

**Supplementary Table 1. Blood eQTL data generated from GWAS genotyping and blood-based RNA expression data in ADNI**

Chr	SNP	A1	A2	MAF	$Z_{GWAS}$	$P_{GWAS}$	Transcript ID	Gene	$T_{eQTL}$	$P_{eQTL}$	FDR-corrected $P_{eQTL}$
1	rs4575098	A	G	0.228026	6.35743578	$2.05 \times 10^{-10}$	11760705_a_at	<i>NDUFS2</i>	-4.0452694	$5.85 \times 10^{-5}$	$1.68 \times 10^{-3}$
1	rs4575098	A	G	0.228026	6.35743578	$2.05 \times 10^{-10}$	11730923_x_at	<i>ADAMTS4</i>	-3.4327928	$6.35 \times 10^{-4}$	$1.48 \times 10^{-2}$
1	rs4575098	A	G	0.228026	6.35743578	$2.05 \times 10^{-10}$	11718419_at	<i>FCER1G</i>	-3.1782706	$1.55 \times 10^{-3}$	$3.09 \times 10^{-2}$
1	rs2093760	A	G	0.191962	8.82495729	$1.10 \times 10^{-18}$	11760294_a_at	<i>CD55</i>	-3.2667773	$1.14 \times 10^{-3}$	$2.46 \times 10^{-2}$
2	rs4663105	C	A	0.411349	13.9449582	$3.38 \times 10^{-44}$	11746895_a_at	<i>BINI</i>	5.42234123	$8.27 \times 10^{-8}$	$3.30 \times 10^{-6}$
2	rs4663105	C	A	0.411349	13.9449582	$3.38 \times 10^{-44}$	11741810_x_at	<i>BINI</i>	5.67610177	$2.07 \times 10^{-8}$	$9.63 \times 10^{-7}$
2	rs4663105	C	A	0.411349	13.9449582	$3.38 \times 10^{-44}$	11757435_x_at	<i>BINI</i>	5.67600123	$2.07 \times 10^{-8}$	$9.63 \times 10^{-7}$
2	rs4663105	C	A	0.411349	13.9449582	$3.38 \times 10^{-44}$	11719631_s_at	<i>BINI</i>	6.08815733	$1.94 \times 10^{-9}$	$1.28 \times 10^{-7}$
3	rs184384746	T	C	0.00110872	5.69454687	$1.24 \times 10^{-8}$	11715428_x_at	<i>ARF4</i>	3.36531377	$8.09 \times 10^{-4}$	$1.84 \times 10^{-2}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	11740691_x_at	<i>AIF1</i>	3.81204871	$1.51 \times 10^{-4}$	$3.92 \times 10^{-3}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	11731019_x_at	<i>AIF1</i>	3.32915398	$9.20 \times 10^{-4}$	$2.05 \times 10^{-2}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	11745266_x_at	<i>TAP2</i>	-6.3677094	$3.60 \times 10^{-10}$	$2.88 \times 10^{-8}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	11741632_a_at	<i>TAP2</i>	-5.9088386	$5.53 \times 10^{-9}$	$2.94 \times 10^{-7}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	11723059_a_at	<i>TAP2</i>	-3.1609819	$1.64 \times 10^{-3}$	$3.17 \times 10^{-2}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	11723058_a_at	<i>TAP2</i>	-6.5032296	$1.56 \times 10^{-10}$	$1.34 \times 10^{-8}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	11759642_x_at	<i>HLA-DRB1</i>	-3.9407455	$8.99 \times 10^{-5}$	$2.51 \times 10^{-3}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11755835_s_at	<i>GATS</i>	3.18361271	$1.52 \times 10^{-3}$	$3.09 \times 10^{-2}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11722909_a_at	<i>GATS</i>	10.3419453	$2.50 \times 10^{-23}$	$4.66 \times 10^{-21}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11756508_a_at	<i>TAF6</i>	-3.2251348	$1.32 \times 10^{-3}$	$2.79 \times 10^{-2}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11749146_x_at	<i>TAF6</i>	-3.7481712	$1.94 \times 10^{-4}$	$4.92 \times 10^{-3}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11728725_x_at	<i>TAF6</i>	-3.0149441	$2.67 \times 10^{-3}$	$4.97 \times 10^{-2}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11721727_x_at	<i>TAF6</i>	-3.8152085	$1.49 \times 10^{-4}$	$3.92 \times 10^{-3}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11730247_a_at	<i>PVRIG</i>	4.6251114	$4.51 \times 10^{-6}$	$1.40 \times 10^{-4}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11736389_x_at	<i>TRIM4</i>	-5.9689044	$3.91 \times 10^{-9}$	$2.28 \times 10^{-7}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11736388_a_at	<i>TRIM4</i>	-5.9612934	$4.08 \times 10^{-9}$	$2.28 \times 10^{-7}$

7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11732427_a_at	ZCWPW1	3.16076728	$1.65 \times 10^{-3}$	$3.17 \times 10^{-2}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11760666_x_at	ZKSCAN1	4.86984486	$1.40 \times 10^{-6}$	$4.89 \times 10^{-5}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11760665_at	ZKSCAN1	5.46541079	6.56E-08	$2.72 \times 10^{-6}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	11732213_x_at	ZKSCAN1	-3.3226381	$9.41 \times 10^{-4}$	$2.06 \times 10^{-2}$
7	rs7810606	T	C	0.485387	-6.6200683	$3.59 \times 10^{-11}$	11723373_a_at	EPHA1	4.7393005	$2.63 \times 10^{-6}$	$8.90 \times 10^{-5}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	11760710_a_at	MS4A6A	-4.7160648	$2.94 \times 10^{-6}$	$9.65 \times 10^{-5}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	11749293_x_at	MS4A6A	-10.840538	$2.64 \times 10^{-25}$	$5.91 \times 10^{-23}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	11716846_a_at	MS4A6A	-11.296622	$3.63 \times 10^{-27}$	$1.35 \times 10^{-24}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	11732866_x_at	MS4A4A	-5.8223336	$9.08 \times 10^{-9}$	$4.61 \times 10^{-7}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	11732865_a_at	MS4A4A	-5.5375868	$4.44 \times 10^{-8}$	$1.98 \times 10^{-6}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	11751570_a_at	MS4A4A	-6.0298488	$2.74 \times 10^{-9}$	$1.70 \times 10^{-7}$
14	rs12590654	A	G	0.33648	-6.3912394	$1.65 \times 10^{-10}$	11735593_a_at	SLC24A4	5.52351067	$4.79 \times 10^{-8}$	$2.06 \times 10^{-6}$
14	rs12590654	A	G	0.33648	-6.3912394	$1.65 \times 10^{-10}$	11735594_a_at	SLC24A4	4.61336689	$4.76 \times 10^{-6}$	$1.44 \times 10^{-4}$
15	rs442495	C	T	0.354342	-6.065891	$1.31 \times 10^{-9}$	11730885_a_at	FAM63B	5.30470232	$1.54 \times 10^{-7}$	$5.75 \times 10^{-6}$
15	rs442495	C	T	0.354342	-6.065891	$1.31 \times 10^{-9}$	11755773_x_at	FAM63B	5.37386384	$1.07 \times 10^{-7}$	$4.13 \times 10^{-6}$
15	rs11761801 7	T	C	0.124823	5.52218674	$3.35 \times 10^{-8}$	11740603_a_at	APH1B	6.87148987	$1.48 \times 10^{-11}$	$1.38 \times 10^{-9}$
15	rs11761801 7	T	C	0.124823	5.52218674	$3.35 \times 10^{-8}$	11740601_a_at	APH1B	6.25273694	$7.26 \times 10^{-10}$	$5.41 \times 10^{-8}$
15	rs11761801 7	T	C	0.124823	5.52218674	$3.35 \times 10^{-8}$	11720067_a_at	APH1B	6.10180361	$1.79 \times 10^{-9}$	$1.25 \times 10^{-7}$
15	rs11761801 7	T	C	0.124823	5.52218674	$3.35 \times 10^{-8}$	11720068_a_at	APH1B	7.21238813	$1.52 \times 10^{-12}$	$1.54 \times 10^{-10}$
15	rs11761801 7	T	C	0.124823	5.52218674	$3.35 \times 10^{-8}$	11740602_s_at	APH1B	7.43713411	$3.23 \times 10^{-13}$	$4.00 \times 10^{-11}$
16	rs59735493	A	G	0.298476	-5.4919099	$3.98 \times 10^{-8}$	11723657_a_at	ZNF668	-3.649139	$2.84 \times 10^{-4}$	$6.90 \times 10^{-3}$
17	rs11326053 1	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	11748594_a_at	RABEP1	-8.9138946	$4.82 \times 10^{-18}$	$7.70 \times 10^{-16}$
17	rs11326053 1	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	11718616_s_at	RABEP1	8.84651459	8.31E-18	$1.16 \times 10^{-15}$

17	rs11326053 1	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	11735601_at	<i>CHRNE</i>	3.83501354	$1.38 \times 10^{-4}$	$3.75 \times 10^{-3}$
17	rs11326053 1	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	11722495_a_at	<i>MYBBP1A</i>	-3.0364818	$2.49 \times 10^{-3}$	$4.71 \times 10^{-2}$
17	rs11326053 1	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	11722554_at	<i>NUP88</i>	-3.5512468	$4.11 \times 10^{-4}$	$9.76 \times 10^{-3}$
17	rs11326053 1	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	11747065_x_at	<i>NUP88</i>	-4.1539448	$3.70 \times 10^{-5}$	$1.09 \times 10^{-3}$
17	rs11326053 1	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	11732435_at	<i>SCIMP</i>	3.73900931	$2.01 \times 10^{-4}$	$4.99 \times 10^{-3}$
19	rs11127889 2	G	C	0.147136	6.50193146	$7.93 \times 10^{-11}$	11746548_s_at	<i>CNN2</i>	-7.2762348	$9.85 \times 10^{-13}$	$1.10 \times 10^{-10}$
19	rs11127889 2	G	C	0.147136	6.50193146	$7.93 \times 10^{-11}$	11723416_x_at	<i>CNN2</i>	11.1991128	$9.17 \times 10^{-27}$	$2.56 \times 10^{-24}$
19	rs11127889 2	G	C	0.147136	6.50193146	$7.93 \times 10^{-11}$	11723414_a_at	<i>CNN2</i>	12.0514456	$2.33 \times 10^{-30}$	$1.30 \times 10^{-27}$
19	rs11127889 2	G	C	0.147136	6.50193146	$7.93 \times 10^{-11}$	11723415_s_at	<i>CNN2</i>	13.2170534	$1.56 \times 10^{-35}$	$1.74 \times 10^{-32}$
20	rs6014724	G	A	0.095041 6	-6.1762414	$6.56 \times 10^{-10}$	11739100_a_at	<i>CSTF1</i>	-4.6308011	$4.39 \times 10^{-6}$	$1.40 \times 10^{-4}$
20	rs6014724	G	A	0.095041 6	-6.1762414	$6.56 \times 10^{-10}$	11741029_x_at	<i>CSTF1</i>	-5.2978528	$1.60 \times 10^{-7}$	$5.77 \times 10^{-6}$
20	rs6014724	G	A	0.095041 6	-6.1762414	$6.56 \times 10^{-10}$	11718943_a_at	<i>AURKA</i>	-3.1969674	$1.46 \times 10^{-3}$	$3.01 \times 10^{-2}$

Abbreviations: A1: minor allele; A2: major allele; ADNI: Alzheimer's Disease Neuroimaging Initiative; Chr: chromosome; eQTL: expression quantitative trait loci; FDR: false discovery rate; GWAS: genome-wide association studies; MAF: minor allele frequency;  $P_{eQTL}$ :  $P$ -value of eQTL analysis;  $P_{GWAS}$ :  $P$ -value of GWAS; SNP: single nucleotide polymorphism;  $T_{eQTL}$ :  $T$ -value of eQTL analysis; Transcript ID: transcript identifier of Affymetrix Human Genome U219 Array;  $Z_{GWAS}$ :  $Z$ -value of GWAS

**Supplementary Table 2. Blood eQTL data generated from GWAS genotyping and blood-based RNA expression data in AddNeuroMed**

Chr	SNP	A1	A2	MAF	$Z_{GWAS}$	$P_{GWAS}$	Transcript ID	Gene	$T_{eQTL}$	$P_{eQTL}$	FDR-corrected $P_{eQTL}$
1	rs4575098	A	G	0.228026	6.35743578	$2.05 \times 10^{-10}$	ILMN_2123743	<i>FCER1G</i>	-5.51947	$5.64 \times 10^{-8}$	$5.13 \times 10^{-6}$
1	rs4575098	A	G	0.228026	6.35743578	$2.05 \times 10^{-10}$	ILMN_1658383	<i>HSPA6</i>	-3.0937678	$2.09 \times 10^{-3}$	$3.57 \times 10^{-2}$
2	rs4663105	C	A	0.411349	13.9449582	$3.38 \times 10^{-44}$	ILMN_1674160	<i>BINI</i>	4.3979003	$1.35 \times 10^{-5}$	$5.22 \times 10^{-4}$
2	rs4663105	C	A	0.411349	13.9449582	$3.38 \times 10^{-44}$	ILMN_2309245	<i>BINI</i>	3.316668	$9.82 \times 10^{-4}$	$2.06 \times 10^{-2}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	ILMN_1808405	<i>HLA-DQA1</i>	8.42798982	$4.35 \times 10^{-16}$	$1.19 \times 10^{-13}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	ILMN_2157441	<i>HLA-DRA</i>	-4.3701113	$1.53 \times 10^{-5}$	$5.22 \times 10^{-4}$
6	rs6931277	T	A	0.156437	-6.4930489	$8.41 \times 10^{-11}$	ILMN_1774074	<i>RXRΒ</i>	3.10664257	$2.01 \times 10^{-3}$	$3.57 \times 10^{-2}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	ILMN_1699631	<i>GATS</i>	7.86935366	$2.49 \times 10^{-14}$	3.39E-12
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	ILMN_1768754	<i>PILRB</i>	-4.4400456	$1.12 \times 10^{-5}$	$5.11 \times 10^{-4}$
7	rs1859788	A	G	0.32433	-7.9282106	$2.22 \times 10^{-15}$	ILMN_2323385	<i>TRIM4</i>	3.19269627	$1.50 \times 10^{-3}$	$2.93 \times 10^{-2}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	ILMN_1721035	<i>MS4A6A</i>	-4.7802007	$2.35 \times 10^{-6}$	$1.28 \times 10^{-4}$
11	rs2081545	A	C	0.382122	-7.9728583	$1.55 \times 10^{-15}$	ILMN_2359800	<i>MS4A6A</i>	-3.9721891	$8.24 \times 10^{-5}$	$2.25 \times 10^{-3}$
15	rs117618017	T	C	0.124823	5.52218674	$3.35 \times 10^{-8}$	ILMN_1767816	<i>APH1B</i>	4.1199093	$4.48 \times 10^{-5}$	$1.36 \times 10^{-3}$
16	rs59735493	A	G	0.298476	-5.4919099	$3.98 \times 10^{-8}$	ILMN_2254635	<i>ITGAX</i>	-3.519294	$4.75 \times 10^{-4}$	$1.18 \times 10^{-2}$
17	rs113260531	A	G	0.126086	6.12333064	$9.16 \times 10^{-10}$	ILMN_1719622	<i>RABEP1</i>	5.27089797	$2.07 \times 10^{-7}$	$1.42 \times 10^{-5}$
19	rs76320948	T	C	0.0307669	5.46447952	$4.64 \times 10^{-8}$	ILMN_2369785	<i>SNRPD2</i>	-3.3724035	$8.07 \times 10^{-4}$	$1.84 \times 10^{-2}$
19	rs76320948	T	C	0.0307669	5.46447952	$4.64 \times 10^{-8}$	ILMN_1665831	<i>CLPTM1</i>	2.98652997	$2.97 \times 10^{-3}$	$4.77 \times 10^{-2}$

Abbreviations: A1: minor allele; A2: major allele; Chr: chromosome; eQTL: expression quantitative trait loci; FDR: false discovery rate; GWAS: genome-wide association studies; MAF: minor allele frequency;  $P_{eQTL}$ :  $P$ -value of eQTL analysis;  $P_{GWAS}$ :  $P$ -value of GWAS; SNP: single nucleotide polymorphism;  $T_{eQTL}$ :  $T$ -value of eQTL analysis; Transcript ID: transcript identifier of Illumina Human HT-12 v3 Expression BeadChips;  $Z_{GWAS}$ :  $Z$ -value of GWAS

**Supplementary Table 3. Results of differential gene expression analysis between AD, MCI and CN in ADNI**

Transcript ID	Gene	$T_{MCI}$	$P_{MCI}$	FDR-corrected $P_{MCI}$	$T_{AD}$	$P_{AD}$	FDR-corrected $P_{AD}$
11720068 a at	<i>APHIB</i>	2.37950761	0.01762073	0.16739694	3.60610847	0.00033443	0.00635408
11740603 a at	<i>APHIB</i>	2.10584783	0.03559698	0.22544756	3.16482438	0.00162355	0.01542369
11716846 a at	<i>MS4A6A</i>	1.1665279	0.24382497	0.71737066	2.30155332	0.02167287	0.1167574
11741810 x at	<i>BINI</i>	-0.5361022	0.59206965	0.71737066	-2.2336531	0.02584223	0.1167574
11719631 s at	<i>BINI</i>	-1.4925036	0.13604792	0.51698209	-2.1331814	0.03328033	0.1167574
11757435 x at	<i>BINI</i>	-1.7392231	0.0824646	0.39170684	-2.0914613	0.03687076	0.1167574
11746895 a at	<i>BINI</i>	-0.5659524	0.5716197	0.71737066	-1.8577023	0.06365917	0.17278917
11755835 s at	<i>GATS</i>	3.08088286	0.00215024	0.04085449	1.64800038	0.09983143	0.23709964
11749293_x_at	<i>MS4A6A</i>	0.93342924	0.35094182	0.71737066	1.46129947	0.14441209	0.30486997
11722909 a at	<i>GATS</i>	0.80371346	0.42185361	0.71737066	1.37139168	0.17072179	0.3243714
11748594 a at	<i>RABEP1</i>	-1.0805145	0.28031023	0.71737066	-1.2710846	0.20414909	0.35262115
11760710 a at	<i>MS4A6A</i>	0.22731267	0.82025144	0.86582097	1.1901364	0.23442331	0.37117024
11718419 at	<i>FCER1G</i>	-0.0111897	0.99107547	0.99107547	1.06608133	0.28677908	0.41913866
11720067 a at	<i>APHIB</i>	-0.3513944	0.72540528	0.81074708	0.47572597	0.63442799	0.80384508
11718616 s at	<i>RABEP1</i>	-0.6529023	0.51404833	0.71737066	-0.4754644	0.63461453	0.80384508
11736388 a at	<i>TRIM4</i>	-0.5187621	0.60410161	0.71737066	0.2555444	0.79838276	0.94807953
11740601 a at	<i>APHIB</i>	-0.7431566	0.45765291	0.71737066	0.10536262	0.91612029	0.95095326
11736389 x at	<i>TRIM4</i>	-0.8272241	0.40841083	0.71737066	0.06291794	0.94985102	0.95095326
11740602 s at	<i>APHIB</i>	-0.8946098	0.3713238	0.71737066	0.06153327	0.95095326	0.95095326

$T$  value and  $P$  values were obtained from analysis of covariance for diagnosis group (CN, MCI and AD) with adjustment of age and sex.

Abbreviations: AD: Alzheimer's disease; ADNI: Alzheimer's Disease Neuroimaging Initiative; CN: cognitively normal older adults; FDR: false discovery rate; MCI: mild cognitive impairment;  $P_{AD}$ :  $P$ -value for AD diagnosis;  $P_{MCI}$ :  $P$ -value for MCI diagnosis;  $T_{AD}$ :  $T$ -value for AD diagnosis;  $T_{MCI}$ :  $T$ -value for MCI diagnosis; Transcript ID: transcript identifier of Affymetrix Human Genome U219 Array