

Table 16. Identification of pleiotropic genes using proteome-wide association studies

Locus No.	Gene	GENE	CHR	START	STOP	P.magma	Trait	PWAS.Z	PWAS.P	P.adjusted
150	APOC1	341	19	45412577	45427606	1.91E-06	Asthma	-1.4620	1.44E-01	3.10E-01
150	APOC1	341	19	45412577	45427606	1.91E-06	COPD	-1.6306	1.03E-01	2.55E-01
150	APOC1	341	19	45412577	45427606	1.91E-06	IPF	1.0344	3.01E-01	5.47E-01
150	APOC1	341	19	45412577	45427606	1.91E-06	LungCancer	0.9865	3.24E-01	5.65E-01
150	APOC1	341	19	45412577	45427606	1.91E-06	Snoring	-3.9882	6.66E-05	6.61E-04
150	APOE	348	19	45404039	45417650	3.30E-05	Asthma	-2.0147	4.39E-02	1.44E-01
150	APOE	348	19	45404039	45417650	3.30E-05	COPD	-1.7577	7.88E-02	2.08E-01
150	APOE	348	19	45404039	45417650	3.30E-05	IPF	-0.7665	4.43E-01	6.57E-01
150	APOE	348	19	45404039	45417650	3.30E-05	LungCancer	-0.4392	6.61E-01	8.20E-01
150	APOE	348	19	45404039	45417650	3.30E-05	Snoring	-2.9244	3.45E-03	1.94E-02
71	AZGP1	563	7	99559350	99578735	2.92E-06	Asthma	0.6883	4.91E-01	7.08E-01
71	AZGP1	563	7	99559350	99578735	2.92E-06	COPD	-1.5559	1.20E-01	2.89E-01
71	AZGP1	563	7	99559350	99578735	2.92E-06	IPF	0.8534	3.93E-01	6.19E-01
71	AZGP1	563	7	99559350	99578735	2.92E-06	LungCancer	-0.3362	7.37E-01	8.69E-01
71	AZGP1	563	7	99559350	99578735	2.92E-06	Snoring	0.4138	6.79E-01	8.34E-01
156	CCDC134	79879	22	42191636	42233175	4.97E-11	Asthma	0.1944	8.46E-01	9.20E-01
156	CCDC134	79879	22	42191636	42233175	4.97E-11	COPD	0.7956	4.26E-01	6.39E-01
156	CCDC134	79879	22	42191636	42233175	4.97E-11	IPF	0.5182	6.04E-01	7.80E-01
156	CCDC134	79879	22	42191636	42233175	4.97E-11	LungCancer	-0.1527	8.79E-01	9.34E-01
156	CCDC134	79879	22	42191636	42233175	4.97E-11	Snoring	1.4109	1.58E-01	3.35E-01
86	CNTFR	1271	9	34546425	34595713	1.48E-05	Asthma	3.5130	4.43E-04	3.17E-03
86	CNTFR	1271	9	34546425	34595713	1.48E-05	COPD	2.5458	1.09E-02	4.69E-02
86	CNTFR	1271	9	34546425	34595713	1.48E-05	IPF	1.4745	1.40E-01	3.10E-01
86	CNTFR	1271	9	34546425	34595713	1.48E-05	LungCancer	-1.0717	2.84E-01	5.23E-01
86	CNTFR	1271	9	34546425	34595713	1.48E-05	Snoring	-2.1866	2.88E-02	1.09E-01
104	ERBB3	2065	12	56468809	56502291	6.51E-12	Asthma	-3.4645	5.31E-04	3.61E-03
104	ERBB3	2065	12	56468809	56502291	6.51E-12	COPD	-0.3310	7.41E-01	8.69E-01
104	ERBB3	2065	12	56468809	56502291	6.51E-12	IPF	0.6099	5.42E-01	7.28E-01
104	ERBB3	2065	12	56468809	56502291	6.51E-12	LungCancer	NA	NA	NA
104	ERBB3	2065	12	56468809	56502291	6.51E-12	Snoring	1.5136	1.30E-01	2.99E-01
123	FGF7	2252	15	49710375	49784523	3.77E-06	Asthma	-4.6997	2.60E-06	3.73E-05
123	FGF7	2252	15	49710375	49784523	3.77E-06	COPD	-2.0838	3.72E-02	1.33E-01
123	FGF7	2252	15	49710375	49784523	3.77E-06	IPF	-1.8685	6.17E-02	1.77E-01
123	FGF7	2252	15	49710375	49784523	3.77E-06	LungCancer	-0.1908	8.49E-01	9.20E-01
123	FGF7	2252	15	49710375	49784523	3.77E-06	Snoring	-2.0025	4.52E-02	1.44E-01
138	HEXIM1	10614	17	43219684	43234468	3.07E-07	Asthma	5.2235	1.76E-07	3.24E-06
138	HEXIM1	10614	17	43219684	43234468	3.07E-07	COPD	3.4465	5.68E-04	3.66E-03
138	HEXIM1	10614	17	43219684	43234468	3.07E-07	IPF	0.2283	8.19E-01	9.03E-01
138	HEXIM1	10614	17	43219684	43234468	3.07E-07	LungCancer	0.0450	9.64E-01	9.72E-01
138	HEXIM1	10614	17	43219684	43234468	3.07E-07	Snoring	-1.5297	1.26E-01	2.96E-01
86	IL11RA	3590	9	34647182	34666899	5.29E-05	Asthma	-2.7105	6.72E-03	3.33E-02
86	IL11RA	3590	9	34647182	34666899	5.29E-05	COPD	-2.7763	5.50E-03	2.96E-02
86	IL11RA	3590	9	34647182	34666899	5.29E-05	IPF	-1.2097	2.26E-01	4.36E-01
86	IL11RA	3590	9	34647182	34666899	5.29E-05	LungCancer	0.8258	4.09E-01	6.36E-01
86	IL11RA	3590	9	34647182	34666899	5.29E-05	Snoring	-0.2955	7.68E-01	8.72E-01
17	IL1R1	3554	2	1.03E+08	1.03E+08	2.30E-16	Asthma	4.3086	1.64E-05	1.76E-04
17	IL1R1	3554	2	1.03E+08	1.03E+08	2.30E-16	COPD	0.6247	5.32E-01	7.23E-01
17	IL1R1	3554	2	1.03E+08	1.03E+08	2.30E-16	IPF	-0.3112	7.56E-01	8.72E-01
17	IL1R1	3554	2	1.03E+08	1.03E+08	2.30E-16	LungCancer	1.7559	7.91E-02	2.08E-01
17	IL1R1	3554	2	1.03E+08	1.03E+08	2.30E-16	Snoring	1.9928	4.63E-02	1.44E-01
17	IL1RL2	8808	2	1.03E+08	1.03E+08	6.73E-13	Asthma	-6.0683	1.29E-09	5.55E-08
17	IL1RL2	8808	2	1.03E+08	1.03E+08	6.73E-13	COPD	2.0986	3.59E-02	1.32E-01
17	IL1RL2	8808	2	1.03E+08	1.03E+08	6.73E-13	IPF	-0.2917	7.71E-01	8.72E-01
17	IL1RL2	8808	2	1.03E+08	1.03E+08	6.73E-13	LungCancer	-1.3679	1.71E-01	3.47E-01
17	IL1RL2	8808	2	1.03E+08	1.03E+08	6.73E-13	Snoring	-2.6968	7.00E-03	3.34E-02
44	IL7R	3575	5	35851977	35884705	1.79E-05	Asthma	5.0306	4.89E-07	7.89E-06
44	IL7R	3575	5	35851977	35884705	1.79E-05	COPD	1.9927	4.63E-02	1.44E-01
44	IL7R	3575	5	35851977	35884705	1.79E-05	IPF	-0.3642	7.16E-01	8.55E-01

44	IL7R	3575	5	35851977	35884705	1.79E-05	LungCancer	-0.9241	3.55E-01	6.03E-01
44	IL7R	3575	5	35851977	35884705	1.79E-05	Snoring	1.0075	3.14E-01	5.62E-01
54	LMAN2	10960	5	1.77E+08	1.77E+08	1.58E-07	Asthma	2.7182	6.56E-03	3.33E-02
54	LMAN2	10960	5	1.77E+08	1.77E+08	1.58E-07	COPD	3.5322	4.12E-04	3.13E-03
54	LMAN2	10960	5	1.77E+08	1.77E+08	1.58E-07	IPF	0.9908	3.22E-01	5.65E-01
54	LMAN2	10960	5	1.77E+08	1.77E+08	1.58E-07	LungCancer	-1.3962	1.63E-01	3.38E-01
54	LMAN2	10960	5	1.77E+08	1.77E+08	1.58E-07	Snoring	-0.0064	9.95E-01	9.95E-01
98	LRRC32	2615	11	76363568	76386990	8.52E-07	Asthma	0.4950	6.21E-01	7.83E-01
98	LRRC32	2615	11	76363568	76386990	8.52E-07	COPD	0.3643	7.16E-01	8.55E-01
98	LRRC32	2615	11	76363568	76386990	8.52E-07	IPF	0.0910	9.27E-01	9.42E-01
98	LRRC32	2615	11	76363568	76386990	8.52E-07	LungCancer	0.8863	3.75E-01	6.12E-01
98	LRRC32	2615	11	76363568	76386990	8.52E-07	Snoring	-0.6502	5.16E-01	7.20E-01
131	MAPK3	5595	16	30120426	30139630	4.20E-06	Asthma	-4.6432	3.43E-06	4.42E-05
131	MAPK3	5595	16	30120426	30139630	4.20E-06	COPD	-4.4527	8.48E-06	9.94E-05
131	MAPK3	5595	16	30120426	30139630	4.20E-06	IPF	-0.6756	4.99E-01	7.08E-01
131	MAPK3	5595	16	30120426	30139630	4.20E-06	LungCancer	-0.5614	5.75E-01	7.64E-01
131	MAPK3	5595	16	30120426	30139630	4.20E-06	Snoring	-3.5773	3.47E-04	2.80E-03
38	NPNT	255743	4	1.07E+08	1.07E+08	1.24E-05	Asthma	-7.4928	6.74E-14	7.35E-12
38	NPNT	255743	4	1.07E+08	1.07E+08	1.24E-05	COPD	-5.6500	1.60E-08	5.16E-07
38	NPNT	255743	4	1.07E+08	1.07E+08	1.24E-05	IPF	0.3065	7.59E-01	8.72E-01
38	NPNT	255743	4	1.07E+08	1.07E+08	1.24E-05	LungCancer	-1.2385	2.16E-01	4.21E-01
38	NPNT	255743	4	1.07E+08	1.07E+08	1.24E-05	Snoring	0.8019	4.23E-01	6.39E-01
84	PCD1LG2	80380	9	5505512	5576282	4.63E-05	Asthma	2.4326	1.50E-02	6.24E-02
84	PCD1LG2	80380	9	5505512	5576282	4.63E-05	COPD	1.4781	1.39E-01	3.10E-01
84	PCD1LG2	80380	9	5505512	5576282	4.63E-05	IPF	0.6778	4.98E-01	7.08E-01
84	PCD1LG2	80380	9	5505512	5576282	4.63E-05	LungCancer	0.6310	5.28E-01	7.23E-01
84	PCD1LG2	80380	9	5505512	5576282	4.63E-05	Snoring	-0.9134	3.61E-01	6.05E-01
2	PEX14	5195	1	10530003	10695815	1.36E-05	Asthma	2.6352	8.41E-03	3.87E-02
2	PEX14	5195	1	10530003	10695815	1.36E-05	COPD	-1.6432	1.00E-01	2.53E-01
2	PEX14	5195	1	10530003	10695815	1.36E-05	IPF	0.2523	8.01E-01	8.98E-01
2	PEX14	5195	1	10530003	10695815	1.36E-05	LungCancer	-1.9863	4.70E-02	1.44E-01
2	PEX14	5195	1	10530003	10695815	1.36E-05	Snoring	-1.8681	6.18E-02	1.77E-01
108	PLXNC1	10154	12	94537499	94706451	1.87E-09	Asthma	0.1549	8.77E-01	9.34E-01
108	PLXNC1	10154	12	94537499	94706451	1.87E-09	COPD	0.8735	3.82E-01	6.12E-01
108	PLXNC1	10154	12	94537499	94706451	1.87E-09	IPF	-0.3941	6.93E-01	8.44E-01
108	PLXNC1	10154	12	94537499	94706451	1.87E-09	LungCancer	0.8005	4.23E-01	6.39E-01
108	PLXNC1	10154	12	94537499	94706451	1.87E-09	Snoring	1.4611	1.44E-01	3.10E-01
131	PRSS8	5652	16	31137754	31152151	4.65E-08	Asthma	5.6020	2.12E-08	5.47E-07
131	PRSS8	5652	16	31137754	31152151	4.65E-08	COPD	3.8268	1.30E-04	1.12E-03
131	PRSS8	5652	16	31137754	31152151	4.65E-08	IPF	0.4881	6.25E-01	7.83E-01
131	PRSS8	5652	16	31137754	31152151	4.65E-08	LungCancer	1.9669	4.92E-02	1.48E-01
131	PRSS8	5652	16	31137754	31152151	4.65E-08	Snoring	5.3477	8.91E-08	1.92E-06
59	PTK7	5754	6	43039006	43134458	3.73E-06	Asthma	3.1530	1.62E-03	9.95E-03
59	PTK7	5754	6	43039006	43134458	3.73E-06	COPD	1.8436	6.52E-02	1.83E-01
59	PTK7	5754	6	43039006	43134458	3.73E-06	IPF	0.2437	8.07E-01	8.98E-01
59	PTK7	5754	6	43039006	43134458	3.73E-06	LungCancer	-0.6452	5.19E-01	7.20E-01
59	PTK7	5754	6	43039006	43134458	3.73E-06	Snoring	0.1245	9.01E-01	9.37E-01
135	SAT2	112483	17	7524552	7536194	3.30E-05	Asthma	1.1057	2.69E-01	5.03E-01
135	SAT2	112483	17	7524552	7536194	3.30E-05	COPD	2.0145	4.40E-02	1.44E-01
135	SAT2	112483	17	7524552	7536194	3.30E-05	IPF	-0.0991	9.21E-01	9.42E-01
135	SAT2	112483	17	7524552	7536194	3.30E-05	LungCancer	-2.5997	9.33E-03	4.15E-02
135	SAT2	112483	17	7524552	7536194	3.30E-05	Snoring	1.1840	2.36E-01	4.48E-01
135	SHBG	6462	17	7512382	7541700	1.43E-05	Asthma	-0.8831	3.77E-01	6.12E-01
135	SHBG	6462	17	7512382	7541700	1.43E-05	COPD	-0.1464	8.84E-01	9.34E-01
135	SHBG	6462	17	7512382	7541700	1.43E-05	IPF	-0.5037	6.14E-01	7.83E-01
135	SHBG	6462	17	7512382	7541700	1.43E-05	LungCancer	-1.7711	7.65E-02	2.08E-01
135	SHBG	6462	17	7512382	7541700	1.43E-05	Snoring	-2.2434	2.49E-02	9.73E-02
34	TLR1	7096	4	38792876	38811814	3.34E-13	Asthma	-7.4238	1.14E-13	7.35E-12
34	TLR1	7096	4	38792876	38811814	3.34E-13	COPD	-0.6825	4.95E-01	7.08E-01
34	TLR1	7096	4	38792876	38811814	3.34E-13	IPF	0.9722	3.31E-01	5.69E-01

34	TLR1	7096	4	38792876	38811814	3.34E-13	LungCancer	-1.5511	1.21E-01	2.89E-01
34	TLR1	7096	4	38792876	38811814	3.34E-13	Snoring	0.5524	5.81E-01	7.64E-01
48	TNFAIP8	25816	5	1.19E+08	1.19E+08	3.65E-05	Asthma	-1.2950	1.95E-01	3.87E-01
48	TNFAIP8	25816	5	1.19E+08	1.19E+08	3.65E-05	COPD	-0.8700	3.84E-01	6.12E-01
48	TNFAIP8	25816	5	1.19E+08	1.19E+08	3.65E-05	IPF	2.3042	2.12E-02	8.55E-02
48	TNFAIP8	25816	5	1.19E+08	1.19E+08	3.65E-05	LungCancer	-0.1194	9.05E-01	9.37E-01
48	TNFAIP8	25816	5	1.19E+08	1.19E+08	3.65E-05	Snoring	-1.7250	8.45E-02	2.18E-01
135	TNFSF12	8742	17	7447375	7466207	1.02E-06	Asthma	-3.8770	1.06E-04	9.77E-04
135	TNFSF12	8742	17	7447375	7466207	1.02E-06	COPD	0.1158	9.08E-01	9.37E-01
135	TNFSF12	8742	17	7447375	7466207	1.02E-06	IPF	-0.5344	5.93E-01	7.73E-01
135	TNFSF12	8742	17	7447375	7466207	1.02E-06	LungCancer	-1.3650	1.72E-01	3.47E-01
135	TNFSF12	8742	17	7447375	7466207	1.02E-06	Snoring	-3.1083	1.88E-03	1.10E-02