

Title: Evaluation of genetic susceptibility of common variants in *CACNA1D* with schizophrenia in Han Chinese

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TableS1 Allele and genotype frequency of single SNP association analysis in the testing dataset

| Makers | | Allele Freq. (%) | | p-value ¹ | Genotype Freq. (%) | | | p-value ¹ | H-WE p value |
|-------------|------------|------------------|-------------|----------------------|--------------------|------------|------------|----------------------|--------------|
| SNP ID / bp | | | | | | | | | |
| | rs312480 | C | T | | CC | CT | TT | | |
| SCZ | 53,495,113 | 1990(89.08) | 244(10.92) | 0.171346 | 889(79.59) | 212(18.98) | 16(1.43) | 0.39283 | 0.411 |
| CTR | | 3274(90.19) | 356(9.81) | | 1479(81.49) | 316(17.41) | 20(1.1) | | 0.5 |
| | rs219847 | A | G | | AA | AG | GG | | |
| SCZ | 53,499,800 | 1206(53.98) | 1028(46.02) | 0.361012 | 327(29.27) | 552(49.42) | 238(21.31) | 0.629978 | 0.859 |
| CTR | | 2004(55.21) | 1626(44.79) | | 561(30.91) | 882(48.6) | 372(20.5) | | 0.457 |
| | rs6763768 | T | C | | TT | TC | CC | | |
| SCZ | 53,503,852 | 1471(65.85) | 763(34.15) | 0.164871 | 327(29.27) | 552(49.42) | 238(21.31) | 0.629978 | 0.859 |
| CTR | | 2454(67.6) | 1176(32.4) | | 561(30.91) | 882(48.6) | 372(20.5) | | 0.555 |
| | rs3774419 | G | A | | GG | GA | AA | | |
| SCZ | 53,511,535 | 1699(76.05) | 535(23.95) | 0.464696 | 643(57.56) | 413(36.97) | 61(5.46) | 0.75743 | 0.615 |
| CTR | | 2730(75.21) | 900(24.79) | | 1020(56.2) | 690(38.02) | 105(5.79) | | 0.408 |
| | rs312487 | C | T | | CC | CT | TT | | |
| SCZ | 53,511,595 | 1145(51.25) | 1089(48.75) | 0.394802 | 290(25.96) | 565(50.58) | 262(23.46) | 0.674224 | 0.682 |
| CTR | | 1902(52.4) | 1728(47.6) | | 497(27.38) | 908(50.03) | 410(22.59) | | 0.903 |
| | rs17053118 | C | T | | CC | CT | TT | | |
| SCZ | 53,514,902 | 1829(81.87) | 405(18.13) | 0.193 | 748(66.97) | 333(29.81) | 36(3.22) | 0.426531 | 0.886 |
| CTR | | 3020(83.2) | 610(16.8) | | 1256(69.2) | 508(27.99) | 51(2.81) | | 0.966 |
| | rs312481 | G | A | | GG | GA | AA | | |
| SCZ | 53,517,875 | 1795(80.35) | 439(19.65) | 0.479508 | 719(64.37) | 357(31.96) | 41(3.67) | 0.77304 | 0.686 |
| CTR | | 2889(79.59) | 741(20.41) | | 1145(63.09) | 599(33) | 71(3.91) | | 0.503 |
| | rs979220 | T | C | | TT | TC | CC | | |
| SCZ | 53,522,196 | 2033(91) | 201(9) | 0.188377 | 926(82.9) | 181(16.2) | 10(0.9) | 0.424737 | 0.726 |
| CTR | | 3339(91.98) | 291(8.02) | | 1537(84.68) | 265(14.6) | 13(0.72) | | 0.671 |
| | rs3774424 | G | T | | GG | GT | TT | | |
| SCZ | 53,522,631 | 1890(84.6) | 344(15.4) | 0.690047 | 800(71.62) | 290(25.96) | 27(2.42) | 0.923396 | 0.906 |
| CTR | | 3085(84.99) | 545(15.01) | | 1312(72.29) | 461(25.4) | 42(2.31) | | 0.841 |
| | rs9311502 | T | C | | TT | TC | CC | | |
| SCZ | 53,526,294 | 1458(65.26) | 776(34.74) | 0.331342 | 471(42.17) | 516(46.2) | 130(11.64) | 0.614988 | 0.529 |
| CTR | | 2414(66.5) | 1216(33.5) | | 797(43.91) | 820(45.18) | 198(10.91) | | 0.55 |
| | rs17053141 | G | A | | GG | GA | AA | | |
| SCZ | 53,526,895 | 2088(93.46) | 146(6.54) | 0.150744 | 977(87.47) | 134(12) | 6(0.54) | 0.227899 | 0.547 |
| CTR | | 3426(94.38) | 204(5.62) | | 1617(89.09) | 192(10.58) | 6(0.33) | | 0.906 |
| | rs3774429 | G | A | | GG | GA | AA | | |
| SCZ | 53,532,379 | 1941(86.88) | 293(13.12) | 0.170041 | 840(75.2) | 261(23.37) | 16(1.43) | 0.205917 | 0.399 |
| CTR | | 3198(88.1) | 432(11.9) | | 1412(77.8) | 374(20.61) | 29(1.6) | | 0.461 |
| | rs3774437 | C | T | | CC | CT | TT | | |
| SCZ | 53,534,890 | 1942(86.93) | 292(13.07) | 0.316956 | 846(75.74) | 250(22.38) | 21(1.88) | 0.572593 | 0.614 |

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|-----|------------|-------------|-------------|----------|-------------|------------|------------|----------|-------|
| CTR | | 3122(86.01) | 508(13.99) | | 1343(73.99) | 436(24.02) | 36(1.98) | | 0.929 |
| | rs13078747 | T | C | | TT | TC | CC | | |
| SCZ | 53,539,490 | 1711(76.59) | 523(23.41) | 0.212894 | 650(58.19) | 411(36.79) | 56(5.01) | 0.246743 | 0.384 |
| CTR | | 2831(77.99) | 799(22.01) | | 1109(61.1) | 613(33.77) | 93(5.12) | | 0.488 |
| | rs3774439 | T | A | | TT | TA | AA | | |
| SCZ | 53,547,698 | 1758(78.69) | 476(21.31) | 0.315946 | 690(61.77) | 378(33.84) | 49(4.39) | 0.525164 | 0.76 |
| CTR | | 2816(77.58) | 814(22.42) | | 1096(60.39) | 624(34.38) | 95(5.23) | | 0.614 |
| | rs6764908 | T | C | | TT | TC | CC | | |
| SCZ | 53,549,441 | 1824(81.65) | 410(18.35) | 0.175897 | 748(66.97) | 328(29.36) | 41(3.67) | 0.34544 | 0.5 |
| CTR | | 3014(83.03) | 616(16.97) | | 1251(68.93) | 512(28.21) | 52(2.87) | | 0.965 |
| | rs2109182 | C | T | | CC | CT | TT | | |
| SCZ | 53,549,697 | 1902(85.14) | 332(14.86) | 0.171072 | 808(72.34) | 286(25.6) | 23(2.06) | 0.364963 | 0.693 |
| CTR | | 3137(86.42) | 493(13.58) | | 1356(74.71) | 425(23.42) | 34(1.87) | | 0.917 |
| | rs2359453 | G | A | | GG | GA | AA | | |
| SCZ | 53,558,837 | 1177(52.69) | 1057(47.31) | 0.254219 | 308(27.57) | 561(50.22) | 248(22.2) | 0.517762 | 0.805 |
| CTR | | 1968(54.21) | 1662(45.79) | | 532(29.31) | 904(49.81) | 379(20.88) | | 0.889 |
| | rs11715993 | T | C | | TT | TC | CC | | |
| SCZ | 53,565,945 | 1700(76.1) | 534(23.9) | 0.594052 | 649(58.1) | 402(35.99) | 66(5.91) | 0.860411 | 0.72 |
| CTR | | 2740(75.48) | 890(24.52) | | 1036(57.08) | 668(36.8) | 111(6.12) | | 0.81 |
| | rs17053186 | C | T | | CC | CT | TT | | |
| SCZ | 53,566,110 | 1918(85.85) | 316(14.15) | 0.50414 | 825(73.86) | 268(23.99) | 24(2.15) | 0.798605 | 0.684 |
| CTR | | 3139(86.47) | 491(13.53) | | 1359(74.88) | 421(23.2) | 35(1.93) | | 0.719 |
| | rs709318 | C | T | | CC | CT | TT | | |
| SCZ | 53,575,794 | 2034(91.05) | 200(8.95) | 0.343173 | 929(83.17) | 176(15.76) | 12(1.07) | 0.595115 | 0.263 |
| CTR | | 3278(90.3) | 352(9.7) | | 1483(81.71) | 312(17.19) | 20(1.1) | | 0.432 |
| | rs807193 | A | G | | AA | AG | GG | | |
| SCZ | 53,582,311 | 1430(64.01) | 804(35.99) | 0.340935 | 457(40.91) | 516(46.2) | 144(12.89) | 0.63164 | 0.93 |
| CTR | | 2368(65.23) | 1262(34.77) | | 770(42.42) | 828(45.62) | 217(11.96) | | 0.806 |
| | rs17053233 | T | C | | TT | TC | CC | | |
| SCZ | 53,590,523 | 1764(78.96) | 470(21.04) | 0.337886 | 699(62.58) | 366(32.77) | 52(4.66) | 0.554554 | 0.645 |
| CTR | | 2904(80) | 726(20) | | 1160(63.91) | 584(32.18) | 71(3.91) | | 0.814 |
| | rs6445588 | C | T | | CC | CT | TT | | |
| SCZ | 53,596,652 | 1587(71.04) | 647(28.96) | 0.251673 | 559(50.04) | 469(41.99) | 89(7.97) | 0.510536 | 0.495 |
| CTR | | 2629(72.42) | 1001(27.58) | | 946(52.12) | 737(40.61) | 132(7.27) | | 0.479 |
| | rs9866078 | G | A | | GG | GA | AA | | |
| SCZ | 53,601,415 | 1262(56.49) | 972(43.51) | 0.778689 | 354(31.69) | 554(49.6) | 209(18.71) | 0.894498 | 0.765 |
| CTR | | 2037(56.12) | 1593(43.88) | | 574(31.63) | 889(48.98) | 352(19.39) | | 0.814 |
| | rs3774473 | G | A | | GG | GA | AA | | |
| SCZ | 53,604,824 | 1804(80.75) | 430(19.25) | 0.681676 | 731(65.44) | 342(30.62) | 44(3.94) | 0.662441 | 0.614 |
| CTR | | 2947(81.18) | 683(18.82) | | 1192(65.67) | 563(31.02) | 60(3.31) | | 0.513 |
| | rs13063116 | A | G | | AA | AG | GG | | |
| SCZ | 53,615,650 | 1841(82.41) | 393(17.59) | 0.504351 | 762(68.22) | 317(28.38) | 38(3.4) | 0.649218 | 0.479 |

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|-----|------------|-------------|-------------|----------|-------------|------------|------------|----------|-------|
| CTR | | 3016(83.09) | 614(16.91) | | 1252(68.98) | 512(28.21) | 51(2.81) | | 0.877 |
| | rs898413 | A | G | | AA | AG | GG | | |
| SCZ | 53,617,389 | 1931(86.44) | 303(13.56) | 0.382238 | 838(75.02) | 255(22.83) | 24(2.15) | 0.373273 | 0.378 |
| CTR | | 3108(85.62) | 522(14.38) | | 1327(73.11) | 454(25.01) | 34(1.87) | | 0.501 |
| | rs3796345 | C | T | | CC | CT | TT | | |
| SCZ | 53,619,125 | 1561(69.87) | 673(30.13) | 0.284616 | 547(48.97) | 467(41.81) | 103(9.22) | 0.537793 | 0.817 |
| CTR | | 2584(71.18) | 1046(28.82) | | 918(50.58) | 748(41.21) | 149(8.21) | | 0.845 |
| | rs3774480 | C | T | | CC | CT | TT | | |
| SCZ | 53,620,866 | 1633(73.1) | 601(26.9) | 0.809772 | 591(52.91) | 451(40.38) | 75(6.71) | 0.955272 | 0.374 |
| CTR | | 2643(72.81) | 987(27.19) | | 955(52.62) | 733(40.39) | 127(7) | | 0.394 |
| | rs12493744 | T | C | | TT | TC | CC | | |
| SCZ | 53,626,003 | 1207(54.03) | 1027(45.97) | 0.305686 | 322(28.83) | 563(50.4) | 232(20.77) | 0.549464 | 0.625 |
| CTR | | 2011(55.4) | 1619(44.6) | | 557(30.69) | 897(49.42) | 361(19.89) | | 0.997 |
| | rs3774491 | C | G | | CC | CG | GG | | |
| SCZ | 53,629,808 | 1628(72.87) | 606(27.13) | 0.290209 | 596(53.36) | 436(39.03) | 85(7.61) | 0.54837 | 0.671 |
| CTR | | 2599(71.6) | 1031(28.4) | | 931(51.29) | 737(40.61) | 147(8.1) | | 0.946 |
| | rs6802110 | G | A | | GG | GA | AA | | |
| SCZ | 53,633,205 | 1972(88.27) | 262(11.73) | 0.133659 | 871(77.98) | 230(20.59) | 16(1.43) | 0.326868 | 0.854 |
| CTR | | 3250(89.53) | 380(10.47) | | 1456(80.22) | 338(18.62) | 21(1.16) | | 0.781 |
| | rs1380606 | C | T | | CC | CT | TT | | |
| SCZ | 53,634,105 | 1820(81.47) | 414(18.53) | 0.47597 | 737(65.98) | 346(30.98) | 34(3.04) | 0.69388 | 0.387 |
| CTR | | 2930(80.72) | 700(19.28) | | 1180(65.01) | 570(31.4) | 65(3.58) | | 0.707 |
| | rs6786135 | T | C | | TT | TC | CC | | |
| SCZ | 53,635,938 | 1609(72.02) | 625(27.98) | 0.303705 | 581(52.01) | 447(40.02) | 89(7.97) | 0.579152 | 0.815 |
| CTR | | 2569(70.77) | 1061(29.23) | | 909(50.08) | 751(41.38) | 155(8.54) | | 0.995 |
| | rs2077167 | C | T | | CC | CT | TT | | |
| SCZ | 53,637,392 | 1273(56.98) | 961(43.02) | 0.389335 | 355(31.78) | 563(50.4) | 199(17.82) | 0.3362 | 0.347 |
| CTR | | 2110(58.13) | 1520(41.87) | | 621(34.21) | 868(47.82) | 326(17.96) | | 0.454 |
| | rs6803827 | G | A | | GG | GA | AA | | |
| SCZ | 53,642,306 | 1503(67.28) | 731(32.72) | 0.59832 | 508(45.48) | 487(43.6) | 122(10.92) | 0.868129 | 0.744 |
| CTR | | 2418(66.61) | 1212(33.39) | | 808(44.52) | 802(44.19) | 205(11.29) | | 0.778 |
| | rs2276836 | C | T | | CC | CT | TT | | |
| SCZ | 53,651,012 | 1161(51.97) | 1073(48.03) | 0.350473 | 298(26.68) | 565(50.58) | 254(22.74) | 0.609964 | 0.659 |
| CTR | | 1932(53.22) | 1698(46.78) | | 514(28.32) | 904(49.81) | 397(21.87) | | 0.99 |
| | rs3774519 | T | G | | TT | TG | GG | | |
| SCZ | 53,661,215 | 1955(87.51) | 279(12.49) | 0.354773 | 857(76.72) | 241(21.58) | 19(1.7) | 0.624568 | 0.666 |
| CTR | | 3206(88.32) | 424(11.68) | | 1416(78.02) | 374(20.61) | 25(1.38) | | 0.957 |
| | rs3774523 | T | C | | TT | TC | CC | | |
| SCZ | 53,666,733 | 1798(80.48) | 436(19.52) | 0.707417 | 727(65.09) | 344(30.8) | 46(4.12) | 0.710416 | 0.511 |
| CTR | | 2936(80.88) | 694(19.12) | | 1185(65.29) | 566(31.18) | 64(3.53) | | 0.722 |
| | rs2633707 | C | G | | CC | CG | GG | | |
| SCZ | 53,675,055 | 1719(76.95) | 515(23.05) | 0.287939 | 665(59.53) | 389(34.83) | 63(5.64) | 0.554793 | 0.539 |

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|-----|------------|-------------|-------------|----------|-------------|------------|------------|----------|-------|
| CTR | | 2749(75.73) | 881(24.27) | | 1044(57.52) | 661(36.42) | 110(6.06) | | 0.693 |
| | rs12492502 | A | G | | AA | AG | GG | | |
| SCZ | 53,681,047 | 1250(55.95) | 984(44.05) | 0.91604 | 347(31.07) | 556(49.78) | 214(19.16) | 0.864254 | 0.742 |
| CTR | | 2026(55.81) | 1604(44.19) | | 570(31.4) | 886(48.82) | 359(19.78) | | 0.66 |
| | rs898411 | T | C | | TT | TC | CC | | |
| SCZ | 53,682,885 | 1580(70.73) | 654(29.27) | 0.269071 | 562(50.31) | 456(40.82) | 99(8.86) | 0.546428 | 0.636 |
| CTR | | 2616(72.07) | 1014(27.93) | | 947(52.18) | 722(39.78) | 146(8.04) | | 0.61 |
| | rs11130377 | T | C | | TT | TC | CC | | |
| SCZ | 53,688,847 | 1347(60.3) | 887(39.7) | 0.822481 | 403(36.08) | 541(48.43) | 173(15.49) | 0.970151 | 0.699 |
| CTR | | 2178(60) | 1452(40) | | 650(35.81) | 878(48.37) | 287(15.81) | | 0.739 |
| | rs1380608 | A | G | | AA | AG | GG | | |
| SCZ | 53,690,343 | 1925(86.17) | 309(13.83) | 0.212745 | 834(74.66) | 257(23.01) | 26(2.33) | 0.279825 | 0.245 |
| CTR | | 3085(84.99) | 545(15.01) | | 1310(72.18) | 465(25.62) | 40(2.2) | | 0.867 |
| | rs9841978 | G | A | | GG | GA | AA | | |
| SCZ | 53,696,708 | 1582(70.81) | 652(29.19) | 0.796408 | 554(49.6) | 474(42.44) | 89(7.97) | 0.802103 | 0.374 |
| CTR | | 2582(71.13) | 1048(28.87) | | 917(50.52) | 748(41.21) | 150(8.26) | | 0.884 |
| | rs7340705 | T | C | | TT | TC | CC | | |
| SCZ | 53,700,416 | 1215(54.39) | 1019(45.61) | 0.325205 | 324(29.01) | 567(50.76) | 226(20.23) | 0.574107 | 0.44 |
| CTR | | 2022(55.7) | 1608(44.3) | | 559(30.8) | 904(49.81) | 352(19.39) | | 0.693 |
| | rs6445597 | G | A | | GG | GA | AA | | |
| SCZ | 53,700,504 | 1386(62.04) | 848(37.96) | 0.847872 | 435(38.94) | 516(46.2) | 166(14.86) | 0.912998 | 0.521 |
| CTR | | 2243(61.79) | 1387(38.21) | | 695(38.29) | 853(47) | 267(14.71) | | 0.841 |
| | rs9830632 | A | G | | AA | AG | GG | | |
| SCZ | 53,701,739 | 1877(84.02) | 357(15.98) | 0.305352 | 792(70.9) | 293(26.23) | 32(2.86) | 0.594443 | 0.439 |
| CTR | | 3086(85.01) | 544(14.99) | | 1316(72.51) | 454(25.01) | 45(2.48) | | 0.435 |
| | rs3774529 | G | T | | GG | GT | TT | | |
| SCZ | 53,703,134 | 1898(84.96) | 336(15.04) | 0.380538 | 805(72.07) | 288(25.78) | 24(2.15) | 0.640292 | 0.767 |
| CTR | | 3053(84.1) | 577(15.9) | | 1285(70.8) | 483(26.61) | 47(2.59) | | 0.841 |
| | rs3774533 | A | G | | AA | AG | GG | | |
| SCZ | 53,704,293 | 1427(63.88) | 807(36.12) | 0.388287 | 451(40.38) | 525(47) | 141(12.62) | 0.683596 | 0.537 |
| CTR | | 2359(64.99) | 1271(35.01) | | 760(41.87) | 839(46.23) | 216(11.9) | | 0.502 |
| | rs2633731 | C | T | | CC | CT | TT | | |
| SCZ | 53,704,397 | 1798(80.48) | 436(19.52) | 0.277249 | 726(65) | 346(30.98) | 45(4.03) | 0.51404 | 0.64 |
| CTR | | 2963(81.63) | 667(18.37) | | 1209(66.61) | 545(30.03) | 61(3.36) | | 0.965 |
| | rs3821857 | T | C | | TT | TC | CC | | |
| SCZ | 53,704,433 | 1823(81.6) | 411(18.4) | 0.394574 | 746(66.79) | 331(29.63) | 40(3.58) | 0.638917 | 0.662 |
| CTR | | 2994(82.48) | 636(17.52) | | 1234(67.99) | 526(28.98) | 55(3.03) | | 0.907 |
| | rs2633730 | C | T | | CC | CT | TT | | |
| SCZ | 53,706,672 | 1183(52.95) | 1051(47.05) | 0.30662 | 308(27.57) | 567(50.76) | 242(21.67) | 0.567338 | 0.53 |
| CTR | | 1972(54.33) | 1658(45.67) | | 532(29.31) | 908(50.03) | 375(20.66) | | 0.73 |
| | rs2633728 | C | G | | CC | CG | GG | | |
| SCZ | 53,706,912 | 1854(82.99) | 380(17.01) | 0.325993 | 774(69.29) | 306(27.39) | 37(3.31) | 0.596633 | 0.321 |

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|-----|------------|-------------|-------------|----------|-------------|------------|------------|----------|-------|
| CTR | | 2976(81.98) | 654(18.02) | | 1225(67.49) | 526(28.98) | 64(3.53) | | 0.419 |
| | rs3774541 | G | A | | GG | GA | AA | | |
| SCZ | 53,707,105 | 1608(71.98) | 626(28.02) | 0.229332 | 574(51.39) | 460(41.18) | 83(7.43) | 0.474874 | 0.485 |
| CTR | | 2665(73.42) | 965(26.58) | | 973(53.61) | 719(39.61) | 123(6.78) | | 0.526 |
| | rs2680661 | T | G | | TT | TG | GG | | |
| SCZ | 53,708,121 | 1227(54.92) | 1007(45.08) | 0.430219 | 333(29.81) | 561(50.22) | 223(19.96) | 0.714309 | 0.632 |
| CTR | | 2032(55.98) | 1598(44.02) | | 566(31.18) | 900(49.59) | 349(19.23) | | 0.794 |
| | rs2612015 | T | G | | TT | TG | GG | | |
| SCZ | 53,708,304 | 2011(90.02) | 223(9.98) | 0.794922 | 904(80.93) | 203(18.17) | 10(0.9) | 0.86389 | 0.707 |
| CTR | | 3260(89.81) | 370(10.19) | | 1465(80.72) | 330(18.18) | 20(1.1) | | 0.769 |
| | rs6445598 | A | T | | AA | AT | TT | | |
| SCZ | 53,708,709 | 1763(78.92) | 471(21.08) | 0.190476 | 694(62.13) | 375(33.57) | 48(4.3) | 0.414344 | 0.767 |
| CTR | | 2916(80.33) | 714(19.67) | | 1171(64.52) | 574(31.63) | 70(3.86) | | 0.974 |
| | rs3821858 | T | C | | TT | TC | CC | | |
| SCZ | 53,713,653 | 1950(87.29) | 284(12.71) | 0.125022 | 850(76.1) | 250(22.38) | 17(1.52) | 0.303802 | 0.777 |
| CTR | | 3217(88.62) | 413(11.38) | | 1425(78.51) | 367(20.22) | 23(1.27) | | 0.908 |
| | rs2070617 | G | A | | GG | GA | AA | | |
| SCZ | 53,724,022 | 1329(59.49) | 905(40.51) | 0.498884 | 391(35) | 547(48.97) | 179(16.03) | 0.781694 | 0.593 |
| CTR | | 2127(58.6) | 1503(41.4) | | 619(34.1) | 889(48.98) | 307(16.91) | | 0.687 |
| | rs7638857 | C | A | | CC | CA | AA | | |
| SCZ | 53,724,296 | 1592(71.26) | 642(28.74) | 0.233121 | 565(50.58) | 462(41.36) | 90(8.06) | 0.467973 | 0.743 |
| CTR | | 2639(72.7) | 991(27.3) | | 960(52.89) | 719(39.61) | 136(7.49) | | 0.931 |
| | rs17053417 | G | A | | GG | GA | AA | | |
| SCZ | 53,725,362 | 1971(88.23) | 263(11.77) | 0.404589 | 868(77.71) | 235(21.04) | 14(1.25) | 0.647895 | 0.67 |
| CTR | | 3176(87.49) | 454(12.51) | | 1390(76.58) | 396(21.82) | 29(1.6) | | 0.896 |
| | rs1020819 | C | A | | CC | CA | AA | | |
| SCZ | 53,728,686 | 1595(71.4) | 639(28.6) | 0.283622 | 574(51.39) | 447(40.02) | 96(8.59) | 0.440466 | 0.499 |
| CTR | | 2544(70.08) | 1086(29.92) | | 889(48.98) | 766(42.2) | 160(8.82) | | 0.784 |
| | rs17030975 | C | T | | CC | CT | TT | | |
| SCZ | 53,734,178 | 1394(62.4) | 840(37.6) | 0.539915 | 441(39.48) | 512(45.84) | 164(14.68) | 0.665986 | 0.438 |
| CTR | | 2294(63.2) | 1336(36.8) | | 724(39.89) | 846(46.61) | 245(13.5) | | 0.931 |
| | rs1045958 | C | T | | CC | CT | TT | | |
| SCZ | 53,735,452 | 1614(72.25) | 620(27.75) | 0.135542 | 588(52.64) | 438(39.21) | 91(8.15) | 0.258517 | 0.459 |
| CTR | | 2687(74.02) | 943(25.98) | | 993(54.71) | 701(38.62) | 121(6.67) | | 0.856 |
| | rs11915963 | T | C | | TT | TC | CC | | |
| SCZ | 53,737,887 | 1997(89.39) | 237(10.61) | 0.455105 | 890(79.68) | 217(19.43) | 10(0.9) | 0.34406 | 0.417 |
| CTR | | 3267(90) | 363(10) | | 1474(81.21) | 319(17.58) | 22(1.21) | | 0.315 |
| | rs2612027 | A | G | | AA | AG | GG | | |
| SCZ | 53,742,651 | 1206(53.98) | 1028(46.02) | 0.14714 | 317(28.38) | 572(51.21) | 228(20.41) | 0.199044 | 0.305 |
| CTR | | 2030(55.92) | 1600(44.08) | | 572(31.52) | 886(48.82) | 357(19.67) | | 0.676 |
| | rs2680648 | T | C | | TT | TC | CC | | |
| SCZ | 53,743,149 | 1669(74.71) | 565(25.29) | 0.440916 | 619(55.42) | 431(38.59) | 67(6) | 0.624231 | 0.481 |

| | | | | | | | | | |
|-----|------------|-------------|-------------|----------|-------------|------------|------------|----------|-------|
| CTR | | 2679(73.8) | 951(26.2) | | 989(54.49) | 701(38.62) | 125(6.89) | | 0.959 |
| | rs2253795 | G | T | | GG | GT | TT | | |
| SCZ | 53,744,848 | 1888(84.51) | 346(15.49) | 0.115448 | 801(71.71) | 286(25.6) | 30(2.69) | 0.285943 | 0.464 |
| CTR | | 3122(86.01) | 508(13.99) | | 1345(74.1) | 432(23.8) | 38(2.09) | | 0.632 |
| | rs17053459 | A | G | | AA | AG | GG | | |
| SCZ | 53,746,967 | 2037(91.18) | 197(8.82) | 0.173832 | 929(83.17) | 179(16.03) | 9(0.81) | 0.396657 | 0.907 |
| CTR | | 3271(90.11) | 359(9.89) | | 1474(81.21) | 323(17.8) | 18(0.99) | | 0.948 |
| | rs3774560 | T | C | | TT | TC | CC | | |
| SCZ | 53,751,376 | 2000(89.53) | 234(10.47) | 0.174597 | 897(80.3) | 206(18.44) | 14(1.25) | 0.389449 | 0.578 |
| CTR | | 3208(88.37) | 422(11.63) | | 1419(78.18) | 370(20.39) | 26(1.43) | | 0.737 |
| | rs17053472 | A | C | | AA | AC | CC | | |
| SCZ | 53,754,705 | 2036(91.14) | 198(8.86) | 0.287497 | 930(83.26) | 176(15.76) | 11(0.98) | 0.506773 | 0.41 |
| CTR | | 3278(90.3) | 352(9.7) | | 1481(81.6) | 316(17.41) | 18(0.99) | | 0.802 |
| | rs3774563 | A | G | | AA | AG | GG | | |
| SCZ | 53,756,249 | 1852(82.9) | 382(17.1) | 0.367205 | 773(69.2) | 306(27.39) | 38(3.4) | 0.594272 | 0.26 |
| CTR | | 3042(83.8) | 588(16.2) | | 1278(70.41) | 486(26.78) | 51(2.81) | | 0.559 |
| | rs3796347 | G | A | | GG | GA | AA | | |
| SCZ | 53,758,863 | 1807(80.89) | 427(19.11) | 0.152984 | 729(65.26) | 349(31.24) | 39(3.49) | 0.340651 | 0.726 |
| CTR | | 2990(82.37) | 640(17.63) | | 1232(67.88) | 526(28.98) | 57(3.14) | | 0.925 |
| | rs3774573 | T | C | | TT | TC | CC | | |
| SCZ | 53,765,933 | 1853(82.95) | 381(17.05) | 0.348147 | 771(69.02) | 311(27.84) | 35(3.13) | 0.642204 | 0.595 |
| CTR | | 2976(81.98) | 654(18.02) | | 1223(67.38) | 530(29.2) | 62(3.42) | | 0.624 |
| | rs1109959 | T | C | | TT | TC | CC | | |
| SCZ | 53,766,195 | 1884(84.33) | 350(15.67) | 0.120806 | 798(71.44) | 288(25.78) | 31(2.78) | 0.277038 | 0.417 |
| CTR | | 3115(85.81) | 515(14.19) | | 1338(73.72) | 439(24.19) | 38(2.09) | | 0.777 |
| | rs3821865 | T | C | | TT | TC | CC | | |
| SCZ | 53,768,268 | 1446(64.73) | 788(35.27) | 0.569776 | 475(42.52) | 496(44.4) | 146(13.07) | 0.615609 | 0.357 |
| CTR | | 2323(63.99) | 1307(36.01) | | 742(40.88) | 839(46.23) | 234(12.89) | | 0.895 |
| | rs3774581 | A | G | | AA | AG | GG | | |
| SCZ | 53,768,721 | 1331(59.58) | 903(40.42) | 0.184596 | 394(35.27) | 543(48.61) | 180(16.11) | 0.408563 | 0.756 |
| CTR | | 2226(61.32) | 1404(38.68) | | 681(37.52) | 864(47.6) | 270(14.88) | | 0.881 |
| | rs7617553 | G | A | | GG | GA | AA | | |
| SCZ | 53,779,205 | 1453(65.04) | 781(34.96) | 0.411795 | 474(42.44) | 505(45.21) | 138(12.35) | 0.707901 | 0.845 |
| CTR | | 2399(66.09) | 1231(33.91) | | 793(43.69) | 813(44.79) | 209(11.52) | | 0.977 |
| | rs11707420 | G | A | | GG | GA | AA | | |
| SCZ | 53,781,838 | 1653(73.99) | 581(26.01) | 0.248435 | 613(54.88) | 427(38.23) | 77(6.89) | 0.505318 | 0.822 |
| CTR | | 2636(72.62) | 994(27.38) | | 957(52.73) | 722(39.78) | 136(7.49) | | 0.991 |
| | rs3774589 | G | T | | GG | GT | TT | | |
| SCZ | 53,783,331 | 1485(66.47) | 749(33.53) | 0.503362 | 489(43.78) | 507(45.39) | 121(10.83) | 0.757562 | 0.54 |
| CTR | | 2382(65.62) | 1248(34.38) | | 779(42.92) | 824(45.4) | 212(11.68) | | 0.792 |
| | rs3774604 | C | T | | CC | CT | TT | | |
| SCZ | 53,790,109 | 1788(80.04) | 446(19.96) | 0.357732 | 712(63.74) | 364(32.59) | 41(3.67) | 0.588168 | 0.51 |

| | | | | | | | | | |
|-----|------------|-------------|-------------|----------|-------------|------------|------------|----------|-------|
| CTR | | 2869(79.04) | 761(20.96) | | 1133(62.42) | 603(33.22) | 79(4.35) | | 0.913 |
| | rs3774609 | T | G | | TT | TG | GG | | |
| SCZ | 53,798,876 | 1386(62.04) | 848(37.96) | 0.299791 | 427(38.23) | 532(47.63) | 158(14.15) | 0.509647 | 0.708 |
| CTR | | 2301(63.39) | 1329(36.61) | | 733(40.39) | 835(46.01) | 247(13.61) | | 0.707 |
| | rs3796349 | A | G | | AA | AG | GG | | |
| SCZ | 53,799,482 | 1723(77.13) | 511(22.87) | 0.285156 | 667(59.71) | 389(34.83) | 61(5.46) | 0.528885 | 0.664 |
| CTR | | 2843(78.32) | 787(21.68) | | 1113(61.32) | 617(33.99) | 85(4.68) | | 0.966 |
| | rs2359133 | C | G | | CC | CG | GG | | |
| SCZ | 53,802,715 | 1654(74.04) | 580(25.96) | 0.347325 | 609(54.52) | 436(39.03) | 72(6.45) | 0.575839 | 0.608 |
| CTR | | 2647(72.92) | 983(27.08) | | 966(53.22) | 715(39.39) | 134(7.38) | | 0.915 |
| | rs3774611 | G | A | | GG | GA | AA | | |
| SCZ | 53,806,638 | 1183(52.95) | 1051(47.05) | 0.124304 | 308(27.57) | 567(50.76) | 242(21.67) | 0.249082 | 0.53 |
| CTR | | 1997(55.01) | 1633(44.99) | | 552(30.41) | 893(49.2) | 370(20.39) | | 0.799 |
| | rs10154841 | C | T | | CC | CT | TT | | |
| SCZ | 53,811,268 | 1826(81.74) | 408(18.26) | 0.152133 | 743(66.52) | 340(30.44) | 34(3.04) | 0.317411 | 0.514 |
| CTR | | 3020(83.2) | 610(16.8) | | 1256(69.2) | 508(27.99) | 51(2.81) | | 0.966 |
| | rs10490844 | A | G | | AA | AG | GG | | |
| SCZ | 53,812,050 | 1878(84.06) | 356(15.94) | 0.122258 | 787(70.46) | 304(27.22) | 26(2.33) | 0.247641 | 0.597 |
| CTR | | 2995(82.51) | 635(17.49) | | 1238(68.21) | 519(28.6) | 58(3.2) | | 0.689 |
| | rs877483 | C | T | | CC | CT | TT | | |
| SCZ | 53,812,714 | 1962(87.82) | 272(12.18) | 0.178846 | 865(77.44) | 232(20.77) | 20(1.79) | 0.20131 | 0.336 |
| CTR | | 3144(86.61) | 486(13.39) | | 1358(74.82) | 428(23.58) | 29(1.6) | | 0.474 |
| | rs877484 | G | A | | GG | GA | AA | | |
| SCZ | 53,812,897 | 1734(77.62) | 500(22.38) | 0.217942 | 675(60.43) | 384(34.38) | 58(5.19) | 0.467788 | 0.724 |
| CTR | | 2867(78.98) | 763(21.02) | | 1134(62.48) | 599(33) | 82(4.52) | | 0.798 |

SCZ: schizophrenia; CTR: control

1. p-values of the normal chi-square statistics from Monte Carlo stimulation using CLUMP (T2).

TableS2 Gender specific allele and genotype association analysis in the testing and validation datasets

| Markers | | The testing dataset | | | | | | | | The validation dataset | | | | | | | |
|-----------|------------------|---------------------|----------------------|--------------------|------------|------------|----------------------|--------------|------------------|------------------------|----------------------|--------------------|-------------|-------------|----------------------|--------------|-------|
| SNP ID | Allele Freq. (%) | | p-value ¹ | Genotype Freq. (%) | | | p-value ¹ | H-WE p-value | Allele Freq. (%) | | p-value ¹ | Genotype Freq. (%) | | | p-value ¹ | H-WE p-value | |
| rs709323 | T | G | | TT | GT | GG | | | T | G | | TT | GT | GG | | | |
| F | SCZ | 865(74.44) | 297(25.56) | 0.338366 | 325(55.94) | 215(37.01) | 41(7.06) | 0.417513 | 0.507 | 1014(76.13) | 318(23.87) | 0.118812 | 386(57.96) | 242(36.34) | 38(5.71) | 0.435644 | 0.993 |
| | CTR | 1327(76) | 419(24) | | 501(57.39) | 325(37.23) | 47(5.38) | | 0.543 | 3139(77.89) | 891(22.11) | | 1221(60.6) | 697(34.59) | 97(4.81) | | 0.847 |
| M | SCZ | 791(73.79) | 281(26.21) | 0.115449 | 295(55.04) | 201(37.5) | 40(7.46) | 0.177906 | 0.479 | 1208(79.06) | 320(20.94) | 0.643564 | 482(63.09) | 244(31.94) | 38(4.97) | 0.673267 | 0.326 |
| | CTR | 1439(76.38) | 445(23.62) | | 546(57.96) | 347(36.84) | 49(5.2) | | 0.521 | 3630(79.61) | 930(20.39) | | 1446(63.42) | 738(32.37) | 96(4.21) | | 0.881 |
| rs3774458 | G | A | | GG | GA | AA | | | G | A | | GG | GA | AA | | | |
| F | SCZ | 921(79.26) | 241(20.74) | 0.193250 | 368(63.34) | 185(31.84) | 28(4.82) | 0.260661 | 0.448 | 1099(82.51) | 233(17.49) | 0.128713 | 455(68.32) | 189(28.38) | 22(3.3) | 0.386139 | 0.663 |
| | CTR | 1418(81.21) | 328(18.79) | | 573(65.64) | 272(31.16) | 28(3.21) | | 0.533 | 3390(84.12) | 640(15.88) | | 1425(70.72) | 540(26.8) | 50(2.48) | | 0.891 |
| M | SCZ | 863(80.5) | 209(19.5) | 0.262687 | 351(65.49) | 161(30.04) | 24(4.48) | 0.304203 | 0.318 | 1270(83.12) | 258(16.88) | 0.683168 | 532(69.63) | 206(26.96) | 26(3.4) | 0.623762 | 0.277 |
| | CTR | 1548(82.17) | 336(17.83) | | 634(67.3) | 280(29.72) | 28(2.97) | | 0.663 | 3808(83.51) | 752(16.49) | | 1590(69.74) | 628(27.54) | 62(2.72) | | 0.999 |
| rs1460118 | A | G | | AA | AG | GG | | | A | G | | AA | AG | GG | | | |
| F | SCZ | 836(71.94) | 326(28.06) | 0.184264 | 306(52.67) | 224(38.55) | 51(8.78) | 0.410301 | 0.279 | 964(72.37) | 368(27.63) | 0.316832 | 354(53.15) | 256(38.44) | 56(8.41) | 0.396040 | 0.317 |
| | CTR | 1295(74.17) | 451(25.83) | | 485(55.56) | 325(37.23) | 63(7.22) | | 0.401 | 2970(73.7) | 1060(26.3) | | 1094(54.29) | 782(38.81) | 139(6.9) | | 0.963 |
| M | SCZ | 759(70.8) | 313(29.2) | 0.171790 | 267(49.81) | 225(41.98) | 44(8.21) | 0.387195 | 0.723 | 1098(71.86) | 430(28.14) | 0.722772 | 394(51.57) | 310(40.58) | 60(7.85) | 0.940594 | 0.928 |
| | CTR | 1378(73.14) | 506(26.86) | | 501(53.18) | 376(39.92) | 65(6.9) | | 0.625 | 3300(72.37) | 1260(27.63) | | 1195(52.41) | 910(39.91) | 175(7.68) | | 0.923 |
| rs3774530 | T | C | | TT | TC | CC | | | T | C | | TT | TC | CC | | | |
| F | SCZ | 795(68.42) | 367(31.58) | 0.286259 | 269(46.3) | 257(44.23) | 55(9.47) | 0.492239 | 0.570 | 821(61.64) | 511(38.36) | 0.168317 | 248(37.24) | 325(48.8) | 93(13.96) | 0.326733 | 0.411 |
| | CTR | 1227(70.27) | 519(29.73) | | 432(49.48) | 363(41.58) | 78(8.93) | | 0.889 | 2559(63.5) | 1471(36.5) | | 812(40.3) | 935(46.4) | 268(13.3) | | 0.964 |
| M | SCZ | 746(69.59) | 326(30.41) | 0.178907 | 257(47.95) | 232(43.28) | 47(8.77) | 0.393473 | 0.600 | 976(63.87) | 552(36.13) | 0.306931 | 313(40.97) | 350(45.81) | 101(13.22) | 0.712871 | 0.839 |
| | CTR | 1355(71.92) | 529(28.08) | | 485(51.49) | 385(40.87) | 72(7.64) | | 0.714 | 2972(65.18) | 1588(34.82) | | 970(42.54) | 1032(45.26) | 278(12.19) | | 0.890 |
| rs3774601 | G | A | | GG | GA | AA | | | G | A | | GG | GA | AA | | | |
| F | SCZ | 889(76.51) | 273(23.49) | 0.197225 | 337(58) | 215(37.01) | 29(4.99) | 0.305520 | 0.479 | 1071(80.41) | 261(19.59) | 0.118812 | 429(64.41) | 213(31.98) | 24(3.6) | 0.475248 | 0.699 |
| | CTR | 1299(74.4) | 447(25.6) | | 486(55.67) | 327(37.46) | 60(6.87) | | 0.621 | 3175(78.78) | 855(21.22) | | 1251(62.08) | 673(33.4) | 91(4.52) | | 0.968 |
| M | SCZ | 834(77.8) | 238(22.2) | 0.144664 | 319(59.51) | 196(36.57) | 21(3.92) | 0.148778 | 0.175 | 1252(81.94) | 276(18.06) | 0.297030 | 508(66.49) | 236(30.89) | 20(2.62) | 0.336634 | 0.228 |
| | CTR | 1421(75.42) | 463(24.58) | | 538(57.11) | 345(36.62) | 59(6.26) | | 0.711 | 3680(80.7) | 880(19.3) | | 1485(65.13) | 710(31.14) | 85(3.73) | | 0.991 |
| rs3774605 | C | T | | CC | CT | TT | | | C | T | | CC | CT | TT | | | |
| F | SCZ | 1013(87.18) | 149(12.82) | 0.250920 | 443(76.25) | 127(21.86) | 11(1.89) | 0.522391 | 0.591 | 1214(91.14) | 118(8.86) | 0.207921 | 553(83.03) | 108(16.22) | 5(0.75) | 0.356436 | 0.913 |
| | CTR | 1496(85.68) | 250(14.32) | | 643(73.65) | 210(24.05) | 20(2.29) | | 0.562 | 3627(90) | 403(10) | | 1632(80.99) | 363(18.01) | 20(0.99) | | 0.970 |
| M | SCZ | 919(85.73) | 153(14.27) | 0.245832 | 390(72.76) | 139(25.93) | 7(1.31) | 0.183638 | 0.167 | 1377(90.12) | 151(9.88) | 0.415842 | 624(81.68) | 129(16.88) | 11(1.44) | 0.267327 | 0.151 |
| | CTR | 1585(84.13) | 299(15.87) | | 669(71.02) | 247(26.22) | 26(2.76) | | 0.579 | 4078(89.43) | 482(10.57) | | 1821(79.87) | 436(19.12) | 23(1.01) | | 0.584 |

SCZ: schizophrenia; CTR: control

1. p-values of the normal chi-square statistics from Monte Carlo stimulation using CLUMP (T2).

Table S3. Summary of the association test for imputed and typed SNPs using frequentist method.

| typed | rs ID | chromosome | position | alleleA | alleleB | MAF | p-value |
|-----------|------------|------------|----------|---------|---------|----------|-----------|
| imputed | rs17053026 | 3 | 53393838 | C | T | 0.021803 | 0.965601 |
| imputed | rs7630080 | 3 | 53495180 | A | G | 0.173381 | 0.145435 |
| imputed | rs312480 | 3 | 53504180 | C | T | 0.150914 | 0.0544111 |
| imputed | rs312487 | 3 | 53520662 | C | T | 0.428969 | 0.0260372 |
| imputed | rs979220 | 3 | 53531263 | C | T | 0.277493 | 0.630679 |
| imputed | rs3774430 | 3 | 53541490 | A | G | 0.144803 | 0.772245 |
| imputed | rs9821489 | 3 | 53550768 | A | G | 0.18641 | 0.668399 |
| imputed | rs12715461 | 3 | 53553923 | A | G | 0.364162 | 0.0766316 |
| imputed | rs6445584 | 3 | 53562884 | A | G | 0.052615 | 0.25819 |
| imputed | rs2359453 | 3 | 53567904 | A | G | 0.366846 | 0.0593187 |
| imputed | rs17053186 | 3 | 53575177 | C | T | 0.231268 | 0.538227 |
| imputed | rs17053195 | 3 | 53579995 | A | G | 0.038559 | 0.744416 |
| imputed | rs11707155 | 3 | 53583346 | A | G | 0.017884 | 0.0130713 |
| imputed | rs709317 | 3 | 53584650 | A | G | 0.170271 | 0.310384 |
| imputed | rs709318 | 3 | 53584861 | C | T | 0.037522 | 0.522151 |
| imputed | rs17053206 | 3 | 53584940 | C | T | 0.037584 | 0.729103 |
| genotyped | rs709323 | 3 | 53589524 | A | C | 0.21476 | 0.212286 |
| imputed | rs807198 | 3 | 53590498 | A | T | 0.389382 | 0.201553 |
| imputed | rs807197 | 3 | 53590738 | C | T | 0.183199 | 0.166577 |
| imputed | rs807194 | 3 | 53591110 | A | C | 0.285451 | 0.147553 |
| imputed | rs807193 | 3 | 53591378 | A | G | 0.255971 | 0.115306 |
| imputed | rs807192 | 3 | 53591641 | C | G | 0.034697 | 0.469035 |
| genotyped | rs3774458 | 3 | 53592908 | A | G | 0.164454 | 0.230389 |
| imputed | rs3774463 | 3 | 53598142 | C | T | 0.095695 | 0.472525 |
| imputed | rs6445588 | 3 | 53605719 | C | T | 0.339507 | 0.527596 |
| imputed | rs936450 | 3 | 53609466 | A | G | 0.496221 | 0.162494 |
| imputed | rs9866078 | 3 | 53610482 | A | G | 0.462212 | 0.212784 |
| imputed | rs9810888 | 3 | 53610635 | G | T | 0.457997 | 0.357922 |
| imputed | rs7610071 | 3 | 53612735 | C | T | 0.333987 | 0.253543 |
| imputed | rs17309406 | 3 | 53613751 | G | T | 0.064286 | 0.103387 |
| imputed | rs3774473 | 3 | 53613891 | A | G | 0.161939 | 0.624262 |
| imputed | rs11721212 | 3 | 53614979 | C | T | 0.042744 | 0.0380448 |
| imputed | rs11918955 | 3 | 53616124 | A | G | 0.15867 | 0.799889 |
| imputed | rs17053265 | 3 | 53621579 | A | G | 0.056947 | 0.535329 |
| imputed | rs1460115 | 3 | 53622852 | C | T | 0.216633 | 0.349847 |
| imputed | rs6794085 | 3 | 53624648 | A | G | 0.182652 | 0.122593 |
| imputed | rs13063116 | 3 | 53624717 | A | G | 0.1259 | 0.531759 |
| imputed | rs3796345 | 3 | 53628192 | C | T | 0.308859 | 0.069198 |
| imputed | rs3774480 | 3 | 53629933 | C | T | 0.24098 | 0.333563 |
| imputed | rs9850569 | 3 | 53631844 | A | G | 0.444539 | 0.106372 |
| imputed | rs17053279 | 3 | 53634757 | A | G | 0.049128 | 0.495075 |
| imputed | rs12493744 | 3 | 53635070 | C | T | 0.379856 | 0.999223 |

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|-----------|------------|---|----------|---|---|----------|-------------|
| imputed | rs3774487 | 3 | 53637234 | A | G | 0.16333 | 0.478643 |
| imputed | rs3821854 | 3 | 53638332 | C | T | 0.460129 | 0.19373 |
| imputed | rs3774490 | 3 | 53638688 | C | T | 0.130673 | 0.312897 |
| imputed | rs3774491 | 3 | 53638875 | C | G | 0.30284 | 0.602494 |
| imputed | rs6802110 | 3 | 53642272 | A | G | 0.06092 | 0.0191367 |
| imputed | rs898415 | 3 | 53642679 | A | G | 0.233256 | 0.231991 |
| imputed | rs1380606 | 3 | 53643172 | C | T | 0.232981 | 0.228397 |
| imputed | rs11707976 | 3 | 53643748 | A | G | 0.091172 | 0.12223 |
| imputed | rs11709171 | 3 | 53644944 | A | C | 0.032384 | 0.0133293 |
| imputed | rs6786135 | 3 | 53645005 | C | T | 0.30216 | 0.572377 |
| imputed | rs2077167 | 3 | 53646459 | C | T | 0.442368 | 0.137004 |
| imputed | rs6763245 | 3 | 53650755 | A | G | 0.369521 | 0.0305456 |
| imputed | rs6803827 | 3 | 53651373 | A | G | 0.491905 | 0.107498 |
| imputed | rs3774503 | 3 | 53652225 | A | G | 0.127859 | 0.541786 |
| imputed | rs1037827 | 3 | 53658352 | A | G | 0.442722 | 0.47058 |
| imputed | rs2276836 | 3 | 53660079 | C | T | 0.379868 | 0.024254 |
| imputed | rs11712998 | 3 | 53663998 | A | G | 0.088699 | 0.113746 |
| imputed | rs3774519 | 3 | 53670282 | G | T | 0.072519 | 0.0197056 |
| imputed | rs9881913 | 3 | 53671328 | A | G | 0.027275 | 0.648157 |
| imputed | rs2250736 | 3 | 53675590 | C | T | 0.283242 | 0.377957 |
| imputed | rs3821856 | 3 | 53675744 | A | G | 0.071161 | 0.184858 |
| imputed | rs3774523 | 3 | 53675800 | C | T | 0.052977 | 0.436216 |
| imputed | rs3774527 | 3 | 53680043 | C | T | 0.018084 | 0.852718 |
| imputed | rs11130376 | 3 | 53680390 | C | T | 0.025625 | 0.0597129 |
| imputed | rs2633707 | 3 | 53684122 | C | G | 0.288959 | 0.116806 |
| genotyped | rs1460118 | 3 | 53684891 | C | T | 0.272314 | 0.353417 |
| imputed | rs1380609 | 3 | 53689216 | C | T | 0.097898 | 0.204061 |
| imputed | rs12492502 | 3 | 53690114 | A | G | 0.320555 | 0.0739116 |
| imputed | rs2680672 | 3 | 53691013 | C | T | 0.44657 | 0.185455 |
| imputed | rs898411 | 3 | 53691952 | C | T | 0.286279 | 0.330672 |
| imputed | rs898422 | 3 | 53692322 | A | G | 0.190529 | 0.340744 |
| imputed | rs2612018 | 3 | 53694125 | C | T | 0.142946 | 0.47732 |
| imputed | rs11130377 | 3 | 53697914 | C | T | 0.276576 | 0.821881 |
| imputed | rs1380608 | 3 | 53699410 | A | G | 0.10837 | 0.999516 |
| imputed | rs898417 | 3 | 53704431 | C | T | 0.05879 | 0.365498 |
| imputed | rs9841978 | 3 | 53705775 | A | G | 0.28915 | 0.618174 |
| imputed | rs7340705 | 3 | 53709483 | C | T | 0.404019 | 0.958748 |
| imputed | rs6445597 | 3 | 53709571 | A | G | 0.293921 | 0.496198 |
| imputed | rs9830632 | 3 | 53710806 | A | G | 0.269586 | 0.549856 |
| imputed | rs17053363 | 3 | 53711597 | A | T | 0.075801 | 0.142328 |
| imputed | rs3774529 | 3 | 53712201 | G | T | 0.076296 | 0.000974805 |
| genotyped | rs3774530 | 3 | 53712410 | C | T | 0.36 | 0.132757 |
| imputed | rs3774531 | 3 | 53712615 | C | T | 0.463788 | 0.0534673 |
| imputed | rs3774533 | 3 | 53713360 | A | G | 0.394867 | 0.0329672 |
| imputed | rs2633731 | 3 | 53713464 | C | T | 0.25548 | 0.100647 |

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|---------|------------|---|----------|---|---|----------|------------|
| imputed | rs3821857 | 3 | 53713500 | C | T | 0.092763 | 0.59609 |
| imputed | rs1380605 | 3 | 53713814 | C | T | 0.412203 | 0.0299649 |
| imputed | rs2633730 | 3 | 53715739 | C | T | 0.489768 | 0.0017902 |
| imputed | rs2633728 | 3 | 53715979 | C | G | 0.186695 | 0.126448 |
| imputed | rs3774541 | 3 | 53716172 | A | G | 0.32014 | 0.00714984 |
| imputed | rs2680661 | 3 | 53717188 | G | T | 0.396977 | 0.0117334 |
| imputed | rs2612015 | 3 | 53717371 | G | T | 0.191034 | 0.570121 |
| imputed | rs6445598 | 3 | 53717776 | A | T | 0.136991 | 0.0956017 |
| imputed | rs2633727 | 3 | 53721129 | A | G | 0.041382 | 0.109192 |
| imputed | rs10510765 | 3 | 53721246 | C | G | 0.062964 | 0.0291484 |
| imputed | rs13076366 | 3 | 53722414 | A | C | 0.112568 | 0.0701254 |
| imputed | rs11708227 | 3 | 53723073 | C | T | 0.113247 | 0.0712147 |
| imputed | rs11709505 | 3 | 53724538 | C | T | 0.113298 | 0.0729244 |
| imputed | rs2633725 | 3 | 53726782 | C | T | 0.051185 | 0.120158 |
| imputed | rs2070617 | 3 | 53733089 | A | G | 0.339687 | 0.533793 |
| imputed | rs7638857 | 3 | 53733363 | A | C | 0.449064 | 0.427743 |
| imputed | rs7649275 | 3 | 53733743 | A | G | 0.051643 | 0.170536 |
| imputed | rs17053417 | 3 | 53734429 | A | G | 0.140852 | 0.693104 |
| imputed | rs11719179 | 3 | 53734761 | A | G | 0.069926 | 0.0757988 |
| imputed | rs1020819 | 3 | 53737753 | A | C | 0.477101 | 0.695866 |
| imputed | rs2612033 | 3 | 53741066 | C | T | 0.051629 | 0.170861 |
| imputed | rs2029331 | 3 | 53742729 | C | G | 0.172573 | 0.641362 |
| imputed | rs17030975 | 3 | 53743245 | C | T | 0.412553 | 0.546145 |
| imputed | rs1045958 | 3 | 53744519 | C | T | 0.215696 | 0.0771334 |
| imputed | rs898423 | 3 | 53744805 | A | G | 0.231662 | 0.356364 |
| imputed | rs6800641 | 3 | 53745628 | A | G | 0.153385 | 0.823146 |
| imputed | rs2612028 | 3 | 53750487 | C | T | 0.123844 | 0.0452602 |
| imputed | rs2612027 | 3 | 53751718 | A | G | 0.483107 | 0.00575574 |
| imputed | rs2612026 | 3 | 53752035 | C | T | 0.161979 | 0.117266 |
| imputed | rs2680648 | 3 | 53752216 | C | T | 0.202035 | 0.0257444 |
| imputed | rs2612025 | 3 | 53753354 | C | T | 0.162663 | 0.133273 |
| imputed | rs2253795 | 3 | 53753915 | G | T | 0.124942 | 0.0474546 |
| imputed | rs3821860 | 3 | 53754865 | A | G | 0.194736 | 0.793547 |
| imputed | rs17053459 | 3 | 53756034 | A | G | 0.062464 | 0.0248007 |
| imputed | rs1809282 | 3 | 53756997 | A | G | 0.174244 | 0.114866 |
| imputed | rs719260 | 3 | 53764212 | C | T | 0.202151 | 0.0293601 |
| imputed | rs17053476 | 3 | 53764611 | C | T | 0.054917 | 0.830119 |
| imputed | rs7373253 | 3 | 53764634 | C | T | 0.047577 | 0.166375 |
| imputed | rs3774563 | 3 | 53765316 | A | G | 0.324104 | 0.38218 |
| imputed | rs4687738 | 3 | 53765449 | A | G | 0.031756 | 0.681566 |
| imputed | rs1401497 | 3 | 53766496 | A | G | 0.374156 | 0.37483 |
| imputed | rs755886 | 3 | 53766988 | A | T | 0.076469 | 0.325609 |
| imputed | rs12487452 | 3 | 53767451 | C | G | 0.428995 | 0.123964 |
| imputed | rs3796347 | 3 | 53767930 | A | G | 0.38744 | 0.709586 |
| imputed | rs3774573 | 3 | 53775000 | C | T | 0.226126 | 0.0640128 |

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|-----------|------------|---|----------|---|---|----------|-------------|
| imputed | rs1109959 | 3 | 53775262 | C | T | 0.081633 | 0.084326 |
| imputed | rs3774577 | 3 | 53777303 | C | T | 0.214881 | 0.847773 |
| imputed | rs3821865 | 3 | 53777335 | C | T | 0.483138 | 0.038997 |
| imputed | rs3774581 | 3 | 53777788 | A | G | 0.333624 | 0.0241198 |
| imputed | rs3774586 | 3 | 53786346 | A | G | 0.468061 | 0.0526836 |
| imputed | rs7617553 | 3 | 53788272 | A | G | 0.488338 | 0.00935734 |
| imputed | rs1829423 | 3 | 53789237 | A | G | 0.481822 | 0.0158282 |
| imputed | rs11707420 | 3 | 53790905 | A | G | 0.457621 | 0.0391082 |
| imputed | rs3774589 | 3 | 53792398 | G | T | 0.471245 | 0.0331647 |
| imputed | rs3774598 | 3 | 53797359 | A | G | 0.060806 | 0.579825 |
| genotyped | rs3774601 | 3 | 53797933 | A | G | 0.198428 | 0.0976903 |
| imputed | rs3774602 | 3 | 53798138 | C | T | 0.451118 | 0.00490801 |
| imputed | rs3774604 | 3 | 53799176 | C | T | 0.173542 | 0.147659 |
| genotyped | rs3774605 | 3 | 53805807 | A | G | 0.100786 | 0.167836 |
| imputed | rs3774608 | 3 | 53807752 | A | G | 0.489967 | 0.00588698 |
| imputed | rs3774609 | 3 | 53807943 | G | T | 0.48872 | 0.00771914 |
| imputed | rs3796349 | 3 | 53808549 | A | G | 0.241296 | 0.00131746 |
| imputed | rs2359133 | 3 | 53811782 | C | G | 0.224395 | 0.326069 |
| imputed | rs6766988 | 3 | 53814510 | A | T | 0.186663 | 0.532592 |
| imputed | rs3774611 | 3 | 53815705 | A | G | 0.424272 | 0.0149894 |
| imputed | rs7620619 | 3 | 53816844 | G | T | 0.040256 | 0.52209 |
| imputed | rs10154841 | 3 | 53820335 | C | T | 0.236889 | 0.23392 |
| imputed | rs10490844 | 3 | 53821117 | A | G | 0.084389 | 0.20107 |
| imputed | rs877483 | 3 | 53821781 | C | T | 0.255213 | 0.811308 |
| imputed | rs877484 | 3 | 53821964 | A | G | 0.468123 | 0.155127 |
| imputed | rs893363 | 3 | 53822102 | A | G | 0.244722 | 0.107912 |
| imputed | rs4687587 | 3 | 53824550 | A | G | 0.045688 | 0.000857143 |
| imputed | rs7625247 | 3 | 53829108 | G | T | 0.423125 | 0.323176 |
| imputed | rs9836592 | 3 | 53830123 | C | T | 0.149111 | 0.0139736 |
| imputed | rs7626693 | 3 | 53833581 | C | T | 0.469813 | 0.29628 |
| imputed | rs13317328 | 3 | 53845880 | A | C | 0.294388 | 0.0122726 |
| imputed | rs6445607 | 3 | 53852189 | G | T | 0.302292 | 0.539262 |
| imputed | rs3774616 | 3 | 53852973 | C | T | 0.201335 | 0.0139659 |
| imputed | rs1025690 | 3 | 53857703 | A | G | 0.11246 | 0.0442932 |
| imputed | rs999514 | 3 | 53864889 | C | T | 0.245371 | 0.0065726 |
| imputed | rs2232344 | 3 | 53866727 | A | G | 0.010864 | 0.870174 |
| imputed | rs17053571 | 3 | 53876834 | C | T | 0.171024 | 0.0212077 |
| imputed | rs2289204 | 3 | 53881374 | A | C | 0.179411 | 0.0214243 |
| imputed | rs2276847 | 3 | 53900815 | C | T | 0.170387 | 0.0280084 |
| imputed | rs7636856 | 3 | 53909211 | A | G | 0.21158 | 0.00484205 |
| imputed | rs7624521 | 3 | 53923356 | G | T | 0.361294 | 0.00433826 |
| imputed | rs11130386 | 3 | 53968526 | A | G | 0.17175 | 0.0482104 |

Table S4 General power analysis of testing dataset

| OR \ MAF | 0.05 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 |
|----------|-------|-------|-------|-------|-------|-------|
| 1.1 | 0.107 | 0.147 | 0.184 | 0.182 | 0.159 | 0.127 |
| 1.2 | 0.272 | 0.414 | 0.525 | 0.512 | 0.434 | 0.324 |
| 1.3 | 0.505 | 0.716 | 0.829 | 0.810 | 0.719 | 0.562 |
| 1.4 | 0.727 | 0.905 | 0.961 | 0.950 | 0.894 | 0.758 |
| 1.5 | 0.878 | 0.978 | 0.994 | 0.991 | 0.968 | 0.882 |

OR: odds ratio; MAF: minor allele frequency

Table S5 General power analysis of validation dataset

| OR \ MAF | 0.05 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 |
|----------|-------|-------|-------|-------|-------|-------|
| 1.1 | 0.158 | 0.233 | 0.301 | 0.296 | 0.252 | 0.193 |
| 1.2 | 0.461 | 0.668 | 0.789 | 0.773 | 0.682 | 0.530 |
| 1.3 | 0.783 | 0.938 | 0.979 | 0.972 | 0.932 | 0.817 |
| 1.4 | 0.948 | 0.995 | 0.999 | 0.999 | 0.992 | 0.949 |
| 1.5 | 0.993 | 0.999 | 0.999 | 0.999 | 0.999 | 0.989 |

OR: odds ratio; MAF: minor allele frequency