15	0.00	0.09	0.40	0.54	0.47	0.22	0.01
	1.20	0.02	0.50	0.92	0.96	0.94	0.72	0.09
	1.25	0.10	0.90	1.00	1.00	1.00	0.97	0.31

The power was computed based on the sample size of the BIOX and SGENE-plus datasets at significance level alpha = 5E-8. A larger statistical power compared with another dataset is demonstrated in Bold and Italic mode.

Supplementary Table 5. Regression analysis to test for independent association.

CHR	Test SNP	BP	Test SNP P[a]	Conditioned on	NORTHERN HAN		CENTRAL HAN		SOUTHERN HAN	
					Test SNP P	Conditioned SNP P	Test SNP P	Conditioned SNP P	Test SNP P	Conditioned SNP P
1	rs2071922	166092230	4.32E-02	**rs10489202**	6.35E-02	4.04E-01	2.62E-01	9.16E-01	6.79E-01	9.41E-01
1	rs6427113	166112411	3.09E-05		3.04E-03	3.12E-01	4.82E-03	9.71E-01	2.24E-01	7.64E-01
1	rs203782	166149010	9.26E-04		2.78E-02	5.93E-01	1.43E-02	4.52E-01	3.75E-01	6.06E-01
1	**rs10489202**	**166169703**	**2.65E-06**		**3.28E-03**	**NA**	**6.19E-04**	**NA**	**1.28E-01**	**NA**
1	rs1060041	166240600	4.11E-06		3.30E-03	NA	4.06E-04	NA	2.45E-01	NA
1	rs413168	166272413	1.43E-03		3.79E-02	4.55E-01	9.98E-03	6.35E-01	5.36E-01	3.72E-01
1	rs17485889	166285464	2.53E-05		1.10E-02	2.95E-01	7.70E-04	8.72E-01	2.67E-01	5.70E-01
1	rs275137	166317890	6.50E-04		1.99E-02	8.22E-01	2.80E-02	6.48E-01	2.05E-01	8.27E-01
1	rs16828104	166357523	9.90E-03		4.41E-01	8.20E-01	7.09E-03	3.32E-02	4.13E-01	6.31E-01
1	rs11586522	166357655	1.53E-06		1.37E-03	1.33E-01	9.77E-04	3.59E-01	1.23E-01	6.64E-01
1	rs11805261	166361885	3.52E-02		3.68E-01	7.05E-01	3.42E-02	9.53E-02	6.42E-01	7.83E-01
8	rs2275957	38115484	2.10E-02	**rs16887244**	6.41E-01	9.84E-01	7.53E-03	6.56E-02	3.42E-01	5.23E-01
8	rs2843738	38148865	7.14E-03		9.42E-02	6.25E-01	3.60E-02	7.58E-01	4.61E-01	9.50E-01
8	**rs16887244**	**38150502**	**9.27E-06**		**1.72E-02**	**NA**	**5.16E-04**	**NA**	**1.01E-01**	**NA**
8	rs2898674	38229372	2.99E-05		1.80E-02	6.27E-01	1.13E-03	4.13E-01	1.54E-01	3.74E-01
8	rs1488935	38252950	2.81E-06		1.13E-02	5.43E-01	2.30E-04	7.93E-01	8.87E-02	9.64E-01
8	rs11985168	38279200	6.86E-05		2.72E-02	6.70E-01	2.14E-03	1.99E-01	1.52E-01	8.51E-01

Associated SNPs on chromosome 1q24.2 and 8p12 were tested for their independent effect using logistic regression analysis. Results shown here are from the each dataset (the Northern Han sample set of 1,578 cases and 1,592 controls; the Central Han sample set of 1,238 cases and 2,856 controls; and the Southern Han sample set of 934 cases and 2,020 controls). The allelic dosage of conditioned SNPs was entered as a covariate in the regression model. [a]These P values were combined results of the PCA-adjusted genome-wide associations of three cohorts.

Supplementary Table 6. Expression quantitative trait loci (eQTL) analysis of rs10489202 and rs16887244 for lymphoblastic cell lines of HAPMAP samples.

SNP	Gene	Probe	HAPMAP			CHB+JPT			CEU			YRI		
			BETA	STAT	P	BETA	STAT	P	BETA	STAT	P	BETA	STAT	P
rs10489202	**MPZL1**	GI_21359956-S	-5.04E-02	-1.505	1.34E-01	4.30E-02	0.905	3.68E-01	-1.52E-01	-2.936	**4.79E-03**	3.29E-02	0.202	8.41E-01
	ADCY10	GI_21614540-S	8.54E-03	0.894	3.72E-01	1.14E-02	0.978	3.31E-01	1.50E-03	0.110	9.13E-01	-9.71E-03	-0.210	8.34E-01
	BRP44	GI_7661601-S	-2.06E-02	-0.540	5.90E-01	5.23E-02	1.018	3.12E-01	-9.64E-02	-1.370	1.76E-01	-1.24E-01	-0.706	4.83E-01
	DCAF6	GI_8923955-S	1.17E-01	3.706	**2.71E-04**	1.24E-01	2.615	**1.05E-02**	2.64E-02	0.488	6.27E-01	1.04E-01	0.947	3.48E-01
	GPR161	GI_24476015-I	-1.18E-02	-1.320	1.88E-01	-2.77E-02	-1.947	5.47E-02	-1.16E-03	-0.087	9.31E-01	-2.21E-02	-0.474	6.37E-01
	TIPRL	GI_33239373-S	5.59E-02	0.905	3.67E-01	-1.91E-01	-3.036	**3.16E-03**	-4.11E-02	-0.501	6.19E-01	-2.05E-01	-0.653	5.16E-01
rs16887244	**ASH2L**	GI_4757789-S	6.15E-02	2.215	**2.79E-02**	7.13E-02	1.842	6.88E-02	6.51E-02	1.153	2.54E-01	-4.68E-02	-0.868	3.89E-01
	STAR	GI_4507250-S	3.14E-02	1.182	2.39E-01	1.17E-02	0.327	7.44E-01	2.10E-02	0.403	6.89E-01	1.51E-02	0.350	7.27E-01
	LSM1	GI_7657312-S	-4.07E-02	-1.436	1.52E-01	-9.49E-02	-2.240	**2.76E-02**	-4.96E-03	-0.101	9.20E-01	-6.19E-02	-0.922	3.61E-01
	BAG4	GI_14574569-S	5.67E-02	2.895	**4.20E-03**	-1.18E-02	-0.414	6.80E-01	6.60E-02	1.986	5.18E-02	7.63E-02	1.576	1.20E-01
	DDHD2	GI_37556116-S	8.74E-02	3.695	**2.82E-04**	4.90E-02	1.479	1.43E-01	9.89E-02	1.924	5.93E-02	3.66E-02	0.800	4.27E-01
	PPAPDC1B	GI_40316920-S	8.94E-02	3.050	**2.59E-03**	4.43E-02	1.135	2.60E-01	1.30E-01	2.246	**2.85E-02**	1.24E-01	1.434	1.57E-01
	WHSC1L1	GI_13699810-I	-1.13E-02	-0.821	4.13E-01	-3.30E-02	-1.599	1.14E-01	7.34E-03	0.333	7.40E-01	1.88E-02	0.503	6.17E-01
	LETM2	GI_21389522-S	4.31E-03	0.435	6.64E-01	1.37E-03	0.115	9.09E-01	2.19E-02	1.642	1.06E-01	5.51E-02	1.847	6.98E-02
	FGFR1	GI_13186246-A	-1.03E-02	-0.779	4.37E-01	-2.44E-03	-0.173	8.63E-01	2.24E-02	0.724	4.72E-01	-2.82E-02	-0.932	3.55E-01

BETA, Regression coefficient; STAT, Coefficient t-statistic; P, Asymptotic p-value for t-statistic.

Supplementary Table 7. Expression quantitative trait loci (eQTL) analysis of rs10489202 and rs16887244 for brain.

SNP	Gene	Probe	Temporal Cortex			PONS			Frontal Cortex			Cerebellum		
			BETA	STAT	P	BETA	STAT	P	BETA	STAT	P	BETA	STAT	P
rs10489202	**MPZL1**	ILMN_1739103	-5.09E-03	-0.828	4.09E-01	5.17E-03	0.825	4.11E-01	8.06E-04	0.124	9.02E-01	6.47E-03	0.817	4.15E-01
	ADCY10	ILMN_1808797	-8.73E-03	-0.645	5.20E-01	-5.22E-03	-0.290	7.73E-01	1.48E-04	0.010	9.92E-01	-1.62E-03	-0.086	9.31E-01
	BRP44	ILMN_1727813	-2.62E-02	-1.638	1.04E-01	-2.34E-02	-1.785	7.64E-02	-3.85E-03	-0.219	8.27E-01	-1.29E-02	-0.749	4.55E-01
	DCAF6	ILMN_1670000	-7.41E-04	-0.028	9.78E-01	1.03E-02	0.328	7.44E-01	1.77E-02	0.673	5.02E-01	-1.88E-03	-0.095	9.24E-01
	GPR161	ILMN_1658586	6.17E-03	1.146	2.54E-01	1.13E-02	1.729	8.59E-02	7.66E-03	1.075	2.84E-01	-2.47E-03	-0.276	7.83E-01
	TIPRL	ILMN_1781457	-1.68E-02	-0.834	4.06E-01	-1.64E-02	-0.876	3.83E-01	-3.05E-02	-1.366	1.74E-01	-9.88E-03	-0.420	6.75E-01
rs16887244	**ASH2L**	ILMN_1666933	3.54E-02	2.453	**1.54E-02**	2.08E-02	1.473	1.43E-01	2.68E-02	1.933	5.53E-02	2.34E-02	1.734	8.51E-02
	STAR	ILMN_1701895	5.65E-03	0.963	3.37E-01	1.17E-02	1.907	5.85E-02	6.65E-03	1.189	2.37E-01	3.14E-03	0.416	6.78E-01
	LSM1	ILMN_1738956	1.19E-02	1.073	2.85E-01	1.88E-02	1.650	1.01E-01	-2.48E-03	-0.231	8.18E-01	1.51E-02	1.221	2.24E-01
	BAG4	ILMN_1727996	-4.29E-02	-1.677	9.58E-02	-8.99E-03	-0.363	7.17E-01	-7.58E-03	-0.259	7.96E-01	-3.24E-02	-1.082	2.81E-01
	DDHD2	ILMN_1705871	1.64E-02	1.625	1.06E-01	-1.68E-02	-1.277	2.04E-01	5.95E-03	0.670	5.04E-01	8.63E-03	0.774	4.40E-01
	PPAPDC1B	ILMN_1675406	9.88E-03	1.297	1.97E-01	1.08E-02	1.317	1.90E-01	8.79E-03	0.994	3.22E-01	3.17E-02	2.478	**1.44E-02**
	WHSC1L1	ILMN_1666715	8.14E-03	1.404	1.63E-01	1.74E-02	2.330	**2.13E-02**	7.98E-03	1.185	2.38E-01	7.76E-03	0.826	4.10E-01
	LETM2	ILMN_1714223	5.81E-03	0.861	3.91E-01	1.66E-02	1.958	5.22E-02	1.68E-02	2.143	**3.38E-02**	1.16E-02	1.404	1.63E-01
	FGFR1	ILMN_1729369	-2.09E-03	-0.406	6.85E-01	1.44E-02	1.496	1.37E-01	7.78E-03	0.923	3.57E-01	3.46E-03	0.430	6.68E-01

BETA, Regression coefficient; STAT, Coefficient t-statistic; P, Asymptotic p-value for t-statistic.

Supplementary Table 8. Results of SNPs with $P < 0.05$ of MHC region on chromosome 6p21.3-22.1 in Stage 1.

CHR	SNP	POSITION	A1	P	P (R)	OR	OR (R)	Q
6	rs10484435	26139790	C	1.09E-02	2.34E-02	1.48	1.47	0.27
6	rs2230654	26141620	A	3.63E-02	3.63E-02	0.86	0.86	0.43
6	rs7749823	26266058	C	4.18E-05	4.18E-05	0.62	0.62	0.61
6	rs17598927	26292619	C	1.45E-02	1.68E-02	1.18	1.18	0.31
6	rs1543681	26295762	G	4.30E-03	1.41E-02	0.83	0.83	0.24
6	rs2143346	26306428	C	5.25E-03	5.25E-03	1.21	1.21	0.59
6	rs1997768	26325707	C	3.68E-03	4.27E-03	1.21	1.21	0.31
6	rs2143345	26337127	T	2.52E-04	1.84E-03	1.29	1.29	0.24
6	rs16891467	26343945	C	8.94E-04	8.94E-04	1.26	1.26	0.35
6	rs3734534	26348628	A	3.33E-02	3.33E-02	1.25	1.25	0.78
6	rs11759720	26358233	G	5.61E-03	5.61E-03	1.20	1.20	0.36
6	rs9467704	26427465	A	1.26E-02	1.26E-02	0.73	0.73	0.71
6	rs6929846	26566244	A	8.85E-05	8.85E-05	0.71	0.71	0.97
6	rs6907857	26580329	G	2.27E-02	2.27E-02	0.81	0.81	0.39
6	rs7773913	26581962	T	9.20E-03	9.20E-03	0.76	0.76	1.00
6	rs16894368	27229203	A	8.83E-03	8.83E-03	0.78	0.78	0.49
6	rs6917419	27351459	T	1.42E-02	1.42E-02	0.86	0.86	0.54
6	rs200991	27923473	A	1.37E-02	1.37E-02	1.14	1.14	0.58
6	rs200956	27947725	G	6.32E-03	6.32E-03	1.15	1.15	0.38
6	rs203885	28184865	T	2.71E-02	2.71E-02	1.14	1.14	0.39
6	rs203884	28185353	T	7.84E-04	1.82E-02	1.15	1.15	0.15
6	rs1150683	28263293	A	1.17E-02	1.72E-02	1.16	1.16	0.33
6	rs9295762	28263397	C	3.65E-02	4.19E-02	1.10	1.10	0.35
6	rs2299030	28306734	G	2.85E-02	2.85E-02	1.21	1.21	0.79
6	rs7759855	28390842	C	5.00E-05	5.00E-05	0.68	0.68	0.81

6	rs9468344	28417548	C	1.40E-02	1.40E-02	0.91	0.91	0.86
6	rs6901001	28419098	G	1.67E-04	2.24E-04	0.73	0.73	0.36
6	rs6918631	28420435	A	1.06E-04	1.06E-04	0.69	0.69	0.83
6	rs2021745	28534965	G	4.90E-02	4.90E-02	0.93	0.93	0.80
6	rs6927023	28562200	T	2.93E-05	2.93E-05	0.67	0.67	0.61
6	rs454182	28619143	C	4.10E-02	4.10E-02	1.09	1.09	0.40
6	rs732395	28724306	T	1.82E-02	1.82E-02	0.90	0.90	0.91
6	rs7761914	28750488	G	1.04E-04	1.04E-04	0.69	0.69	0.84
6	rs2269554	29102968	T	2.96E-02	2.96E-02	0.92	0.92	0.59
6	rs10484544	29103698	C	4.29E-02	4.29E-02	0.93	0.93	0.56
6	rs16894557	29107805	A	6.78E-03	8.75E-03	0.90	0.90	0.34
6	rs2394514	29131193	C	1.31E-06	1.16E-05	1.39	1.39	0.27
6	rs3116816	29257421	T	2.43E-02	2.43E-02	0.92	0.92	0.69
6	rs2107192	29541921	T	4.11E-02	4.11E-02	0.89	0.89	0.53
6	rs11961013	29579913	T	5.10E-03	3.11E-02	1.37	1.37	0.20
6	rs3025657	29619195	C	9.46E-06	3.70E-02	0.75	0.75	0.01
6	rs29225	29689020	G	1.11E-02	1.11E-02	0.86	0.86	0.53
6	rs29273	29718968	G	2.28E-02	2.28E-02	1.28	1.28	0.84
6	rs3129090	29772110	A	3.24E-02	3.24E-02	1.25	1.25	0.74
6	rs3116788	29782176	G	3.62E-04	3.62E-04	0.82	0.82	0.60
6	rs9258126	29783770	C	2.63E-02	2.63E-02	1.26	1.26	0.78
6	rs6457009	29784516	T	6.70E-03	6.70E-03	1.11	1.11	0.56
6	rs7762253	29784802	T	2.95E-02	2.95E-02	1.09	1.09	0.76
6	rs3871467	29785228	A	7.27E-03	7.27E-03	1.11	1.11	0.47
6	rs1610593	29786499	T	2.22E-03	3.89E-02	0.87	0.87	0.12
6	rs1611381	29788471	T	2.25E-03	1.99E-02	0.87	0.87	0.18
6	rs1611388	29788768	G	2.47E-03	4.24E-02	0.87	0.88	0.11
6	rs2072898	29800708	G	2.08E-04	5.14E-04	0.83	0.83	0.32
6	rs2272874	29804224	C	2.85E-03	2.85E-03	0.87	0.87	0.71
6	rs2743925	29806029	C	1.87E-02	1.87E-02	1.22	1.22	0.98

6	rs9258205	29811802	G	1.80E-04	1.80E-04	0.84	0.84	0.39
6	rs1736913	29812379	T	4.60E-05	4.60E-05	0.80	0.80	0.55
6	rs9258215	29815286	C	5.74E-03	1.50E-02	0.86	0.86	0.26
6	rs2523386	29819726	A	4.38E-02	4.38E-02	1.33	1.33	0.40
6	rs2844845	29820738	A	2.04E-02	2.04E-02	1.29	1.29	0.94
6	rs1610630	29837265	G	1.57E-02	1.57E-02	1.29	1.29	0.94
6	rs1737055	29841721	T	3.50E-02	3.50E-02	0.92	0.92	0.86
6	rs1737030	29845542	T	3.70E-02	3.70E-02	0.92	0.92	0.43
6	rs1633002	29873026	A	3.74E-03	3.74E-03	1.20	1.20	0.97
6	rs1632973	29885150	A	3.19E-03	3.19E-03	1.20	1.20	0.96
6	rs1736963	29885962	A	9.22E-03	9.22E-03	1.17	1.17	0.66
6	rs9258466	29886192	G	1.08E-02	1.08E-02	1.17	1.17	0.85
6	rs3926748	29888311	T	1.20E-02	1.83E-02	0.89	0.89	0.33
6	rs753544	29888508	A	1.31E-03	1.31E-03	1.22	1.22	0.79
6	rs1318083	29891198	T	4.45E-03	4.45E-03	1.20	1.20	0.87
6	rs2517898	29907725	G	1.86E-05	2.68E-04	0.83	0.83	0.24
6	rs2254071	29914041	C	6.63E-05	6.63E-05	0.86	0.86	0.91
6	rs407238	29914880	C	2.26E-04	2.26E-04	1.23	1.23	0.79
6	rs2734990	29920484	T	2.14E-02	2.14E-02	0.91	0.91	0.42
6	rs2523767	29920786	G	3.95E-02	3.95E-02	0.89	0.89	0.32
6	rs2523765	29925085	A	3.63E-03	3.63E-03	1.19	1.19	0.47
6	rs3094159	29943813	C	4.51E-03	1.08E-02	0.90	0.90	0.29
6	rs3094157	29944218	C	3.52E-02	3.52E-02	1.28	1.28	0.39
6	rs3132718	29944556	A	3.03E-03	6.65E-03	0.89	0.89	0.30
6	rs1611637	29944720	T	2.22E-02	2.22E-02	0.91	0.91	0.44
6	rs1655902	30024834	G	5.71E-03	5.71E-03	1.24	1.24	0.55
6	rs2256902	30048351	A	7.97E-04	1.32E-02	0.82	0.81	0.15
6	rs9261035	30074154	T	1.47E-02	1.47E-02	1.37	1.37	0.69
6	rs6925061	30100265	T	1.17E-02	1.17E-02	1.35	1.35	0.50
6	rs11965452	30119781	T	2.45E-04	3.98E-02	0.78	0.78	0.05

6	rs9261265	30134329	G	1.16E-02	1.16E-02	1.35	1.35	0.50
6	rs9261317	30156284	A	1.78E-03	1.78E-03	1.50	1.50	0.75
6	rs6923832	30170037	A	1.75E-02	1.75E-02	1.33	1.33	0.60
6	rs12663184	30409579	T	2.80E-02	2.80E-02	1.16	1.16	0.76
6	rs4713325	30491421	G	2.14E-02	2.14E-02	0.88	0.88	0.51
6	rs4713328	30491855	A	7.51E-03	7.51E-03	0.88	0.88	0.64
6	rs2157605	30562055	G	4.12E-03	4.12E-03	0.88	0.88	0.53
6	rs11757629	30852508	G	8.43E-04	8.43E-04	0.75	0.75	0.45
6	rs4947289	30899388	A	5.64E-04	3.71E-02	1.18	1.20	0.08
6	rs2530709	31048548	G	2.76E-03	3.80E-02	0.89	0.87	0.08
6	rs12528087	31088582	T	4.98E-02	4.98E-02	1.22	1.22	0.93
6	rs9262545	31101041	T	3.75E-02	3.75E-02	1.17	1.17	0.87
6	rs2523897	31101937	T	6.68E-03	6.68E-03	1.12	1.12	0.45
6	rs6457300	31106721	G	4.70E-02	4.70E-02	0.90	0.90	0.49
6	rs3130991	31195333	G	2.78E-02	2.78E-02	0.90	0.90	0.94
6	rs9263715	31203780	A	5.48E-04	5.48E-04	1.14	1.14	0.57
6	rs9263716	31203795	T	2.56E-02	2.56E-02	1.11	1.11	0.33
6	rs3095238	31269189	T	3.04E-03	1.68E-02	1.20	1.21	0.21
6	rs4516988	31284581	C	1.75E-02	1.75E-02	0.76	0.76	0.40
6	rs9501522	31292404	A	3.87E-02	3.87E-02	0.81	0.81	0.53
6	rs2394894	31314899	C	1.19E-02	1.19E-02	1.12	1.12	0.90
6	rs2394895	31314958	G	1.16E-02	1.16E-02	1.12	1.12	0.89
6	rs3134762	31318845	G	1.24E-02	1.24E-02	1.12	1.12	0.95
6	rs2246954	31373241	T	2.43E-02	2.43E-02	1.09	1.09	0.43
6	rs2524123	31373293	C	1.98E-02	1.98E-02	1.09	1.09	0.73
6	rs2524095	31374096	A	7.84E-03	1.29E-02	1.12	1.12	0.32
6	rs16899205	31374340	G	4.10E-03	4.47E-02	0.89	0.88	0.09
6	rs2524089	31374501	G	6.37E-03	1.46E-02	1.12	1.12	0.28
6	rs2524066	31377133	T	1.45E-02	1.67E-02	1.11	1.11	0.35
6	rs9366778	31377152	C	1.97E-02	1.97E-02	1.09	1.09	0.49

6	rs2844569	31444583	A	3.85E-02	3.85E-02	1.12	1.12	0.84
6	rs2844546	31452636	A	2.18E-02	2.18E-02	1.11	1.11	0.50
6	rs2507984	31453575	A	1.96E-02	1.96E-02	1.12	1.12	0.75
6	rs2442749	31460019	G	6.65E-04	6.65E-04	1.17	1.17	0.65
6	rs2857605	31632830	C	4.23E-02	4.23E-02	1.12	1.12	0.51
6	rs13215091	31636669	T	3.20E-02	3.20E-02	1.17	1.17	0.52
6	rs9348876	31683255	A	4.71E-02	4.91E-02	1.09	1.09	0.36
6	rs2857597	31692979	T	1.17E-02	2.57E-02	1.25	1.26	0.25
6	rs1046089	31710946	T	1.19E-02	1.19E-02	0.91	0.91	0.47
6	rs805301	31726100	G	4.55E-03	4.55E-03	0.90	0.90	0.47
6	rs707922	31733486	A	3.61E-02	3.61E-02	0.90	0.90	0.95
6	rs707917	31765733	G	7.96E-03	7.96E-03	0.90	0.90	0.43
6	rs805293	31796497	A	2.27E-02	2.27E-02	1.10	1.10	0.88
6	rs4713479	31796778	T	4.76E-02	4.76E-02	0.90	0.90	0.99
6	rs707928	31850569	C	2.34E-03	2.34E-03	0.86	0.86	0.65
6	rs9267798	32152812	G	1.39E-02	1.39E-02	0.86	0.86	0.75
6	rs12663103	32269302	G	1.04E-02	1.04E-02	0.80	0.80	0.70
6	rs206015	32290737	T	3.94E-02	3.94E-02	1.09	1.09	0.47
6	rs16870123	32467438	T	4.41E-02	4.41E-02	0.77	0.77	0.50
6	rs17577980	32467799	A	1.93E-03	4.41E-02	1.26	1.28	0.11
6	rs6929953	32499966	T	3.44E-02	4.32E-02	1.19	1.20	0.32
6	rs3177928	32520413	T	3.04E-03	3.04E-03	0.66	0.66	0.90
6	rs9268856	32537697	A	2.81E-02	2.81E-02	0.89	0.89	0.88
6	rs9268878	32539270	T	1.13E-02	1.13E-02	0.88	0.88	0.94
6	rs17210980	32665279	C	2.03E-02	2.03E-02	0.88	0.88	0.87
6	rs9469220	32766288	C	1.76E-03	1.76E-03	0.89	0.89	0.58
6	rs2856717	32778286	T	2.79E-02	2.79E-02	0.91	0.91	0.39
6	rs12663935	32783168	C	4.93E-02	4.93E-02	0.73	0.73	0.44
6	rs9275793	32798005	C	4.39E-02	4.39E-02	0.88	0.88	0.58
6	rs9276227	32808662	A	1.06E-02	1.06E-02	1.22	1.22	0.50

6	rs9276299	32811086	G	2.01E-02	2.01E-02	1.20	1.20	0.88
6	rs1383264	32847945	T	1.89E-03	1.89E-03	0.84	0.84	0.92
6	rs376877	33132584	C	1.39E-02	1.39E-02	0.88	0.88	0.35
6	rs3129274	33202847	C	7.49E-03	7.49E-03	0.74	0.74	0.82

Note: 3,750 cases and 6,468 controls were used in stage 1 (i.e. BIOX GWAS), including the Northern Han sample set of 1,578 cases and 1,592 controls; the Central Han sample set of 1,238 cases and 2,856 controls; and the Southern Han sample set of 934 cases and 2,020 controls.
P, Fixed-effects meta-analysis p-value; P(R), Random-effects meta-analysis p-value; OR, Fixed-effects OR estimate, OR(R), Random-effects OR estimate; Q, p-value for Cochrane's Q statistic.

Supplementary Table 9. Genome-wide significant association of markers with schizophrenia in published studies.

Study	**Initial Sample Size**	**Replication Sample Size**	**Region**	**Reported Gene(s)**	**Strongest SNP-Risk Allele**	**OR[a]**	**RAF in Controls**	**P value**
International Schizophrenia Consortium. July 01, 2009, **Nature**. Common polygenic variation contributes to risk of schizophrenia and bipolar disorder.	3,322 European descent cases, 3,587 European descent controls	4,692 European descent cases, 15,493 European descent controls	6p22.1	*MHC*	rs13194053-T	1.22	0.86	9.50E-09
			6p21.32	*MHC*	rs3130297-C	1.34	0.89	4.79E-08
Shi J. July 01, 2009. **Nature**. Common variants on chromosome 6p22.1 are associated with schizophrenia.	2,681 European ancestry cases, 2,653 European ancestry controls, 1,286 African American cases, 973 African American controls	5,327 European ancestry cases, 16,424 European ancestry controls	6p22.1	*SLC17A1, SLC17A3, BTN3A2, BTN2A2, BTN3A1, HIST1H2AG, HIST1H2BJ, PRSS16, POM121L2, ZNF184*	rs6904071-G	1.25	0.81	1.78E-08
					rs926300-T	1.26	0.81	1.06E-08
					rs6913660-G	1.25	0.82	2.36E-08
					rs13219181-A	1.26	0.82	1.29E-08
					rs13194053-T	1.28	0.82	9.54E-09
					rs3800307-T	1.27	0.79	4.35E-08
					rs3800316-T	1.20	0.76	3.81E-08

Stefansson H. July 01, 2009. **Nature**. Common variants conferring risk of schizophrenia.	2,663 European cases, 13,498 European controls	10,282 European cases, 21,093 European controls	6p22.1	*MHC, HIST1H2BJ, PRSS16,PGBD1*	rs6913660-C	1.15	0.85	1.10E-09
					rs13219354-T	1.20	0.90	1.30E-10
					rs6932590-T	1.16	0.78	1.40E-12
					rs13211507-T	1.24	0.92	8.30E-11
			6p21.32	*MHC, NOTCH4*	rs3131296-G	1.19	0.87	2.30E-10
			11q24.2	*NRGN*	rs12807809-T	1.15	0.83	2.40E-09
			18q21.2	*TCF4*	rs9960767-C	1.23	0.06	4.10E-09

[a] For those SNPs with combined p values, but without combined OR values in the original publications, the OR values of the group with largest sample size were listed. RAF, Risk Allele Frequency.

Supplementary Table 10. Minor allele frequencies (HapMap CEU and HCB samples) of the markers, which are genome-wide significantly associated with schizophrenia in published studies.

CHR/Region	SNP	BP	Allele	MAF (HapMap-CEU)	MAF (HapMap-HCB)
6p22.1	rs6904071	27155235	A	0.142	0
6p22.1	rs926300	27167422	A	0.142	0
6p22.1	rs6913660	27199404	A	0.137	0
6p22.1	rs13219181	27244204	G	0.142	0
6p22.1	rs13194053	27251862	C	0.137	0
6p22.1	rs13219354	27293643	C	0.097	0
6p22.1	rs3800307	27293771	A	0.159	0
6p22.1	rs6932590	27356910	C	0.199	0.023
6p22.1	rs3800316	27364081	C	0.208	0.023
6p22.1	rs13211507	28365356	C	0.075	0

6p21.32	rs3130297	32280971	T	0.093	0
6p21.32	rs3131296	32280971	A	0.089	0.062
11q24.2	rs12807809	124111495	C	0.175	0.233
18q21.2	rs9960767	51306000	C	0.071	0.012

MAF, Minor allele frequency.

Supplementary Table 11. R-square values of the SNPs (genome-wide significantly associated with schizophrenia in published studies) with 149 SNPs within MHC region (with Pgwas-meta < 0.05 in our study) in HapMap HCB samples.

CHR	BP	SNP1	SNP2		
			rs6932590	**rs3800316**	**rs3131296**
6	26139790	rs10484435	0.001	0.002	0.003
6	26141620	rs2230654	0.007	0.011	0.005
6	26266058	rs7749823	0.001	0.002	0.003
6	26292619	rs17598927	0.348	0.196	0.188
6	26295762	rs1543681	0.021	0.082	0.023
6	26306428	rs2143346	0.348	0.195	0.186
6	26325707	rs1997768	0.320	0.178	0.168
6	26337127	rs2143345	0.384	0.224	0.220
6	26343945	rs16891467	0.384	0.224	0.220
6	26348628	rs3734534	0.002	0.003	0.071
6	26358233	rs11759720	0.295	0.160	0.148
6	26427465	rs9467704	0.002	0.003	0.006
6	26566244	rs6929846	0.007	0.011	0.019
6	26580329	rs6907857	0.005	0.007	0.012

6	26581962	rs7773913	0.005	0.007	0.012
6	27229203	rs16894368	0.002	0.003	0.006
6	27351459	rs6917419	0.009	0.017	0.023
6	27923473	rs200991	0.023	0.000	0.010
6	27947725	rs200956	0.026	0.000	0.013
6	28184865	rs203885	0.005	0.007	0.149
6	28185353	rs203884	0.037	0.037	0.003
6	28263293	rs1150683	0.006	0.009	0.303
6	28263397	rs9295762	0.041	0.165	0.002
6	28306734	rs2299030	0.007	0.011	0.005
6	28390842	rs7759855	0.005	0.007	0.012
6	28417548	rs9468344	0.003	0.005	0.000
6	28419098	rs6901001	0.005	0.007	0.012
6	28420435	rs6918631	0.005	0.007	0.012
6	28534965	rs2021745	0.064	0.014	0.025
6	28562200	rs6927023	0.005	0.007	0.012
6	28619143	rs454182	0.032	0.001	0.001
6	28724306	rs732395	0.066	0.101	0.017
6	28750488	rs7761914	0.006	0.009	0.016
6	29102968	rs2269554	0.053	0.082	0.080
6	29103698	rs10484544	0.053	0.082	0.080
6	29107805	rs16894557	0.037	0.058	0.101
6	29131193	rs2394514	0.114	0.176	0.008
6	29257421	rs3116816	0.053	0.082	0.080
6	29541921	rs2107192	0.003	0.022	0.010
6	29579913	rs11961013	0.477	0.294	0.780
6	29619195	rs3025657	0.026	0.008	0.000
6	29689020	rs29225	0.015	0.000	0.039

6	29718968	rs29273	0.002	0.003	0.071
6	29772110	rs3129090	0.004	0.006	0.034
6	29782176	rs3116788	0.001	0.008	0.032
6	29783770	rs9258126	0.002	0.003	0.071
6	29784516	rs6457009	0.005	0.040	0.147
6	29784802	rs7762253	0.005	0.040	0.147
6	29785228	rs3871467	0.005	0.040	0.147
6	29788471	rs1611381	0.001	0.008	0.032
6	29788768	rs1611388	0.001	0.008	0.032
6	29800708	rs2072898	0.018	0.003	0.002
6	29804224	rs2272874	0.000	0.003	0.019
6	29806029	rs2743925	0.002	0.003	0.071
6	29811802	rs9258205	0.000	0.003	0.019
6	29812379	rs1736913	0.001	0.001	0.036
6	29815286	rs9258215	0.000	0.003	0.019
6	29819726	rs2523386	0.002	0.003	0.071
6	29820738	rs2844845	0.002	0.003	0.071
6	29837265	rs1610630	0.005	0.007	0.012
6	29841721	rs1737055	0.005	0.002	0.037
6	29845542	rs1737030	0.004	0.002	0.039
6	29873026	rs1633002	0.115	0.177	0.497
6	29885150	rs1632973	0.104	0.160	0.454
6	29885962	rs1736963	0.104	0.160	0.454
6	29886192	rs9258466	0.104	0.160	0.454
6	29888311	rs3926748	0.064	0.021	0.000
6	29888508	rs753544	0.104	0.160	0.454
6	29891198	rs1318083	0.104	0.160	0.454
6	29907725	rs2517898	0.001	0.001	0.021

6	29914041	rs2254071	0.001	0.001	0.021
6	29920484	rs2734990	0.008	0.012	0.005
6	29920786	rs2523767	0.008	0.012	0.005
6	29925085	rs2523765	0.049	0.009	0.131
6	29943813	rs3094159	0.014	0.039	0.101
6	29944218	rs3094157	0.005	0.007	0.012
6	29944556	rs3132718	0.014	0.039	0.101
6	30024834	rs1655902	0.186	0.097	0.500
6	30048351	rs2256902	0.016	0.001	0.004
6	30074154	rs9261035	0.002	0.003	0.006
6	30100265	rs6925061	0.002	0.003	0.006
6	30119781	rs11965452	0.128	0.058	0.344
6	30134329	rs9261265	0.002	0.003	0.006
6	30156284	rs9261317	0.002	0.004	0.005
6	30170037	rs6923832	0.002	0.003	0.006
6	30409579	rs12663184	0.004	0.154	0.011
6	30491421	rs4713325	0.000	0.005	0.027
6	30491855	rs4713328	0.000	0.005	0.027
6	30562055	rs2157605	0.000	0.006	0.032
6	30852508	rs11757629	0.006	0.009	0.016
6	30899388	rs4947289	0.030	0.073	0.109
6	31048548	rs2530709	0.002	0.006	0.001
6	31088582	rs12528087	0.010	0.015	0.027
6	31101937	rs2523897	0.048	0.006	0.170
6	31106721	rs6457300	0.000	0.007	0.005
6	31195333	rs3130991	0.011	0.006	0.047
6	31203780	rs9263715	0.032	0.083	0.059
6	31203795	rs9263716	0.037	0.094	0.069

6	31269189	rs3095238	0.028	0.043	0.076
6	31284581	rs4516988	0.010	0.012	0.027
6	31292404	rs9501522	0.006	0.009	0.016
6	31314899	rs2394894	0.064	0.017	0.171
6	31314958	rs2394895	0.069	0.020	0.144
6	31318845	rs3134762	0.064	0.017	0.171
6	31373241	rs2246954	0.005	0.007	0.129
6	31373293	rs2524123	0.000	0.025	0.059
6	31374096	rs2524095	0.015	0.023	0.108
6	31374340	rs16899205	0.030	0.004	0.007
6	31374501	rs2524089	0.015	0.023	0.108
6	31377133	rs2524066	0.016	0.024	0.105
6	31377152	rs9366778	0.000	0.026	0.062
6	31444583	rs2844569	0.008	0.001	0.004
6	31452636	rs2844546	0.000	0.004	0.026
6	31453575	rs2507984	0.000	0.004	0.026
6	31460019	rs2442749	0.000	0.003	0.033
6	31632830	rs2857605	0.026	0.008	0.000
6	31636669	rs13215091	0.042	0.017	0.002
6	31683255	rs9348876	0.002	0.018	0.070
6	31692979	rs2857597	0.003	0.005	0.009
6	31710946	rs1046089	0.075	0.014	0.257
6	31726100	rs805301	0.073	0.014	0.251
6	31733486	rs707922	0.012	0.018	0.000
6	31765733	rs707917	0.073	0.014	0.251
6	31796497	rs805293	0.005	0.011	0.030
6	31796778	rs4713479	0.013	0.020	0.000
6	31850569	rs707928	0.011	0.002	0.001

6	32152812	rs9267798	0.017	0.027	0.006
6	32269302	rs12663103	0.003	0.005	0.009
6	32290737	rs206015	0.006	0.002	0.045
6	32467438	rs16870123	0.004	0.006	0.011
6	32467799	rs17577980	0.002	0.003	0.005
6	32499966	rs6929953	0.014	0.022	0.029
6	32520413	rs3177928	0.002	0.003	0.006
6	32537697	rs9268856	0.000	0.007	0.001
6	32539270	rs9268878	0.000	0.007	0.001
6	32665279	rs17210980	0.030	0.046	0.026
6	32766288	rs9469220	0.054	0.000	0.073
6	32778286	rs2856717	0.018	0.013	0.048
6	32783168	rs12663935	0.002	0.003	0.006
6	32798005	rs9275793	0.008	0.042	0.005
6	32808662	rs9276227	0.039	0.014	0.050
6	32811086	rs9276299	0.007	0.011	0.019
6	32847945	rs1383264	0.020	0.031	0.000
6	33132584	rs376877	0.017	0.000	0.047
6	33202847	rs3129274	0.005	0.007	0.012

Supplementary Table 12. R-square values of the SNPs (genome-wide significantly associated with schizophrenia in published studies) with 149 SNPs within MHC region (with Pgwas-meta < 0.05 in our study) in HapMap CEU samples.

CHR	BP	SNP1	SNP2											
			rs6904071	rs926300	rs6913660	rs13219181	rs13194053	rs13219354	rs3800307	rs6932590	rs13211507	rs3800316	rs3131296	rs3130297
6	26139790	rs10484435	0.440	0.440	0.440	0.440	0.440	0.512	0.442	0.367	0.765	0.312	0.166	0.193
6	26141620	rs2230654	0.013	0.013	0.013	0.013	0.013	0.007	0.006	0.001	0.018	0.000	0.063	0.059
6	26266058	rs7749823	0.644	0.644	0.644	0.644	0.644	0.626	0.527	0.623	0.787	0.625	0.126	0.150
6	26292619	rs17598927	0.002	0.002	0.002	0.002	0.002	0.000	0.003	0.004	0.000	0.002	0.004	0.007
6	26295762	rs1543681	0.072	0.072	0.072	0.072	0.072	0.082	0.062	0.034	0.081	0.030	0.004	0.016
6	26306428	rs2143346	0.007	0.007	0.007	0.007	0.007	0.020	0.003	0.001	0.011	0.002	0.002	0.001
6	26325707	rs1997768	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.007	0.010	0.004	0.037	0.033
6	26337127	rs2143345	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.007	0.010	0.004	0.037	0.033
6	26343945	rs16891467	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.007	0.010	0.004	0.037	0.033
6	26348628	rs3734534	0.013	0.013	0.013	0.013	0.013	0.007	0.000	0.011	0.018	0.007	0.021	0.018
6	26358233	rs11759720	0.001	0.001	0.001	0.001	0.001	0.004	0.001	0.023	0.022	0.015	0.061	0.055
6	26427465	rs9467704	0.717	0.717	0.717	0.717	0.717	0.814	0.602	0.513	1.000	0.440	0.190	0.219
6	26566244	rs6929846	0.047	0.047	0.047	0.047	0.047	0.099	0.072	0.040	0.083	0.022	0.100	0.094
6	27229203	rs16894368	0.032	0.032	0.032	0.032	0.032	0.004	0.028	0.022	0.004	0.132	0.004	0.004
6	27351459	rs6917419	0.000	0.000	0.000	0.000	0.000	0.002	0.003	0.011	0.000	0.003	0.030	0.003
6	27923473	rs200991	0.410	0.410	0.410	0.410	0.410	0.489	0.387	0.372	0.637	0.312	0.108	0.132
6	27947725	rs200956	0.402	0.402	0.402	0.402	0.402	0.482	0.377	0.362	0.633	0.302	0.127	0.156
6	28184865	rs203885	0.007	0.007	0.007	0.007	0.007	0.005	0.013	0.019	0.002	0.019	0.002	0.001
6	28185353	rs203884	0.183	0.183	0.183	0.183	0.183	0.202	0.144	0.114	0.310	0.112	0.108	0.080
6	28263293	rs1150683	0.007	0.007	0.007	0.007	0.007	0.005	0.013	0.019	0.002	0.019	0.002	0.001
6	28263397	rs9295762	0.220	0.220	0.220	0.220	0.220	0.233	0.186	0.196	0.336	0.191	0.121	0.089
6	28306734	rs2299030	0.007	0.007	0.007	0.007	0.007	0.005	0.013	0.003	0.002	0.004	0.025	0.023
6	28417548	rs9468344	0.158	0.158	0.158	0.158	0.158	0.210	0.132	0.276	0.303	0.225	0.022	0.033

6	28534965	rs2021745	0.007	0.007	0.007	0.007	0.007	0.002	0.000	0.000	0.000	0.001	0.009	0.000
6	28619143	rs454182	0.014	0.014	0.014	0.014	0.014	0.013	0.021	0.016	0.002	0.011	0.035	0.016
6	28724306	rs732395	0.013	0.013	0.013	0.013	0.013	0.018	0.013	0.003	0.006	0.000	0.000	0.001
6	29102968	rs2269554	0.050	0.050	0.050	0.050	0.050	0.065	0.069	0.037	0.055	0.039	0.033	0.029
6	29103698	rs10484544	0.050	0.050	0.050	0.050	0.050	0.065	0.069	0.037	0.055	0.039	0.033	0.029
6	29107805	rs16894557	0.015	0.015	0.015	0.015	0.015	0.039	0.021	0.032	0.033	0.032	0.006	0.004
6	29131193	rs2394514	0.005	0.005	0.005	0.005	0.005	0.001	0.013	0.024	0.004	0.026	0.012	0.001
6	29257421	rs3116816	0.050	0.050	0.050	0.050	0.050	0.065	0.069	0.037	0.055	0.039	0.033	0.029
6	29541921	rs2107192	0.051	0.051	0.051	0.051	0.051	0.052	0.040	0.052	0.026	0.058	0.031	0.023
6	29689020	rs29225	0.037	0.037	0.037	0.037	0.037	0.061	0.006	0.015	0.052	0.017	0.063	0.059
6	29718968	rs29273	0.029	0.029	0.029	0.029	0.029	0.017	0.027	0.000	0.022	0.000	0.061	0.055
6	29772110	rs3129090	0.056	0.056	0.056	0.056	0.056	0.045	0.069	0.002	0.041	0.003	0.051	0.048
6	29782176	rs3116788	0.012	0.012	0.012	0.012	0.012	0.009	0.010	0.001	0.002	0.004	0.002	0.006
6	29783770	rs9258126	0.092	0.092	0.092	0.092	0.092	0.076	0.078	0.004	0.064	0.006	0.077	0.072
6	29784516	rs6457009	0.086	0.086	0.086	0.086	0.086	0.121	0.059	0.023	0.161	0.020	0.148	0.206
6	29784802	rs7762253	0.106	0.106	0.106	0.106	0.106	0.141	0.078	0.038	0.181	0.034	0.170	0.229
6	29785228	rs3871467	0.085	0.085	0.085	0.085	0.085	0.121	0.057	0.022	0.160	0.020	0.148	0.205
6	29788471	rs1611381	0.012	0.012	0.012	0.012	0.012	0.009	0.010	0.001	0.002	0.004	0.002	0.006
6	29788768	rs1611388	0.012	0.012	0.012	0.012	0.012	0.009	0.010	0.001	0.002	0.004	0.002	0.006
6	29800708	rs2072898	0.007	0.007	0.007	0.007	0.007	0.004	0.012	0.020	0.025	0.020	0.001	0.001
6	29804224	rs2272874	0.011	0.011	0.011	0.011	0.011	0.007	0.018	0.026	0.025	0.027	0.004	0.003
6	29806029	rs2743925	0.124	0.124	0.124	0.124	0.124	0.102	0.118	0.029	0.086	0.032	0.104	0.098
6	29811802	rs9258205	0.011	0.011	0.011	0.011	0.011	0.007	0.018	0.026	0.025	0.027	0.004	0.003
6	29812379	rs1736913	0.002	0.002	0.002	0.002	0.002	0.003	0.004	0.018	0.010	0.010	0.002	0.000
6	29815286	rs9258215	0.011	0.011	0.011	0.011	0.011	0.007	0.018	0.026	0.025	0.027	0.004	0.003
6	29819726	rs2523386	0.110	0.110	0.110	0.110	0.110	0.091	0.063	0.003	0.077	0.005	0.092	0.087
6	29820738	rs2844845	0.105	0.105	0.105	0.105	0.105	0.086	0.052	0.000	0.074	0.000	0.083	0.078
6	29837265	rs1610630	0.014	0.014	0.014	0.014	0.014	0.008	0.004	0.000	0.007	0.004	0.008	0.012
6	29841721	rs1737055	0.001	0.001	0.001	0.001	0.001	0.000	0.002	0.011	0.001	0.004	0.013	0.020
6	29845542	rs1737030	0.010	0.010	0.010	0.010	0.010	0.009	0.000	0.003	0.017	0.000	0.020	0.031

6	29873026	rs1633002	0.025	0.025	0.025	0.025	0.025	0.061	0.045	0.043	0.080	0.025	0.024	0.043
6	29885150	rs1632973	0.025	0.025	0.025	0.025	0.025	0.061	0.045	0.043	0.080	0.025	0.024	0.043
6	29885962	rs1736963	0.025	0.025	0.025	0.025	0.025	0.061	0.045	0.043	0.080	0.025	0.024	0.043
6	29886192	rs9258466	0.025	0.025	0.025	0.025	0.025	0.061	0.045	0.043	0.080	0.025	0.024	0.043
6	29888311	rs3926748	0.008	0.008	0.008	0.008	0.008	0.014	0.002	0.000	0.033	0.000	0.040	0.049
6	29888508	rs753544	0.025	0.025	0.025	0.025	0.025	0.061	0.045	0.043	0.080	0.025	0.024	0.043
6	29891198	rs1318083	0.019	0.019	0.019	0.019	0.019	0.052	0.037	0.035	0.071	0.019	0.023	0.042
6	29907725	rs2517898	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.012	0.000	0.016	0.000	0.002
6	29914041	rs2254071	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.015	0.000	0.019	0.000	0.001
6	29920484	rs2734990	0.008	0.008	0.008	0.008	0.008	0.010	0.011	0.030	0.008	0.034	0.001	0.000
6	29920786	rs2523767	0.017	0.017	0.017	0.017	0.017	0.018	0.023	0.030	0.015	0.036	0.001	0.001
6	29925085	rs2523765	0.073	0.073	0.073	0.073	0.073	0.093	0.062	0.053	0.133	0.053	0.040	0.064
6	29943813	rs3094159	0.004	0.004	0.004	0.004	0.004	0.004	0.025	0.060	0.001	0.041	0.000	0.002
6	29944218	rs3094157	0.002	0.002	0.002	0.002	0.002	0.001	0.000	0.001	0.007	0.001	0.001	0.002
6	29944556	rs3132718	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.028	0.001	0.018	0.002	0.006
6	30024834	rs1655902	0.002	0.002	0.002	0.002	0.002	0.001	0.000	0.001	0.007	0.001	0.001	0.002
6	30048351	rs2256902	0.000	0.000	0.000	0.000	0.000	0.002	0.019	0.066	0.000	0.053	0.000	0.000
6	30074154	rs9261035	0.048	0.048	0.048	0.048	0.048	0.039	0.025	0.008	0.033	0.009	0.040	0.037
6	30100265	rs6925061	0.044	0.044	0.044	0.044	0.044	0.036	0.018	0.004	0.031	0.005	0.035	0.032
6	30134329	rs9261265	0.046	0.046	0.046	0.046	0.046	0.038	0.023	0.009	0.032	0.010	0.038	0.036
6	30156284	rs9261317	0.046	0.046	0.046	0.046	0.046	0.038	0.023	0.009	0.032	0.010	0.038	0.036
6	30170037	rs6923832	0.046	0.046	0.046	0.046	0.046	0.038	0.023	0.009	0.032	0.010	0.038	0.036
6	30409579	rs12663184	0.066	0.066	0.066	0.066	0.066	0.050	0.055	0.046	0.036	0.048	0.006	0.010
6	30491421	rs4713325	0.051	0.051	0.051	0.051	0.051	0.050	0.022	0.006	0.019	0.003	0.022	0.004
6	30491855	rs4713328	0.051	0.051	0.051	0.051	0.051	0.050	0.022	0.006	0.019	0.003	0.022	0.004
6	30562055	rs2157605	0.051	0.051	0.051	0.051	0.051	0.050	0.022	0.006	0.019	0.003	0.022	0.004
6	30852508	rs11757629	0.010	0.010	0.010	0.010	0.010	0.008	0.013	0.017	0.007	0.016	0.009	0.008
6	30899388	rs4947289	0.037	0.037	0.037	0.037	0.037	0.061	0.024	0.015	0.052	0.017	0.063	0.059
6	31048548	rs2530709	0.004	0.004	0.004	0.004	0.004	0.005	0.000	0.000	0.000	0.000	0.005	0.002
6	31088582	rs12528087	0.010	0.010	0.010	0.010	0.010	0.006	0.017	0.004	0.027	0.005	0.003	0.002

6	31101937	rs2523897	0.001	0.001	0.001	0.001	0.001	0.000	0.002	0.011	0.006	0.004	0.008	0.002
6	31106721	rs6457300	0.048	0.048	0.048	0.048	0.048	0.052	0.055	0.041	0.029	0.045	0.036	0.028
6	31195333	rs3130991	0.125	0.125	0.125	0.125	0.125	0.137	0.131	0.047	0.118	0.051	0.008	0.037
6	31203780	rs9263715	0.114	0.114	0.114	0.114	0.114	0.095	0.072	0.069	0.080	0.071	0.006	0.043
6	31203795	rs9263716	0.114	0.114	0.114	0.114	0.114	0.095	0.072	0.069	0.080	0.071	0.006	0.043
6	31269189	rs3095238	0.023	0.023	0.023	0.023	0.023	0.042	0.016	0.004	0.020	0.001	0.008	0.014
6	31284581	rs4516988	0.063	0.063	0.063	0.063	0.063	0.071	0.022	0.026	0.081	0.015	0.057	0.049
6	31292404	rs9501522	0.042	0.042	0.042	0.042	0.042	0.034	0.024	0.034	0.029	0.034	0.007	0.005
6	31314899	rs2394894	0.086	0.086	0.086	0.086	0.086	0.065	0.063	0.069	0.110	0.072	0.187	0.147
6	31314958	rs2394895	0.080	0.080	0.080	0.080	0.080	0.059	0.056	0.061	0.105	0.064	0.180	0.141
6	31318845	rs3134762	0.086	0.086	0.086	0.086	0.086	0.065	0.063	0.069	0.110	0.072	0.187	0.147
6	31373241	rs2246954	0.041	0.041	0.041	0.041	0.041	0.051	0.030	0.005	0.056	0.003	0.099	0.085
6	31373293	rs2524123	0.109	0.109	0.109	0.109	0.109	0.110	0.067	0.022	0.115	0.015	0.034	0.045
6	31374096	rs2524095	0.077	0.077	0.077	0.077	0.077	0.085	0.068	0.029	0.088	0.025	0.106	0.090
6	31374340	rs16899205	0.017	0.017	0.017	0.017	0.017	0.008	0.021	0.012	0.007	0.015	0.048	0.042
6	31374501	rs2524089	0.086	0.086	0.086	0.086	0.086	0.094	0.077	0.035	0.096	0.031	0.116	0.099
6	31377133	rs2524066	0.077	0.077	0.077	0.077	0.077	0.085	0.068	0.029	0.088	0.025	0.106	0.090
6	31377152	rs9366778	0.053	0.053	0.053	0.053	0.053	0.033	0.066	0.058	0.028	0.064	0.059	0.050
6	31444583	rs2844569	0.136	0.136	0.136	0.136	0.136	0.092	0.121	0.080	0.129	0.104	0.109	0.108
6	31452636	rs2844546	0.145	0.145	0.145	0.145	0.145	0.106	0.125	0.081	0.152	0.104	0.092	0.091
6	31453575	rs2507984	0.125	0.125	0.125	0.125	0.125	0.086	0.107	0.067	0.125	0.091	0.109	0.108
6	31460019	rs2442749	0.158	0.158	0.158	0.158	0.158	0.131	0.124	0.097	0.207	0.099	0.187	0.180
6	31632830	rs2857605	0.001	0.001	0.001	0.001	0.001	0.008	0.009	0.000	0.001	0.000	0.011	0.006
6	31636669	rs13215091	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.004	0.001	0.005	0.018	0.017
6	31683255	rs9348876	0.019	0.019	0.019	0.019	0.019	0.013	0.008	0.015	0.007	0.016	0.009	0.007
6	31692979	rs2857597	0.006	0.006	0.006	0.006	0.006	0.014	0.004	0.011	0.021	0.007	0.025	0.017
6	31710946	rs1046089	0.023	0.023	0.023	0.023	0.023	0.029	0.022	0.022	0.064	0.024	0.119	0.086
6	31726100	rs805301	0.017	0.017	0.017	0.017	0.017	0.023	0.016	0.029	0.054	0.031	0.103	0.073
6	31733486	rs707922	0.019	0.019	0.019	0.019	0.019	0.016	0.024	0.000	0.013	0.000	0.016	0.015
6	31765733	rs707917	0.014	0.014	0.014	0.014	0.014	0.016	0.008	0.000	0.013	0.000	0.039	0.056

6	31796497	rs805293	0.011	0.011	0.011	0.011	0.011	0.007	0.028	0.017	0.018	0.025	0.044	0.032
6	31796778	rs4713479	0.021	0.021	0.021	0.021	0.021	0.018	0.027	0.004	0.015	0.005	0.018	0.017
6	31850569	rs707928	0.003	0.003	0.003	0.003	0.003	0.005	0.004	0.017	0.023	0.021	0.109	0.102
6	32152812	rs9267798	0.027	0.027	0.027	0.027	0.027	0.038	0.015	0.030	0.024	0.023	0.005	0.004
6	32269302	rs12663103	0.006	0.006	0.006	0.006	0.006	0.003	0.000	0.004	0.001	0.003	0.001	0.000
6	32290737	rs206015	0.019	0.019	0.019	0.019	0.019	0.013	0.030	0.015	0.007	0.016	0.009	0.007
6	32467438	rs16870123	0.027	0.027	0.027	0.027	0.027	0.005	0.030	0.060	0.004	0.076	0.078	0.073
6	32467799	rs17577980	0.027	0.027	0.027	0.027	0.027	0.022	0.035	0.044	0.019	0.043	0.000	0.000
6	32520413	rs3177928	0.011	0.011	0.011	0.011	0.011	0.000	0.027	0.027	0.000	0.038	0.055	0.049
6	32537697	rs9268856	0.101	0.101	0.101	0.101	0.101	0.139	0.060	0.059	0.180	0.044	0.308	0.362
6	32539270	rs9268878	0.101	0.101	0.101	0.101	0.101	0.139	0.060	0.059	0.180	0.044	0.308	0.362
6	32665279	rs17210980	0.005	0.005	0.005	0.005	0.005	0.004	0.007	0.008	0.004	0.008	0.004	0.004
6	32766288	rs9469220	0.014	0.014	0.014	0.014	0.014	0.020	0.008	0.004	0.020	0.002	0.074	0.060
6	32798005	rs9275793	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.022	0.001	0.010	0.014
6	32808662	rs9276227	0.001	0.001	0.001	0.001	0.001	0.005	0.007	0.018	0.000	0.020	0.051	0.047
6	32811086	rs9276299	0.004	0.004	0.004	0.004	0.004	0.001	0.011	0.021	0.000	0.022	0.023	0.020
6	32847945	rs1383264	0.041	0.041	0.041	0.041	0.041	0.044	0.021	0.019	0.019	0.017	0.074	0.080
6	33132584	rs376877	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.001	0.002	0.002	0.011	0.008
6	33202847	rs3129274	0.028	0.028	0.028	0.028	0.028	0.037	0.013	0.011	0.050	0.013	0.193	0.192

Supplementary Sample Information

All individuals provided written, informed consent for participation and approval was obtained from the ethics committees at each location.

1. BIOX samples

All schizophrenia patients analyzed in this study were interviewed by 2 independent psychiatrists, diagnosed according to DSM-IV criteria and had a 2-year history of schizophrenia. All healthy controls were randomly selected from Chinese Han volunteers who were requested to reply to a written invitation to evaluate their medical history. Practice lists of controls were screened for potentially suitable volunteers by excluding subjects with major mental illness.

In the BIOX GWAS, the Northern Han sample set of 1,578 cases and 1,592 controls were recruited from Beijing and Shandong Province; the Central Han sample set of 1,238 cases and 2,856 controls were recruited from Shanghai and Anhui Province; and the Southern Han sample set of 934 cases and 2,020 controls were recruited from Guangdong and Guangxi Provinces.

In the replication stage, 4,383 schizophrenia cases and 4,539 healthy controls recruited from Shanghai were analyzed. All subjects in the replication stage were unrelated and born in Shanghai and their parents had to be local residents of Shanghai as well.

Details also can be found in Online Methods and supplementary table 1.

2. SGENE-plus samples

Denmark/Copenhagen. The Danish sample included 513 patients and 471 controls. Patients were recruited to the Danish Psychiatric Biobank from the psychiatric departments of the six hospitals in the Copenhagen region and were clinically diagnosed with schizophrenia according to ICD-10 (F20) without ever having received a diagnosis of mania or bipolar illness (F30 or F31). An experienced research-and-consultant psychiatrist verified the high reliability of the clinical diagnoses using the Operational Criteria Checklist for Psychotic and Affective Illness (OPCRIT)[1]. The controls were recruited through the Danish Blood Donor Corps in the Copenhagen area; apparent behavioral abnormality was an exclusion criterion.

England. The English sample included 93 schizophrenia patients drawn from the Maudsley Family Study of psychosis[2], the psychosis twin study[3], and the genetics and psychosis (GAP) study[4] and 88 unrelated controls with no history of major mental illness. Patients were interviewed with the Schedule for Affective Disorders and Schizophrenia Lifetime Version (SADS-L)[5] or the Item Group Checklist (IGC) of the Schedule for Clinical Assessment in

Neuropsychiatry (SCAN)[6] and diagnosed according to International Classification of Disease, 10th revision, Diagnostic Criteria for Research (ICD-10-DCR).

Finland. The Finnish sample was made up of 182 schizophrenia patients drawn from a nationwide collection of families with schizophrenia spectrum disorders and 197 controls. Patients were diagnosed by two independent psychiatrists, blind to family structures, who made a consensus diagnosis to give best-estimate lifetime diagnoses according to Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria. Controls were derived from the Health 2000 survey[7,8]. Of the patients finally included, 123 were from Kuusamo, an internal isolate of Finland having a 3.0% age corrected lifetime risk for schizophrenia compared to 1.1% in the general population[9], and 59 came from outside of Kuusamo. Of the controls finally included, 50 were from Kuusamo and 147 were from outside of Kuusamo.

Germany/Bonn. The Bonn sample was comprised of 483 patients and 367 controls. Patients were recruited from consecutive hospital admissions. At least two experienced psychiatrists/psychologists made lifetime, best-estimate diagnoses according to DSM-IV criteria using multiple sources of information including structured interviews with the SCID[10] or the SADS-L[5], OPCRIT[1] data, medical records, and family history. Controls were derived from the Heinz

Nixdorf Recall study.

Germany (Munich). The German genome-wide typed sample consisted of 565 cases and 604 controls. Cases diagnosed with DSM-IV schizophrenia were ascertained from the Munich area. Detailed medical and psychiatric histories were collected, including a clinical interview using the Structured Clinical Interview for Axis I DSM-IV Disorders (SCID)[10]. Exclusion criteria included a history of head injury or neurological diseases. The controls were unrelated volunteers randomly selected from the general population of Munich. To exclude subjects with central neurological diseases and psychotic disorders or subjects who had first-degree relatives with psychotic disorders, several screenings were conducted before the volunteers were enrolled in the study.

Iceland. The Icelandic sample consisted of 531 cases and 11,615 controls after quality control. Patients and controls were recruited from all over Iceland. Diagnoses were assigned according to Research Diagnostic Criteria (RDC)[11] through the use of the SADS-L[5]. The controls were recruited as a part of various genetic programs at deCODE.

Italy. The Italian sample consisted of 84 patients and 89 controls remained following QC. Patients were interviewed using the IGC[6] and diagnosed with schizophrenia according to ICD-10-DCR. Controls were unrelated volunteers randomly selected from the general population of South Verona.

The Netherlands. The Dutch sample consisted of 693 patients and 629 controls. In-patients and out-patients were recruited from different psychiatric hospitals and institutions throughout the Netherlands, coordinated via academic hospitals in Amsterdam, Groningen, Maastricht and Utrecht. Detailed medical and psychiatric histories were collected, including the Comprehensive Assessment of Symptoms and History (CASH), an instrument for assessing diagnosis and psychopathology[12]. Only patients with a DSM-IV diagnosis of schizophrenia were included as cases. Controls were volunteers that were free of any history of psychiatric disorders.

Scotland. The Scottish sample was comprised of 658 schizophrenia cases and 661 controls. All participants self-identified as born in the British Isles (95% in Scotland). Cases met DSM-IV and ICD-10 criteria for schizophrenia with diagnosis made by OPCRIT[1]. Controls were volunteers recruited through general practices in Scotland. Practice lists were screened for potentially suitable volunteers by age and sex, and subjects with major mental illness or use of antipsychotic medication were excluded.

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