

Supplementary Table 10. Coloc results of Causal Genes Associate with different Brain Cells in Various Types of OA

snp	pvalues.dfi	MAF.dfi	N.dfi	V.dfi	z.dfi	r.dfi	IABF.dfi	pvalues.dfi	MAF.dfi	V.dfi	z.dfi	r.dfi	IABF.dfi	rna.sum	LSNP.PP.H4	Gene	bri.Cell	Cell	OA
rs6437374	0.1432	0.3594	396054	4.13E-05	1.463978	0.99897	-2.36838	2.95E-35	0.3594	0.014478	12.39032	0.608467	46.23706	43.86869	1	ACAP2	Astro	Astrocytes KneEOA	
rs1112892	0.01998	0.3698	396054	4.08E-05	2.326723	0.998982	-0.7409	4.01E-28	0.3698	0.014303	10.9956	0.61136	36.48511	35.74421	0.934077	EFHB	Astro	Astrocytes KneEOA	
rs1101099	0.003951	0.2708	396054	4.81E-05	2.882048	0.998799	0.785894	2.43E-14	0.2708	0.01688	7.625649	0.57135	16.18859	16.97448	0.802757	GSTM3	Astro	Astrocytes KneEOA	
rs1221659	0.003827	0.2749	396054	4.77E-05	2.89208	0.99881	0.810183	4.74E-08	0.2749	0.016723	5.460888	0.573648	8.127214	8.937397	0.908114	MM2D	Astro	Astrocytes KneEOA	
rs6650495	0.03028	0.471429	396054	3.81E-05	2.166408	0.999048	-1.13397	1.72E-09	0.471429	0.011466	6.022154	0.662427	11.46891	10.33494	0.959345	CHGA	Da	DopaminergicKneEOA	
rs143384	1.01E-23	0.402857	396054	3.95E-05	10.04046	0.999014	46.8949	0.117854	0.402857	0.011877	1.563844	0.65451	0.268942	47.16385	0.920463	CPNE1	Da	DopaminergicKneEOA	
rs3451743	0.008292	0.142857	396054	7.76E-05	2.639943	0.998064	0.354259	1.10E-11	0.142857	0.023333	6.792422	0.490909	10.98697	11.34123	0.873191	FUBP1	Da	DopaminergicKneEOA	
rs10088421	0.024	0.242857	396054	5.17E-05	2.257129	0.99871	-0.78258	6.52E-31	0.242857	0.015538	11.56061	0.591509	39.07931	38.29673	1	HMBOX1	Da	DopaminergicKneEOA	
rs143384	1.01E-23	0.402857	396054	3.95E-05	10.04046	0.999014	46.8949	0.04E-06	0.402857	0.011877	4.524838	0.65451	6.168871	53.06378	0.906909	MMP240S	Da	DopaminergicKneEOA	
rs3756337	0.0386	0.497143	396054	3.80E-05	2.068426	0.999051	-1.34286	2.21E-11	0.497143	0.011429	6.691404	0.663151	14.30219	12.95933	0.967381	PCDH9	Da	DopaminergicKneEOA	
rs1005176	0.02039	0.328571	396054	4.31E-05	2.319093	0.998925	-0.73137	3.08E-33	0.328571	0.012951	12.01178	0.634679	45.28322	44.55186	0.94881	RGS14	Da	DopaminergicKneEOA	
rs1087686	0.02333	0.38	396054	4.03E-05	2.267987	0.998993	-0.8811	1.49E-88	0.38	0.012127	19.95041	0.64978	128.7878	127.9067	0.939729	RPS26	Da	DopaminergicKneEOA	
rs1193583	0.008402	0.465714	396054	3.82E-05	2.635473	0.999046	-0.00813	7.31E-10	0.465714	0.011483	6.159122	0.662104	12.01588	12.00775	0.800604	TMEM128D	Da	DopaminergicKneEOA	
rs914187	0.01894	0.3724	396054	4.06E-05	2.34671	0.998985	-0.69567	2.10E-09	0.3724	0.014262	5.989913	0.612042	10.50632	9.81065	0.917965	BACE2	Endo	Endothelia KneEOA	
rs1344	0.02148	0.4531	396054	3.83E-05	2.299439	0.999043	-0.83444	3.31E-10	0.4531	0.013452	6.283453	0.62584	11.8631	11.02866	0.886852	ACP6	Ex	Excitatory KneEOA	
rs1004874	0.00301	0.2865	396054	4.65E-05	2.966715	0.99884	1.0161	8.16E-18	0.2865	0.016306	8.957301	0.5798	20.99404	22.01014	0.923373	ARHGAP2Ex	Ex	Excitatory KneEOA	
rs1112892	0.01998	0.3698	396054	4.08E-05	2.326723	0.998982	-0.7409	1.53E-27	0.3698	0.014303	10.87411	0.61136	35.67299	34.93209	0.915559	EFHB	Ex	Excitatory KneEOA	
rs1112892	0.01998	0.3698	396054	4.08E-05	2.326723	0.998982	-0.7409	3.99E-18	0.3698	0.014303	8.679075	0.61136	22.5532	21.8123	0.934944	EFHB	Ex	Excitatory KneEOA	
rs6742145	0.009426	0.2682	396054	4.84E-05	2.596204	0.998791	0.00689	3.16E-17	0.2682	0.016984	8.440663	0.569858	19.87789	19.88478	0.776434	GPR55	Ex	Excitatory KneEOA	
rs1101099	0.003951	0.2708	396054	4.81E-05	2.882048	0.998799	0.785894	8.93E-12	0.2708	0.01688	6.809032	0.57135	12.82117	13.60706	0.862503	GSTM3	Ex	Excitatory KneEOA	
rs1765012	0.01151	0.2656	396054	4.87E-05	2.526821	0.998784	-0.16755	2.26E-22	0.2656	0.017089	9.729471	0.568339	26.48016	26.31261	0.999869	LINC0215	Ex	Excitatory KneEOA	
rs1765012	0.01151	0.2656	396054	4.87E-05	2.526821	0.998784	-0.16755	2.80E-11	0.2656	0.017089	6.65661	0.568339	12.17162	12.00407	0.971179	LINC0215	Ex	Excitatory KneEOA	
rs1215098	0.01003	0.2917	396054	4.60E-05	2.574793	0.998852	-0.07385	3.22E-12	0.2917	0.016133	7.10371	0.582398	13.88809	13.81424	0.803436	MARCH2	Ex	Excitatory KneEOA	
rs393329	0.04867	0.4141	396054	3.92E-05	1.971471	0.999022	-1.52362	6.61E-18	0.4141	0.013739	8.621442	0.620881	22.58986	21.06624	0.871735	NPBP2	Ex	Excitatory KneEOA	
rs9782	0.007782	0.2917	396054	4.60E-05	2.661385	0.998852	0.152596	1.12E-21	0.2917	0.016133	9.371969	0.582398	25.14051	25.2931	0.866973	PAH	Ex	Excitatory KneEOA	
rs9782	0.007782	0.2917	396054	4.60E-05	2.661385	0.998852	0.152596	1.90E-17	0.2917	0.016133	8.499884	0.582398	20.60194	20.75454	0.916832	PAH	Ex	Excitatory KneEOA	
rs5608445	0.06059	0.2135	396054	5.66E-05	1.876476	0.998588	-1.52318	1.00E-20	0.2135	0.019851	9.357378	0.531274	22.77301	21.24983	0.837325	ZNF502	Ex	Excitatory KneEOA	
rs514986	0.002762	0.3229	396054	4.34E-05	2.993055	0.998915	1.061254	7.02E-12	0.3229	0.015246	6.857342	0.596089	13.5617	14.62295	0.953106	ZNF556	Micro	Microglia KneEOA	
rs6207444	0.01689	0.1536	396054	7.31E-05	2.389094	0.998177	-0.30486	2.85E-22	0.1536	0.02564	7.050831	0.46739	21.69984	21.39498	0.999875	AC124319	Oligo	OligodendrocyteKneEOA	
rs6225909	0.01006	0.2005	396054	5.93E-05	2.57376	0.998521	0.049129	4.86E-11	0.2005	0.020794	6.575131	0.519698	10.86721	10.91634	0.967762	LINC0201	Oligo	OligodendrocyteKneEOA	
rs1991229	0.03781	0.2396	396054	5.21E-05	2.076909	0.998698	-1.16804	5.46E-14	0.2396	0.018296	7.520504	0.551528	15.19571	14.02766	0.804302	LINC0242	Oligo	OligodendrocyteKneEOA	
rs4775006	8.55E-10	0.4271	396054	3.88E-05	6.134402	0.99903	15.3279	0.014362	0.4271	0.013623	2.448084	0.622873	1.378889	16.70679	0.920018	MINDY2	Oligo	OligodendrocyteKneEOA	
rs393329	0.04867	0.4141	396054	3.92E-05	1.971471	0.999022	-1.52362	1.77E-36	0.4141	0.013739	12.61379	0.620881	48.90849	47.38487	0.889287	NPBP2	Oligo	OligodendrocyteKneEOA	
rs683486	0.00462	0.3438	396054	4.21E-05	2.8324	0.998948	0.578287	2.34E-11	0.3438	0.017475	6.682807	0.603617	13.01604	13.59433	0.940543	ST3GAL4	Oligo	OligodendrocyteKneEOA	
rs990027	0.01788	0.4271	396054	3.88E-05	2.368094	0.99903	-0.66809	2.56E-09	0.4271	0.013623	5.957598	0.622873	10.56622	9.898139	0.757591	EMILIN2	OPCs	COFOPOCs/COFKneEOA	
rs9782	0.007782	0.2917	396054	4.60E-05	2.661385	0.998852	0.152596	7.83E-10	0.2917	0.016133	6.1484	0.582398	10.57153	10.72413	0.803401	PAH	OPCs	COFOPOCs/COFKneEOA	
rs914187	0.01894	0.406832	396054	3.94E-05	2.34671	0.999017	-0.71157	7.32E-11	0.406832	0.012869	6.617434	0.636147	13.41171	12.70014	0.940987	BACE2	Sert	SerotonergicKneEOA	
rs10088421	0.024	0.236025	396054	5.27E-05	2.257129	0.998685	-0.77288	1.22E-14	0.236025	0.017223	7.712494	0.566423	14.36318	15.6633	0.998678	HMBOX1	Sert	SerotonergicKneEOA	
rs143384	1.01E-23	0.397516	396054	3.97E-05	10.04046	0.999009	46.8969	0.665644	0.397516	0.012967	0.432134	0.63439	-0.44386	46.45304	0.866443	MMP240S	Sert	SerotonergicKneEOA	
rs8102122	0.03927	0.456522	396054	3.83E-05	2.061346	0.999044	-1.3537	8.08E-18	0.456522	0.012517	8.598413	0.642545	23.23817	21.88447	0.95717	PLP2	Sert	SerotonergicKneEOA	
rs1131017	0.004495	0.381988	396054	4.02E-05	2.841158	0.998995	0.580632	1.97E-87	0.381988	0.013155	19.82085	0.631044	123.4593	124.04	0.811684	RPS26	Sert	SerotonergicKneEOA	
rs1112892	0.01941	0.3698	353388	6.57E-05	2.337562	0.998361	-0.47931	4.01E-28	0.3698	0.014303	10.9956	0.61136	36.48511	36.0058	0.942482	EFHB	Astro	Astrocytes HipOA	
rs2222329	0.000311	0.4766	353388	6.13E-05	3.606044	0.998469	3.250937	2.96E-14	0.4766	0.013363	7.600047	0.627395	17.62576	20.8767	0.867054	NAV3	Astro	Astrocytes HipOA	
rs1220922	1.88E-22	0.09375	353388	0.000018	9.748183	0.995518	44.59674	9.94E-05	0.09375	0.039234	3.892034	0.364469	2.533825	47.13057	0.851698	MYO6	Astro	Astrocytes HipOA	
rs9890200	0.01878	0.3281	353388	6.94E-05	2.349869	0.998268	-0.42303	3.95E-19	0.3281	0.015121	8.938365	0.598077	23.43575	23.01272	0.838107	SPATA20	Astro	Astrocytes HipOA	
rs228965	0.0293	0.397143	353388	6.39E-05	2.179426	0.998405	-0.84923	1.40E-11	0.397143	0.011934	6.577796	0.653432	14.39056	13.54133	0.998942	IGSF22	Da	DopaminergicHipOA	
rs6650495	0.01906	0.471429	353388	6.14E-05	2.344355	0.998467	-0.49656	1.72E-09	0.471429	0.011466	6.022154	0.662427	11.46891	10.97235	0.960869	CHGA	Da	DopaminergicHipOA	
rs4553923	0.04177	0.085714	353388	0.000195	2.055804	0.995143	-0.14044	1.55E-13	0.085714	0.036458	7.382442	0.381625	10.15905	9.557609	0.803016	IFIT2L2	Da	DopaminergicHipOA	
rs1770037	0.03117	0.362857	353388	6.62E-05	2.154896	0.998348	-0.88498	8.68E-09	0.362857	0.012358	5.754724	0.64547	10.16949	9.284503	0.770494	RPL28	Da	DopaminergicHipOA	
rs228965	0.0293	0.42236	353388	6.27E-05	2.179426	0.998435	-0.85856	9.69E-14	0.42236	0.012729	7.445037	0.638673	17.19139	16.33282	0.999517	IGSF22	Da	DopaminergicHipOA	
rs1221009	0.001123	0.326087	353388	6.96E-05	3.257748	0.998262	2.119631	3.64E-14	0.326087	0.014132	7.573146	0.614215	17.13717	19.2568	0.964694	TRIM38	Da	DopaminergicHipOA	
rs6173434	0.007517	0.121118	353388	0.000144	2.673028	0.996419	0.743638	5.06E-10	0.121118</										

rs6184423'	0.03683	0.4531	247455	0.0002	2.087644	0.995027	-0.48355	4.03E-16	0.4531	0.013452	8.137784	0.62584	20.23113	19.74758	0.989145 EFCAB2	Oligo	OligodendrThumbOA
rs908150	0.03499	0.4141	247455	0.000204	2.108474	0.994921	-0.42979	2.67E-20	0.4141	0.013739	9.2315	0.620881	25.97096	25.54117	0.920568 PRKCA	Oligo	OligodendrThumbOA
rs1087768'	0.00522	0.1562	247455	0.000376	2.793134	0.99069	1.526127	5.90E-22	0.1562	0.025291	9.631183	0.470804	21.51764	23.04376	0.993233 FAM19A2	OPCs/COFOPCs/COFThumbOA	
rs3605328:	0.000809	0.4297	247455	0.000202	3.349697	0.994971	2.935723	6.67E-13	0.4297	0.013602	7.186015	0.62323	15.60337	18.5391	0.976738 LINS1	OPCs/COFOPCs/COFThumbOA	
rs6939316	0.000821	0.111429	303782	0.000259	3.345616	0.993555	3.038275	7.70E-18	0.111429	0.028856	8.603932	0.438114	15.92806	18.96633	0.999123 AKAP7	Da	DopaminerHandOA
rs1087686'	0.0105	0.38	303782	0.000109	2.558913	0.997281	0.311314	1.49E-88	0.38	0.012127	19.95041	0.64978	128.7878	129.0991	0.984811 RPS26	Da	DopaminerHandOA
rs6091231	0.003324	0.128571	303782	0.000229	2.936069	0.9943	1.70202	1.24E-12	0.128571	0.025501	7.100748	0.468741	11.50086	13.20288	0.924972 ADNP	Da	DopaminerHandOA
rs8102122	0.01139	0.456522	303782	0.000104	2.5305	0.997418	0.213847	8.08E-18	0.456522	0.012517	8.598413	0.642545	23.23817	23.45202	0.983572 PLPP2	Sert	SerotonergHandOA
rs5590173:	0.0428	0.357143	303782	0.000112	2.025656	0.99721	-0.895	1.54E-17	0.357143	0.013527	8.523996	0.624539	22.19924	21.30423	0.981114 GFPT2	Sert	SerotonergHandOA
rs3759453	0.03727	0.3724	303782	0.00011	2.082794	0.997259	-0.78673	1.20E-40	0.3724	0.014262	13.34873	0.612042	54.05599	53.26925	0.995472 LINC0044	Ex	Excitatory HandOA
rs3759453	0.03727	0.3724	303782	0.00011	2.082794	0.997259	-0.78673	9.46E-33	0.3724	0.014262	11.91868	0.612042	42.99835	42.21162	0.987161 LINC0055	Ex	Excitatory HandOA
rs2286569	0.0636	0.4974	303782	0.000103	1.854974	0.997437	-1.26732	7.94E-54	0.4974	0.013334	15.44667	0.627901	74.41412	73.1468	0.894379 CYB561	Ex	Excitatory HandOA
rs9782	0.0332	0.2917	303782	0.000124	2.129656	0.996901	-0.62766	7.12E-21	0.2917	0.016133	9.371969	0.582398	25.14051	24.51285	0.84083 PAH	Ex	Excitatory HandOA
rs9782	0.0332	0.2917	303782	0.000124	2.129656	0.996901	-0.62766	1.90E-17	0.2917	0.016133	8.499884	0.582398	20.60194	19.97429	0.904995 PAH	In	Inhibitory rHandOA
rs1124968:	0.02274	0.4453	303782	0.000104	2.277775	0.997407	-0.38998	5.26E-25	0.4453	0.013495	10.32808	0.62509	32.84835	32.45836	0.844884 FAM153A	In	Inhibitory rHandOA
rs908150	0.009905	0.4141	303782	0.000106	2.579128	0.99736	0.348723	2.67E-20	0.4141	0.013739	9.2315	0.620881	25.97096	26.31968	0.855187 PRKCA	Oligo	OligodendrHandOA
rs1087768'	0.01713	0.1562	303782	0.000195	2.383906	0.995151	0.163269	5.90E-22	0.1562	0.025291	9.631183	0.470804	21.51764	21.6809	0.998686 FAM19A2	OPCs/COFOPCs/COFHandOA	
rs8077755	0.005656	0.2057	303782	0.000157	2.767085	0.996084	1.041991	1.28E-09	0.2057	0.020401	6.069441	0.524458	9.288381	10.33037	0.793519 CACNA1C	OPCs/COFOPCs/COFHandOA	
rs9782	0.0332	0.2917	303782	0.000124	2.129656	0.996901	-0.62766	7.83E-10	0.2917	0.016133	6.1484	0.582398	10.57153	9.943878	0.763065 PAH	OPCs/COFOPCs/COFHandOA	
rs6939316	0.000264	0.111429	266618	0.000487	3.648769	0.987962	4.366796	7.70E-18	0.111429	0.028856	8.603932	0.438114	15.92806	20.29485	0.998933 AKAP7	Da	DopaminerFingerOA
rs1005176:	0.04795	0.328571	266618	0.000219	1.977811	0.994561	-0.66185	3.08E-33	0.328571	0.012951	12.01178	0.634679	45.28322	44.62138	0.940697 RGS14	Da	DopaminerFingerOA
rs6650495	0.03548	0.471429	266618	0.000194	2.102837	0.995182	-0.46735	1.72E-09	0.471429	0.011466	6.022154	0.662427	11.46891	11.00157	0.887664 CHGA	Da	DopaminerFingerOA
rs8963	0.04946	0.194286	266618	0.000308	1.964605	0.992352	-0.52156	3.39E-14	0.194286	0.018252	7.582321	0.55212	15.46952	14.94796	0.82173 UBC	Da	DopaminerFingerOA
rs8135371	0.002149	0.114286	266618	0.000477	3.068828	0.988222	2.43265	4.29E-13	0.114286	0.028226	7.24596	0.443561	11.35125	13.78391	0.807142 ADSL	Da	DopaminerFingerOA
rs1221026:	0.02863	0.493789	266618	0.000193	2.188544	0.995197	-0.28585	3.28E-17	0.493789	0.012424	8.436021	0.644251	22.40776	22.12191	0.998493 MPC1	Sert	SerotonergFingerOA
rs1043207	0.02984	0.263975	266618	0.000248	2.172208	0.993829	-0.19924	3.79E-22	0.263975	0.015984	9.676537	0.584657	26.93295	26.73371	0.992827 RBM23	Sert	SerotonergFingerOA
rs1083167:	0.01794	0.4869	266618	0.000193	2.366854	0.995194	0.118596	3.75E-14	0.4869	0.013342	7.569323	0.627747	17.48917	17.60777	0.940936 USP47	Ex	Excitatory FingerOA
rs2286569	0.01303	0.4974	266618	0.000193	2.482948	0.995197	0.398441	7.94E-54	0.4974	0.013334	15.44667	0.627901	74.41412	74.81256	0.908119 CYB561	Ex	Excitatory FingerOA
rs1493280:	8.14E-06	0.1016	266618	0.000529	4.461416	0.986955	7.652623	1.00E-06	0.1016	0.036519	4.891237	0.381235	4.320358	11.97298	0.843271 FAM153B	Ex	Excitatory FingerOA
rs7928622	0.00034	0.3073	266618	0.000227	3.582901	0.994364	3.793109	6.36E-14	0.3073	0.015659	7.500545	0.589634	16.14052	19.93363	0.803499 GALNT18	Ex	Excitatory FingerOA
rs5639124	0.04216	0.4714	266618	0.000194	2.031937	0.995182	-0.61322	4.23E-49	0.4714	0.013377	14.72844	0.627141	67.52863	66.91542	0.996789 FAM221A	Oligo	OligodendrFingerOA
rs5639124	0.04216	0.4714	266618	0.000194	2.031937	0.995182	-0.61322	7.49E-30	0.4714	0.013377	11.34918	0.627141	39.89579	39.28258	0.990704 STK31	Oligo	OligodendrFingerOA