

Supplementary Table 8. Significant Causal Proteins Implicated in Various Forms of OA Identified by PWAS

ID	Protein	CHR	P0	P1	HSQ	BEST.GW.	BEST.GW.EQTL.ID	EQTL.R2	EQTL.Z	EQTL.GWNSNP	NWGT	MODEL	MODEL.C	MODEL.C.TWAS.Z	TWAS.P	Datasets	OA.Type	FDR	
ENSG00000AARS		16	70286198	70323446	0.0805	rs4985407	-4.8	rs4985407	0.141186	-5.26	-4.796	15	2 lasso	0.15	7.2E-07	4.8131	1.49E-06 Banner	KneeOA	8.046E-05
ENSG00000CPNE1		20	34213953	34252878	0.691	rs224430	-7.51	rs11696527	0.5822	-9.42	-4.12	74	3 lasso	0.59	3E-31	4.646	3.39E-06 Banner	KneeOA	8.136E-05
ENSG00000ICA1L		2	203640690	203736708	0.3189	rs6725887	-4.11	rs6705330	0.089652	5.48	-4.031	77	10 enet	0.15	6.4E-07	-4.419	9.92E-06 Banner	KneeOA	0.0008234
ENSG00000LEMD2		6	33738979	33756913	0.159	rs3828783	-3.93	rs755495	0.123	4.45	-3.772	196	1 top1	0.12	0.000031	-3.772	0.000162 Banner	KneeOA	0.001296
ENSG00000DGKE		17	54911460	54946036	0.0692	rs1467246	4.837	rs11651695	0.034371	-3.76	4.179	94	7 lasso	0.054	0.0024	-4.2525	0.0000211 Banner	KneeOA	0.0015403
ENSG00000DOC2A		16	30016830	30034591	0.0664	rs12716972	-5.16	rs35105141	0.053619	4.16	4.021	75	1 top1	0.054	0.0024	4.021	0.000058 Banner	KneeOA	0.001566
ENSG00000ASPHD1		16	29911696	29931185	0.5621	rs12716972	-5.16	rs4787483	0.138983	4.79	2.278	66	22 enet	0.28	1.9E-12	3.8779	0.000105 Banner	KneeOA	0.00189
ENSG00000EIF5B		2	99953816	100017789	0.2501	rs6715321	5.38	rs2305354	0.122761	4.85	-3.885	87	1 top1	0.12	0.0000057	-3.885	0.000102 Banner	KneeOA	0.004233
ENSG00000PSMB9		6	32811913	32827362	0.149	rs2071469	-3.79	rs17587	0.0896	-3.84	3.222	121	1 top1	0.09	0.00011	-3.222	0.001273 Banner	KneeOA	0.0048827
ENSG00000C4A		6	31949801	31970458	0.258	rs1150752	3.61	rs1150754	0.1262	-5.48	2.102	57	13 enet	0.22	7.7E-10	-3.1163	0.001831 Banner	KneeOA	0.0048827
ENSG00000EMILIN2		18	2847028	2915991	0.1569	rs11664521	-3.57	rs11664521	0.00835	-3.6	-3.566	103	1 top1	0.0084	0.13	3.566	0.000362 Banner	KneeOA	0.005068
ENSG00000MRGPRF		11	68771863	68780877	0.4473	rs4244843	3.96	rs2846196	0.41952	7.26	-3.694	93	1 top1	0.42	2E-16	-3.694	0.000221 Banner	KneeOA	0.008619
ENSG00000PANX1		11	93862094	93915138	0.4073	rs12419615	2.92	rs11607757	0.138899	-4.75	2.8	76	76 blup	0.15	3.7E-07	-3.7646	0.000167 Banner	KneeOA	0.008619
ENSG00000LYRM2		6	90277863	90348472	0.6419	rs715203	-4.19	rs34012596	0.4694	-8.05	-3.785	82	48 enet	0.49	4.8E-22	3.6897	0.000225 Banner	KneeOA	0.014175
ENSG00000NT5C3B		17	39981335	39992523	0.3122	rs8072866	3.994	rs4796714	0.394567	7.79	3.547	93	1 top1	0.39	2.8E-18	3.547	0.00039 Banner	KneeOA	0.014235
ENSG00000THEM6		8	143808621	143818345	0.187	rs2717611	4.24	rs3758083	0.00395	3.66	1.051	93	93 blup	0.064	0.00094	3.5701	0.000357 Banner	KneeOA	0.015351
ENSG00000C5orf51		5	41904290	41921738	0.0737	rs4957436	3.3	rs10064298	0.039033	-2.93	3.09	47	47 bsllmm	0.053	0.0024	-3.2686	0.00108 Banner	KneeOA	0.018225
ENSG00000CWC27		5	64064757	64314590	0.126	rs11738728	-4.69	rs1433609	0.189512	5.34	3.152	144	1 top1	0.19	2.7E-08	3.152	0.00162 Banner	KneeOA	0.018225
ENSG00000LPCAT1		5	1456595	1524092	0.1365	rs7737692	-3.21	rs7737692	0.055564	-4.02	-3.207	133	3 lasso	0.073	0.00045	3.266	0.00109 Banner	KneeOA	0.018225
ENSG00000CYSTM1		5	139554227	139661637	0.1287	rs1432874	-3.67	rs269782	0.235932	-6.14	3.211	72	1 top1	0.24	1.4E-10	-3.211	0.00132 Banner	KneeOA	0.018225
ENSG00000KHK		2	27309615	27323640	0.2274	rs7560144	-3.46	rs2384572	0.281954	-7.59	-3.421	60	25 enet	0.32	7.2E-14	3.317	0.00091 Banner	KneeOA	0.0191315
ENSG00000DPYSL5		2	27070615	27173219	0.168	rs10181777	-3.95	rs4513249	0.121882	-4.91	-2.945	82	14 enet	0.16	2.4E-07	3.3135	0.000922 Banner	KneeOA	0.0191315
ENSG00000ULK3		15	75128457	75135687	0.4718	rs11630918	4.06	rs936227	0.46969	8.48	-3.372	60	10 lasso	0.47	1.2E-22	-3.4433	0.000575 Banner	KneeOA	0.024725
ENSG00000ADO		10	64564516	64568238	0.2686	rs1848797	3.82	rs1848797	0.38402	-8.16	3.821	88	15 enet	0.4	1.4E-18	-3.3831	0.000717 Banner	KneeOA	0.038001
ENSG00000MPI		15	75182346	75191798	0.1538	rs3812945	4.39	rs11072512	0.22182	-5.85	-3.126	58	1 top1	0.22	5.5E-10	3.126	0.001772 Banner	KneeOA	0.038098
ENSG00000G6PC3		17	42148103	42153709	0.172	rs228768	4.039	rs2523166	0.118168	4.48	3.15	71	1 top1	0.12	0.0000086	3.15	0.00163 Banner	KneeOA	0.0396633
ENSG00000AAK1		2	69688532	69901481	0.0855	rs12151791	3.73	rs6725791	0.012355	-3.69	3.589	115	9 enet	0.05	0.0033	-2.9719	0.00296 Banner	KneeOA	0.0409467
ENSG00000NFU1		2	69622882	69664760	0.1376	rs11126231	4.34	rs11690738	0.03179	3.95	3.416	92	92 bsllmm	0.073	0.00045	3.0103	0.00261 Banner	KneeOA	0.0409467
ENSG00000GSTP1		11	67351066	67354131	0.4077	rs7941395	-3	rs1695	0.534246	-9.13	-2.992	65	29 enet	0.57	2.3E-29	3.1538	0.001612 Banner	KneeOA	0.041912
ENSG00000TRIM47		17	73870242	73874656	0.1289	rs1551619	3.41	rs9894383	0.12097	-5.38	2.711	57	4 lasso	0.17	2.3E-07	-3.0124	0.00259 Banner	KneeOA	0.0472675
ENSG00000DGKE		17	54911460	54946036	0.0692	rs11651695	6.23	rs11651695	0.034371	-3.76	6.234	94	7 lasso	0.054	0.0024	-5.9856	2.16E-09 Banner	HipOA	1.577E-07
ENSG00000TRIM25		17	54965270	54991399	0.1985	rs11658180	-5.54	rs6503772	0.086453	4.2	-5.279	72	14 enet	0.17	5.7E-08	-4.4303	9.41E-06 Banner	HipOA	0.0003435
ENSG00000TWF2		3	52262626	52273276	0.1018	rs3852064	5.91	rs352143	0.03835	-3.84	-2.884	73	6 lasso	0.067	0.00074	4.05016	0.0000512 Banner	HipOA	0.004096
ENSG00000CCS		11	66360292	66373490	0.0864	rs3819247	5.01	rs2275998	0.10803	-4.55	3.873	63	1 top1	0.11	0.000021	-3.873	0.000108 Banner	HipOA	0.008424
ENSG00000PSMF1		20	1093906	1160596	0.1078	rs6039805	-3.46	rs6514113	0.1002	-4.31	-3.364	115	1 top1	0.1	0.000042	3.364	0.000768 Banner	HipOA	0.018432
ENSG00000MANF		3	51422478	51426828	0.0895	rs2127655	3.62	rs1552074	0.10153	-4.75	3.419	43	1 top1	0.1	0.000052	-3.419	0.000629 Banner	HipOA	0.0199733
ENSG00000TEX264		3	51696709	51738339	0.0873	rs4067	3.43	rs11919197	0.0303	3.27	3.371	15	1 top1	0.03	0.018	3.371	0.000749 Banner	HipOA	0.0199733
ENSG00000SPATA20		17	48620419	48633213	0.6772	rs8068726	3.22	rs28498091	0.318812	-8.21	2.659	98	4 lasso	0.63	4.3E-34	-3.3083	0.000939 Banner	HipOA	0.022849
ENSG00000IST1		16	71879899	71962913	0.2516	rs9929256	2.95	rs7198834	0.149731	-4.94	-1.478	112	112 bsllmm	0.19	1.8E-08	3.4816	0.000498 Banner	HipOA	0.025893
ENSG00000ACSF3		16	89154783	89222254	0.5948	rs1054747	-3.41	rs1054747	0.19154	-5.43	-3.408	70	70 bsllmm	0.34	2.2E-15	3.3024	0.000959 Banner	HipOA	0.025893
ENSG00000C14orf159		14	91526677	91691976	0.7756	rs4904753	-3.75	rs4900071	0.73802	-10.59	-3.402	92	1 top1	0.74	1.1E-45	3.402	0.000669 Banner	HipOA	0.028767
ENSG00000MTRR		5	7851299	7906138	0.2508	rs7728958	3.02	rs162037	0.063197	4.08	1.776	151	151 bsllmm	0.13	0.00012	3.3351	0.000853 Banner	HipOA	0.038385
ENSG00000PIP4K2A		10	22823778	23003484	0.4662	rs10047326	4.49	rs12355895	0.38255	-8.13	3.183	122	7 lasso	0.4	9.7E-19	-3.3415	0.000833 Banner	HipOA	0.044149
ENSG00000ADO		10	64564516	64568238	0.2686	rs1848797	3.26	rs1848797	0.38402	-8.16	3.264	88	15 enet	0.4	1.4E-18	-3.1239	0.001785 Banner	HipOA	0.0473025
ENSG00000GMPPB		3	49754277	49761384	0.3324	rs6785549	4.21	rs6809879	0.29967	7.03	4.018	78	1 top1	0.3	1.8E-13	4.018	0.0000587 Banner	SpineOA	0.004696
ENSG00000GPX1		3	49394609	49396033	0.5271	rs17080528	-3.76	rs17080528	0.57204	-9.4	-3.76	50	1 top1	0.57	1.2E-29	3.76	0.00017 Banner	SpineOA	0.0068
ENSG00000EMILIN2		18	2847028	2915991	0.1569	rs11664521	-3.39	rs11664521	0.00835	-3.6	-3.389	103	1 top1	0.0084	0.13	3.389	0.000701 Banner	SpineOA	0.009814
ENSG00000TWF2		3	52262626	52273276	0.1018	rs13059674	-3.52	rs352143	0.03835	-3.84	-3.508	73	6 lasso	0.067	0.00074	3.539	0.000402 Banner	SpineOA	0.01072
ENSG00000RP11-216L		9	139685831	139695047	0.1535	rs11145887	-3.561	rs11145887	0.132914	4.89	-3.561	70	8 lasso	0.2	2.6E-08	-3.6078	0.000309 Banner	SpineOA	0.018849
ENSG00000AARS		16	70286198	70323446	0.0805	rs4985407	-3.545	rs4985407	0.141186	-5.26	-3.545	15	2 lasso	0.15	7.2E-07	3.5091	0.00045 Banner	SpineOA	0.0243
ENSG00000PACSIN2		22	43231418	434															

ENSG000001POGLUT1	3	119187785	119213555	0.2445	rs7653123	4.571	rs7653123	0.07748	4.51	4.571	127	127	bslmm	0.22	1.9E-09	3.5201	0.000431	Banner	FingerOA	0.03448
ENSG000001ADSL	22	40742507	40786467	0.1683	rs8135371	3.07	rs8135371	0.138128	4.83	3.069	59	1	top1	0.14	0.0000014	3.069	0.002148	Banner	FingerOA	0.035442
ENSG000001FNBP1	9	132649466	132805473	0.0987	rs913316	3.61	rs4240438	0.082525	4.22	3.387	136	1	top1	0.083	0.0002	3.387	0.000707	Banner	FingerOA	0.043127
ENSG000001DGKE	17	54911460	54946036	0.0692	rs17822403	4.3	rs11651695	0.034371	-3.76	4.057	94	7	lasso	0.054	0.0024	-4.086269	0.0000438	Banner	HandOA	0.0031974
ENSG000001GNPDA1	5	141371314	141392606	0.2585	rs164080	-3.91	rs164080	0.126831	-4.68	-3.908	119	1	top1	0.13	0.000004	3.908	0.0000931	Banner	HandOA	0.0041895
ENSG000001HLA-DRB1	6	32546546	32557625	0.256	rs17843604	-3.57	rs674313	0.0953	-4.11	-0.242	23	23	bslmm	0.11	0.000027	2.932	0.00337	Banner	HandOA	0.02696
ENSG000001SNAP47	1	227916240	227968927	0.129	rs10916199	5.583	rs6683869	0.054674	-5.02	4.592	90	90	bslmm	0.12	0.0000064	-5.0296	4.91E-07	Banner	ThumbOA	5.647E-05
ENSG000001TAPT1	4	16162128	16229033	0.0853	rs6812660	-3.503	rs1025897	0.0697	3.87	-3.376	134	1	top1	0.07	0.00059	-3.376	0.000735	Banner	ThumbOA	0.03234
ENSG000001MX1	21	42792231	42831141	0.212	rs459498	-2.95	rs6517666	0.174447	-5.36	-2.22	137	137	bslmm	0.21	1.7E-09	2.899	0.00375	Banner	ThumbOA	0.045