Supplemental Table 1 | Contributing institutions

Center	*n*
Boston University	9
Columbia University Medical Center	13
Emory University	7
Johns Hopkins University	27
Massachusetts Alzheimer's Disease Research Center	27
Mayo Clinic	16
Newcastle University	23
Northwestern University	5
Oregon Health Sciences University	68
University of Pittsburgh	17
Rush University Medical Center	48
Icahn School of Medicine at Mount Sinai	113
Banner Sun Health Research Institute	84
University of California, Irvine	39
University of California, San Diego	3
University of Kentucky	18
University of Pennsylvania	19
University of Texas Southwestern	25
University of Washington	20
Medical University of Vienna	21
Washington University in Saint Louis	45

Supplemental Table 2 | Association of rs56405341 with braak stage in PART

Test conditions	Sample size (*n*)	Beta	Standard error	Z-score	L95	U95	t-statistic	*p*
Braak stage, Global Screening array	207	0.203	0.082	2.48	0.042	0.364	2.48	1.42E-02
Braak stage, Omni-express chip	440	0.279	0.056	4.94	0.168	0.389	4.94	1.11E-06
Meta analysis	647	-	-	5.404	-	-	-	5.61E-8 (++)

Supplemental Table 3 | Associations with Braak stage in PART (p <5.0E−06)

Chr	SNP	Base pair	A1	Beta	SE	L95	U95	t-statistic	*p*
2	rs78580932	11935322	C	-0.5493	0.1068	-0.7586	-0.3401	-5.146	3.55E-07
2	rs74600760	235768810	T	-0.5306	0.1092	-0.7446	-0.3166	-4.86	1.48E-06
3	rs111610564	61518166	C	-0.4981	0.1034	-0.7007	-0.2955	-4.818	1.81E-06
3	rs75367690	61518193	A	-0.4981	0.1034	-0.7007	-0.2955	-4.818	1.81E-06
3	rs78367818	61518380	T	-0.484	0.1017	-0.6834	-0.2846	-4.757	2.43E-06
3	rs76293999	61518765	C	-0.4981	0.1034	-0.7007	-0.2955	-4.818	1.81E-06
3	rs80325426	61521640	T	-0.4981	0.1034	-0.7007	-0.2955	-4.818	1.81E-06
3	rs349509	140216029	A	-0.7761	0.1562	-1.082	-0.47	-4.969	8.64E-07
3	rs13323081	179019705	G	0.2428	0.04697	0.1507	0.3348	5.169	3.16E-07
3	rs13078538	179020722	A	0.235	0.0469	0.1431	0.3269	5.011	7.01E-07
4	rs56405341	130085480	A	0.2555	0.04625	0.1649	0.3462	5.524	4.82E-08
4	rs17431373	130096062	A	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs11729109	130096820	A	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs1588808	130099986	C	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs59779898	130104994	T	0.2423	0.04665	0.1508	0.3337	5.193	2.78E-07
4	rs61470543	130105269	T	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs35311431	130107476	T	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs34495244	130107609	G	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	4:130107649	130107649	C	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs13131099	130107755	C	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs13131323	130107819	G	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs13103701	130107864	T	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs13137298	130108224	C	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	4:130108226	130108226	A	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs13110313	130108278	A	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs11731055	130108518	T	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs17790747	130112972	A	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs60645642	130113055	T	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs11099002	130114081	A	0.2403	0.04701	0.1482	0.3325	5.112	4.21E-07
4	rs10518545	130114848	G	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07
4	rs11737273	130115077	A	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07
4	rs11732872	130115144	T	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07
4	rs10494318	130115306	A	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07
4	rs11099003	130115445	A	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07
4	rs12512996	130115623	C	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07
4	rs12650648	130117960	A	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07

Supplemental table 3 (continued)

4	rs12650648	130117960	A	0.2361	0.04689	0.1442	0.3279	5.035	6.24E-07
4	rs77506227	137329297	A	-0.797	0.1633	-1.117	-0.4769	-4.881	1.34E-06
4	rs144061068	137341719	C	-0.797	0.1633	-1.117	-0.4769	-4.881	1.34E-06
4	rs185142484	137341721	T	-0.797	0.1633	-1.117	-0.4769	-4.881	1.34E-06
5	rs3762996	150469626	T	0.2238	0.04732	0.131	0.3165	4.729	2.78E-06
5	rs4958886	150471564	T	0.2237	0.04712	0.1313	0.316	4.747	2.55E-06
5	rs4958888	150472842	A	0.2245	0.04655	0.1333	0.3157	4.823	1.77E-06
5	rs6579838	150473104	C	0.2339	0.0459	0.1439	0.3239	5.096	4.57E-07
10	rs150945906	124487608	A	-0.648	0.1359	-0.9144	-0.3816	-4.768	2.31E-06
15	rs147462127	24515682	T	-0.8445	0.1697	-1.177	-0.5118	-4.976	8.37E-07
15	rs185845364	36865219	G	-0.7974	0.1613	-1.113	-0.4813	-4.944	9.79E-07
15	rs117904408	36896306	A	-0.7974	0.1613	-1.113	-0.4813	-4.944	9.79E-07
15	rs79271917	36927641	C	-0.7744	0.158	-1.084	-0.4647	-4.901	1.21E-06
17	rs12948330	1872722	A	-0.2143	0.04588	-0.3043	-0.1244	-4.671	3.66E-06
17	rs12451228	1877740	C	-0.2153	0.04642	-0.3063	-0.1243	-4.638	4.26E-06
17	rs12948582	1879231	A	-0.2152	0.04656	-0.3064	-0.1239	-4.621	4.62E-06
17	rs12946465	1879293	C	-0.2189	0.04607	-0.3092	-0.1286	-4.751	2.51E-06
19	rs10415392	45719790	T	0.3449	0.07118	0.2054	0.4844	4.846	1.59E-06
20	rs78923929	56754110	A	-0.6559	0.1326	-0.9158	-0.3959	-4.945	9.76E-07

chr=chromosome, SNP=single nucleotide polymorphism, SE=standard error

Supplementary Table 4 | SNPs in LD with rs5605341

Chr	Position	LD (r^2)	LD (D')	variant	Ref	Alt	AFR freq	AMR freq	ASN freq	EUR freq	Sig level this GWAS
4	129164325	1	1	rs56405341	G	A	0.18	0.23	0.09	0.27	4.822E-08
4	129174907	0.82	0.95	rs17431373	G	A	0.2	0.25	0.14	0.29	4.211E-07
4	129175665	0.81	0.94	rs11729109	G	A	0.2	0.25	0.14	0.29	4.211E-07
4	129178831	0.81	0.94	rs1588808	A	C	0.23	0.26	0.14	0.29	4.211E-07
4	129186321	0.81	0.93	rs35311431	G	T	0.21	0.25	0.15	0.29	4.211E-07
4	129186454	0.81	0.94	rs34495244	A	G	0.21	0.25	0.15	0.29	4.211E-07
4	129186600	0.8	0.93	rs13131099	T	C	0.21	0.25	0.15	0.28	4.211E-07
4	129186664	0.81	0.94	rs13131323	T	G	0.21	0.25	0.15	0.29	4.211E-07
4	129186709	0.81	0.94	rs13103701	C	T	0.21	0.25	0.15	0.29	4.211E-07
4	129187069	0.8	0.93	rs13137298	T	C	0.2	0.25	0.15	0.29	4.211E-07
4	129187123	0.8	0.93	rs13110313	G	A	0.2	0.25	0.15	0.29	4.211E-07
4	129187363	0.8	0.93	rs11731055	C	T	0.2	0.25	0.15	0.29	4.211E-07
4	129191817	0.81	0.94	rs17790747	C	A	0.21	0.25	0.15	0.29	4.211E-07
4	129191900	0.81	0.94	rs60645642	A	T	0.21	0.25	0.15	0.29	4.211E-07
4	129192926	0.81	0.94	rs11099002	G	A	0.21	0.25	0.15	0.29	4.211E-07
4	129193693	0.81	0.94	rs10518545	A	G	0.21	0.25	0.15	0.29	6.238E-07
4	129193922	0.81	0.94	rs11737273	T	A	0.21	0.25	0.15	0.29	6.238E-07
4	129193989	0.81	0.94	rs11732872	C	T	0.21	0.25	0.15	0.29	6.238E-07
4	129194151	0.81	0.94	rs10494318	G	A	0.21	0.25	0.15	0.29	6.238E-07
4	129194290	0.81	0.94	rs11099003	G	A	0.21	0.25	0.15	0.29	6.238E-07
4	129194468	0.81	0.94	rs12512996	T	C	0.23	0.26	0.15	0.29	6.238E-07
4	129196805	0.81	0.94	rs12650648	G	A	0.21	0.25	0.15	0.29	6.238E-07

chr=chromosome, LD=linkage disequilibrium, AFR=African, AMR=American, ASN=Asian, EUR=European

Supplemental Table 5 | Associations in PART with known AD and PSP risk alleles

Chr	SNP	Base pair	GENE	A1	Associated disease	beta	SE	L95	U95	t-statistic	*p*
14	rs12590654	92938855	SLC24A4	A	AD	-0.1416	0.0445	-0.229	-0.054	-3.1850	**0.0015**
11	rs1582763	60021948	MS4A6A	A	AD	-0.1074	0.0435	-0.193	-0.022	-2.4690	**0.0138**
11	rs2081545	59958380	MS4A6A	A	AD	-0.1029	0.0436	-0.188	-0.017	-2.3610	**0.0185**
4	rs7657553	11723235	HS3ST1	A	AD	0.1082	0.0483	0.014	0.203	2.2390	**0.0255**
17	rs242557	44019712	MAPT	A	PSP	0.1046	0.0468	0.013	0.196	2.2370	**0.0256**
11	rs7935829	59942815	MS4A6A	G	AD	-0.0957	0.0433	-0.181	-0.011	-2.2110	**0.0274**
2	rs7571971	88895351	EIF2AK3	T	PSP	-0.0990	0.0474	-0.192	-0.006	-2.0870	**0.0373**
17	rs8070723	44081064	MAPT	G	PSP	-0.0907	0.0525	-0.194	0.012	-1.7290	0.0843
11	rs11218343	121435587	SORL1	C	AD	0.1607	0.0952	-0.026	0.347	1.6880	0.0920
1	rs4575098	161155392	ADAMTS4	A	AD	0.0803	0.0499	-0.018	0.178	1.6090	0.1082
12	rs11568563	21457434	SLCO1A2	G	PSP	-0.1419	0.0916	-0.321	0.038	-1.5490	0.1220
16	rs59735493	31133100	KAT8	A	AD	0.0666	0.0470	-0.026	0.159	1.4160	0.1572
11	rs867611	85776544	PICALM	G	AD	0.0636	0.0452	-0.025	0.152	1.4080	0.1597
11	rs3844143	85850243	PICALM	T	AD	-0.0531	0.0425	-0.136	0.030	-1.2510	0.2114
2	rs4663105	127891427	BIN1	C	AD	0.0520	0.0439	-0.034	0.138	1.1840	0.2368
7	rs1859788	99971834	ZCWPW1	A	AD	-0.0544	0.0461	-0.145	0.036	-1.1790	0.2390
17	rs28394864	47450775	ABI3	A	AD	-0.0485	0.0430	-0.133	0.036	-1.1270	0.2603
11	rs10792832	85867875	PICALM	A	AD	0.0473	0.0439	-0.039	0.133	1.0780	0.2816
7	rs7384878	99932049	ZCWPW1	C	AD	-0.0498	0.0465	-0.141	0.041	-1.0710	0.2844
10	rs11257238	11717397	ECHDC3	C	AD	0.0446	0.0440	-0.042	0.131	1.0150	0.3106
6	rs9381563	47432637	CD2AP	C	AD	0.0436	0.0444	-0.043	0.131	0.9825	0.3262
18	rs76726049	56189459	ALPK2	C	AD	-0.1423	0.1499	-0.436	0.151	-0.9496	0.3427
19	rs76320948	46241841	AC074212.3	T	AD	0.1188	0.1253	-0.127	0.364	0.9478	0.3436
6	rs12203592	396321	IRF4	T	PSP	-0.0367	0.0521	-0.139	0.065	-0.7044	0.4814
19	rs111278892	1039323	ABCA7	G	AD	-0.0431	0.0623	-0.165	0.079	-0.6919	0.4892
6	rs6931277	32583357	HLA-DRB1	T	AD	-0.0356	0.0545	-0.143	0.071	-0.6530	0.5140
1	rs6656401	207692049	CR1	A	AD	-0.0329	0.0587	-0.148	0.082	-0.5615	0.5746
17	rs9916042	4984447	SCIMP	A	AD	0.0263	0.0475	-0.067	0.119	0.5547	0.5793
1	rs2093760	207786828	CR1	A	AD	-0.0315	0.0575	-0.144	0.081	-0.5483	0.5837
1	rs1411478	180962282	STX6	A	PSP	-0.0236	0.0437	-0.109	0.062	-0.5397	0.5896
1	rs679515	207750568	CR1	T	AD	-0.0311	0.0588	-0.146	0.084	-0.5292	0.5969
8	rs1532278	27466315	CLU/PTK2B	T	AD	0.0213	0.0448	-0.067	0.109	0.4746	0.6352

Supplemental table 5 (continued)

15	rs117618017	63569902	APH1B	T	AD	-0.0294	0.0654	-0.158	0.099	-0.4490	0.6536
19	rs4147929	1063443	ABCA7	A	AD	-0.0258	0.0579	-0.139	0.088	-0.4455	0.6561
2	rs10933431	233981912	INPPD5	G	AD	0.0182	0.0494	-0.079	0.115	0.3673	0.7136
17	rs113260531	5138980	SCIMP	A	AD	-0.0246	0.0670	-0.156	0.107	-0.3666	0.7140
19	rs75627662	45413576	APOE	T	AD	-0.0215	0.0607	-0.140	0.097	-0.3538	0.7236
4	rs6448453	11026028	CLNK	A	AD	-0.0159	0.0470	-0.108	0.076	-0.3392	0.7346
4	rs6448451	11024682	CLNK	G	AD	-0.0156	0.0470	-0.108	0.077	-0.3310	0.7408
19	rs3752241	1053524	ABCA7	G	AD	0.0190	0.0584	-0.095	0.133	0.3261	0.7444
1	rs6687758	222164948	DUSP10	G	PSP	0.0177	0.0547	-0.090	0.125	0.3241	0.7460
10	rs11257242	11721119	ECHDC3	C	AD	-0.0136	0.0445	-0.101	0.074	-0.3049	0.7606
8	rs4236673	27464929	CLU/PTK2B	A	AD	0.0116	0.0447	-0.076	0.099	0.2593	0.7955
3	rs1768208	39523003	MOBP	T	PSP	0.0110	0.0472	-0.082	0.104	0.2330	0.8158
19	rs41289512	45351516	APOE	G	AD	0.0237	0.1369	-0.245	0.292	0.1729	0.8628
19	rs41289512	45351516	APOE	G	AD	0.0237	0.1369	-0.245	0.292	0.1729	0.8628
15	rs442495	59022615	ADAM10	C	AD	-0.0038	0.0465	-0.095	0.087	-0.0810	0.9355
20	rs6014724	54998544	CASS4	G	AD	-0.0055	0.0709	-0.144	0.133	-0.0770	0.9387
17	rs2632516	56409089	BZRAP1-AS1	C	AD	-0.0019	0.0450	-0.090	0.086	-0.0412	0.9672
7	rs11763230	143108841	EPHA1	T	AD	-0.0021	0.0567	-0.113	0.109	-0.0375	0.9701
19	rs3865444	51727962	CD33	A	AD	0.0015	0.0459	-0.088	0.092	0.0333	0.9735
7	rs7810606	143108158	EPHA1	T	AD	-0.0012	0.0426	-0.085	0.082	-0.0284	0.9773

chr=chromosome, SNP=single nucleotide polymorphism, SE=standard error

Supplementary Table 6 | Assessments of JADE1 and P-tau immunohistochemistry on tauopathy subjects

				JADE1 immunohistochemistry							
Case	Diagnosis	Age	Sex	NFT burden	CTE lesion	ARTAG	Astrocytic plaques	tufted astrocytes	coiled bodies	Aβ plaque neurites	Other pathology
1	PART	90	F	+++	N	0	0	0	0	0	
2	PART	90	F	+	N	0	0	0	0	0	
3	PART	81	M	+	N	0	0	0	0	0	
4	AD	82	M	+++	N	0	0	0	0	+	
5	AD	63	M	+	N	+	+	0	+	2	
6	AD	83	F	+++	N	+	0	0	0	2	
7	PSP	69	M	+	N	+	++	++	2	0	
8	PSP	71	M	++	N	0	+	+	+	0	
9	PSP	64	M	+	N	0	0	+	+	0	
10	CBD	72	M	+	N	0	0	0	0	0	
11	CBD	75	F	+	N	0	+	+	0	0	
12	CBD	63	XX	+	N	0	++	0	0	0	
13	CTE	XX	XX	+	Y	+	+	0	0	+	
14	CTE	83	M	++	Y	++	++	+	+	0	
15	CTE	77	M	++	Y	++	++	+	+	2	
16	GD, AD, CT	85	M	+	N	++	0	0	0	+	+/- (grains)
17	AGD, PART	88	F	+	N	+	+	0	0	0	+/- (grains)
17	PiD	40	M	0	N	0	0	0	0	0	
18	PiD	XX	XX	0	N	0	0	0	0	0	
19	PiD	XX	XX	0	N	0	0	0	0	0	

Scale: 0 none, + mild, ++ modeate, +++ severe pathology; HP (hippocampus), STN (subthalamic nucleus), F (frontal)

Supplemental table 6 (continued)

P-tau immunohistochemistry								
NFT burden	CTE lesion	ARTAG	Astrocytic plaques	tufted astrocytes	coiled bodies	Aβ plaque neurites	Other pathology	Regions checked
+++	N	0	0	0	0	0		HP
++	N	0	0	0	0	0		HP
++	N	0	0	0	0	0		HP
+++	N	+	0	0	0	+++		HP
+	N	+	+	0	+	++		HP
+++	N	+	0	0	+	++		HP
++	N	+	++	++	++	0		STN
+++	N	++	++	++	++	0	+/- (grains)	STN
+	N	+	0	+	+	0		STN
+++	N	++	++	++	0	0	+/- (grains)	F
+	N	+	++	+	+	0		F
++	N	+	+++	+	+	0		F
+	Y	++	++	+	0	0	+/- (grains)	F
++	Y	+++	++	++	+	0		F
+++	Y	+++	++	+	+	0		F
+++	N	+++	+	+	+	+	+/- (grains)	HP
+++	N	++	0	+	0	0	+/- (grains)	HP
+++	N	+	0	0	0	0	(grains), Pick bodi	F
++	N	++	0	0	+	0	Pick bodies	HP
+++	N	++	0	0	+	0	Pick bodies	HP