

Table S1 Overview of the source of erectile dysfunction data

GWAS ID	Trait	Data Source	Cases	Controls	Population
ebi-a-GCST006956	Erectile dysfunction	Bovijn J	6,175	217,630	European

GWAS, genome-wide association studies.

Table S2 104 SNPs for the 179 plasma lipidome

No.	SNP	EA	OA	$\beta$	SE	pval	Sample	ID	gut microbes taxa
1	rs1042034	T	C	0.102639	0.018599	3.54E-08	7173	GCST90277256	Ceramide (d42:2) levels
2	rs11507232	A	G	0.126578	0.0286346	9.99E-06	7173	GCST90277256	Ceramide (d42:2) levels
3	rs116327692	T	C	0.346637	0.0715174	1.28E-06	7173	GCST90277256	Ceramide (d42:2) levels
4	rs1169306	T	C	-0.0983412	0.0173556	1.51E-08	7173	GCST90277256	Ceramide (d42:2) levels
5	rs11713732	T	C	0.112298	0.0236642	2.12E-06	7173	GCST90277256	Ceramide (d42:2) levels
6	rs117704733	T	C	0.136573	0.0297186	4.39E-06	7173	GCST90277256	Ceramide (d42:2) levels
7	rs12356523	A	G	0.0980092	0.0210594	3.31E-06	7173	GCST90277256	Ceramide (d42:2) levels
8	rs1260326	C	T	-0.0947977	0.0174347	5.58E-08	7173	GCST90277256	Ceramide (d42:2) levels
9	rs12763964	C	T	-0.131962	0.0206836	1.88E-10	7173	GCST90277256	Ceramide (d42:2) levels
10	rs142985829	T	C	0.362245	0.07914	4.79E-06	7173	GCST90277256	Ceramide (d42:2) levels
11	rs1572595	T	C	-0.0837854	0.0172617	1.24E-06	7173	GCST90277256	Ceramide (d42:2) levels
12	rs187429064	G	A	-0.287704	0.037735	2.75E-14	7173	GCST90277256	Ceramide (d42:2) levels
13	rs2236124	C	T	0.169704	0.0233739	4.26E-13	7173	GCST90277256	Ceramide (d42:2) levels
14	rs28505920	A	T	0.116544	0.0222444	1.66E-07	7173	GCST90277256	Ceramide (d42:2) levels
15	rs2945048	A	T	0.0858173	0.0193952	9.80E-06	7173	GCST90277256	Ceramide (d42:2) levels
16	rs364585	G	A	-0.265158	0.0173572	7.12E-52	7173	GCST90277256	Ceramide (d42:2) levels
17	rs5141	C	T	-0.124841	0.0245758	3.87E-07	7173	GCST90277256	Ceramide (d42:2) levels
18	rs55817533	C	A	0.130074	0.0262014	7.05E-07	7173	GCST90277256	Ceramide (d42:2) levels
19	rs5767288	A	G	-0.141379	0.0214117	4.31E-11	7173	GCST90277256	Ceramide (d42:2) levels
20	rs61836115	G	T	0.122607	0.0275249	8.54E-06	7173	GCST90277256	Ceramide (d42:2) levels
21	rs6503695	C	T	0.0837721	0.0179914	3.28E-06	7173	GCST90277256	Ceramide (d42:2) levels
22	rs6535831	T	G	0.120941	0.0242669	6.38E-07	7173	GCST90277256	Ceramide (d42:2) levels
23	rs6837202	A	G	-0.208618	0.0461354	6.22E-06	7173	GCST90277256	Ceramide (d42:2) levels
24	rs72999033	T	C	-0.199245	0.0343829	7.12E-09	7173	GCST90277256	Ceramide (d42:2) levels
25	rs7493416	C	T	0.0814642	0.0181819	7.57E-06	7173	GCST90277256	Ceramide (d42:2) levels
26	rs7769878	G	C	0.116048	0.0254472	5.19E-06	7173	GCST90277256	Ceramide (d42:2) levels
27	rs779714	T	C	0.120669	0.0261567	4.03E-06	7173	GCST90277256	Ceramide (d42:2) levels
28	rs78709083	T	C	0.204114	0.0437824	3.19E-06	7173	GCST90277256	Ceramide (d42:2) levels
29	rs79098941	C	T	0.26394	0.0559069	2.39E-06	7173	GCST90277256	Ceramide (d42:2) levels
30	rs9839625	A	C	-0.0867251	0.0191292	5.88E-06	7173	GCST90277256	Ceramide (d42:2) levels
31	rs10811102	T	G	-0.10651	0.0225144	2.28E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
32	rs10848158	C	T	0.093351	0.0173106	7.17E-08	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
33	rs10926263	T	G	-0.0860007	0.0188745	5.29E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
34	rs111703312	G	A	0.334396	0.0705709	2.19E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
35	rs113331384	A	G	-0.255354	0.0571099	7.89E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
36	rs117511403	A	G	0.696989	0.14303	1.12E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
37	rs11936543	G	A	-0.142956	0.028897	7.70E-07	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
38	rs149968069	T	C	-0.249663	0.0548209	5.34E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
39	rs1532085	G	A	-0.0807954	0.0171884	2.64E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
40	rs17019568	G	C	0.151007	0.0304257	7.10E-07	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
41	rs17138200	G	C	0.09136	0.0205443	8.84E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
42	rs174547	C	T	0.194339	0.0172562	3.60E-29	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
43	rs183441885	A	C	0.246975	0.0548667	6.88E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
44	rs190712692	A	G	0.244855	0.0508581	1.51E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
45	rs261334	C	G	-0.104118	0.019974	1.91E-07	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
46	rs28415525	G	A	-0.1292	0.029049	8.81E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
47	rs28844909	A	G	-0.166955	0.0348468	1.69E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
48	rs4696957	A	G	-0.167374	0.037254	7.14E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
49	rs55683433	A	C	-0.209982	0.0436299	1.52E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
50	rs57684876	T	C	0.102271	0.0217546	2.64E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
51	rs68103316	C	T	0.098414	0.0221664	9.14E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
52	rs7003304	T	C	-0.120332	0.0250167	1.54E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
53	rs709166	A	G	-0.0777567	0.0170332	5.08E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
54	rs76085699	A	G	-0.122233	0.0253286	1.42E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
55	rs78605935	T	C	0.157098	0.035175	8.09E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
56	rs9644026	C	T	0.0823628	0.018544	9.06E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
57	rs9652580	T	C	-0.0804865	0.0176219	5.02E-06	6870	GCST90277353	Phosphatidylethanolamine (O-18:1_18:2) levels
58	rs10468017	T	C	0.0885897	0.017551	4.59E-07	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
59	rs10889352	C	T	-0.154372	0.0188064	2.63E-16	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
60	rs116845732	C	T	0.714766	0.139135	2.86E-07	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
61	rs11783515	G	A	-0.0887851	0.0171691	2.39E-07	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
62	rs12428337	A	G	0.0894459	0.0194989	4.56E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
63	rs145993592	A	C	0.472327	0.104169	5.87E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
64	rs149540646	G	A	-0.0860189	0.0190759	6.60E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
65	rs149615216	T	C	0.524598	0.115971	6.17E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
66	rs1540037	G	A	0.164745	0.0197139	7.66E-17	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
67	rs174568	T	C	0.156754	0.0169763	3.37E-20	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
68	rs1751064	G	A	-0.0875134	0.019561	7.79E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
69	rs186422572	A	G	0.347295	0.0753277	4.08E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
70	rs36634	A	G	-0.121793	0.0168952	6.21E-13	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
71	rs41418546	G	T	0.148185	0.0323613	4.75E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
72	rs4804576	T	G	-0.177789	0.0345158	2.66E-07	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
73	rs6023985	C	T	-0.321299	0.0725522	9.62E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
74	rs62095282	G	A	0.121285	0.02657	5.08E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
75	rs62409317	A	G	0.194554	0.0419832	3.65E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
76	rs627108	T	C	-0.0845578	0.0170173	6.88E-07	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
77	rs72846591	C	T	0.0799913	0.0171137	3.00E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
78	rs78572804	G	A	0.406237	0.0890452	5.15E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
79	rs964184	C	G	-0.166287	0.023159	7.65E-13	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
80	rs9652580	T	C	-0.0804729	0.0172883	3.30E-06	7164	GCST90277365	Phosphatidylinositol (18:1_18:1) levels
81	rs10058653	T	G	-0.0888135	0.0193983	4.77E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
82	rs10169217	G	A	-0.0992091	0.0192486	2.63E-07	6172	GCST90277409	Triacylglycerol (56:3) levels
83	rs11151739	G	A	0.0856754	0.018767	5.08E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
84	rs111568723	G	A	0.287064	0.0587523	1.05E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
85	rs11399	T	C	0.146287	0.0300871	1.19E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
86	rs116846412	A	G	-0.244243	0.0528736	3.92E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
87	rs117786044	A	G	-0.238375	0.0508569	2.83E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
88	rs117819583	A	G	-0.251494	0.055128	5.16E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
89	rs138845231	G	A	-0.201544	0.0455668	9.89E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
90	rs145737110	T	C	0.386742	0.0844634	4.77E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
91	rs149199066	A	G	0.207797	0.0443939	2.92E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
92	rs1539733	C	T	0.0984174	0.0219538	7.49E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
93	rs174560	C	T	0.169992	0.0184354	3.95E-20	6172	GCST90277409	Triacylglycerol (56:3) levels
94	rs17596144	T	C	0.161914	0.0250548	1.11E-10	6172	GCST90277409	Triacylglycerol (56:3) levels
95	rs181023072	A	C	-0.849946	0.177513	1.72E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
96	rs2980862	C	G	-0.101363	0.020584	8.68E-07	6172	GCST90277409	Triacylglycerol (56:3) levels
97	rs4908327	T	C	-0.126958	0.0266987	2.03E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
98	rs58355654	A	G	0.119371	0.0269707	9.76E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
99	rs62016118	C	A	-0.185377	0.0419181	9.92E-06	6172	GCST90277409	Triacylglycerol (56:3) levels
100	rs622								



**Table S3** 199 SNPs for the 91 circulating inflammatory proteins

No.	SNP	EA	OA	$\beta$	SE	pval	sample	Circulating inflammatory proteins
1	rs6702801	C	G	-0.077	0.0171	6.70E-06	7943	Interleukin-1-alpha levels
2	rs12047801	T	C	0.0783	0.0171	4.67E-06	11785	Interleukin-1-alpha levels
3	rs115494443	A	G	0.2658	0.0565	2.55E-06	10853	Interleukin-1-alpha levels
4	rs565705003	A	G	0.4469	0.1004	8.54E-06	7456	Interleukin-1-alpha levels
5	rs115602471	T	C	0.2215	0.0469	2.33E-06	11340	Interleukin-1-alpha levels
6	rs190042298	A	G	0.1502	0.0339	9.39E-06	9897	Interleukin-1-alpha levels
7	rs10063171	T	G	0.0775	0.0175	9.49E-06	11340	Interleukin-1-alpha levels
8	rs10057700	A	G	-0.0822	0.0181	5.59E-06	8587	Interleukin-1-alpha levels
9	rs11759846	A	G	-0.3263	0.0266	1.36E-04	11788	Interleukin-1-alpha levels
10	rs547199103	A	T	-0.3452	0.0647	9.53E-08	7943	Interleukin-1-alpha levels
11	rs13195317	T	C	-0.3251	0.0554	4.40E-09	11301	Interleukin-1-alpha levels
12	rs12529944	T	C	-0.0845	0.0189	7.79E-06	11340	Interleukin-1-alpha levels
13	rs10233998	T	G	0.131	0.0286	4.64E-06	11785	Interleukin-1-alpha levels
14	rs16886503	A	T	0.2438	0.0524	3.28E-06	11786	Interleukin-1-alpha levels
15	rs72937918	T	C	-0.2056	0.0452	5.40E-06	11772	Interleukin-1-alpha levels
16	rs523604	A	G	0.0754	0.0142	1.10E-07	10290	Interleukin-1-alpha levels
17	rs76012752	A	G	0.1568	0.0352	8.41E-06	11340	Interleukin-1-alpha levels
18	rs7138836	A	T	-0.0982	0.0207	2.10E-06	11775	Interleukin-1-alpha levels
19	rs4767214	T	C	0.062	0.013	1.85E-06	11772	Interleukin-1-alpha levels
20	rs76544453	T	C	-0.1609	0.0361	8.31E-06	11788	Interleukin-1-alpha levels
21	rs78267257	A	G	-0.1825	0.0406	6.95E-06	10903	Interleukin-1-alpha levels
22	rs117537822	T	C	0.2176	0.0439	7.17E-07	11788	Interleukin-1-alpha levels
23	rs61098036	A	G	-0.0856	0.0187	4.70E-06	9891	Interleukin-1-alpha levels
24	rs11878153	A	G	0.1116	0.0221	4.42E-07	11787	Interleukin-1-alpha levels
25	rs2426634	A	G	-0.0896	0.0158	6.03E-06	11787	Interleukin-1-alpha levels
26	rs77336315	A	C	0.2512	0.0591	2.24E-06	13801	Interleukin-7 levels
27	rs56889120	A	G	0.097	0.021	3.86E-06	11340	Interleukin-7 levels
28	rs74131483	A	G	0.1372	0.0274	5.52E-07	13240	Interleukin-7 levels
29	rs17161952	T	C	0.0929	0.0204	5.27E-06	14734	Interleukin-7 levels
30	rs1144728120	T	C	0.1495	0.0316	2.23E-06	14717	Interleukin-7 levels
31	rs116415547	T	G	0.2093	0.046	5.36E-06	13870	Interleukin-7 levels
32	rs76004227	A	T	0.1597	0.0345	3.67E-06	12045	Interleukin-7 levels
33	rs62338232	A	G	-0.0813	0.018	6.28E-06	14288	Interleukin-7 levels
34	rs11742240	T	G	-0.0647	0.0131	7.86E-07	14736	Interleukin-7 levels
35	rs1050152	T	C	-0.0651	0.0133	9.84E-07	11785	Interleukin-7 levels
36	rs55849454	A	G	0.0729	0.0159	4.54E-06	12202	Interleukin-7 levels
37	rs62387962	T	G	-0.078	0.0176	9.34E-06	14288	Interleukin-7 levels
38	rs12699881	A	G	0.068	0.0138	8.33E-07	14288	Interleukin-7 levels
39	rs78939185	C	G	0.2134	0.0481	9.14E-06	11775	Interleukin-7 levels
40	rs112359206	A	G	0.1691	0.0225	5.67E-14	10894	Interleukin-7 levels
41	rs111066336	T	C	0.0745	0.014	1.03E-07	11538	Interleukin-7 levels
42	rs7026771	A	G	0.0691	0.0148	3.03E-06	12403	Interleukin-7 levels
43	rs112217463	T	C	-0.1374	0.031	9.33E-06	14736	Interleukin-7 levels
44	rs10734292	A	G	0.1208	0.0267	6.06E-06	11776	Interleukin-7 levels
45	rs76213792	T	G	-0.2791	0.0616	5.87E-06	14288	Interleukin-7 levels
46	rs11171132	T	C	-0.0724	0.0163	8.92E-06	14288	Interleukin-7 levels
47	rs12321566	A	G	0.0698	0.0139	5.12E-07	14287	Interleukin-7 levels
48	rs11158239	T	G	0.0965	0.0217	8.71E-06	14288	Interleukin-7 levels
49	rs570880779	T	C	-0.2336	0.0505	3.73E-06	13605	Interleukin-7 levels
50	rs79072837	T	C	-0.136	0.028	1.19E-06	14715	Interleukin-7 levels
51	rs10403201	A	G	-0.0584	0.0127	4.26E-06	14730	Interleukin-7 levels
52	rs4326609	A	T	-0.0707	0.0155	5.08E-06	11345	Leukemia inhibitory factor levels
53	rs11127419	T	C	0.0707	0.0153	3.82E-06	9252	Leukemia inhibitory factor levels
54	rs80092539	A	T	0.0993	0.0213	3.13E-06	11345	Leukemia inhibitory factor levels
55	rs825264	A	G	-0.2119	0.0453	2.90E-06	10291	Leukemia inhibitory factor levels
56	rs114974364	C	G	-0.3015	0.0631	1.77E-06	10858	Leukemia inhibitory factor levels
57	rs145344087	C	G	0.2548	0.0556	4.59E-06	10281	Leukemia inhibitory factor levels
58	rs19022173	A	C	-0.3456	0.0781	9.64E-06	9984	Leukemia inhibitory factor levels
59	rs13105239	A	C	0.0575	0.013	9.73E-06	11766	Leukemia inhibitory factor levels
60	rs4699986	T	G	0.0629	0.0139	6.03E-06	11792	Leukemia inhibitory factor levels
61	rs142330159	A	T	0.1155	0.0258	7.58E-06	9436	Leukemia inhibitory factor levels
62	rs9482537	C	G	0.1084	0.0243	8.16E-06	11345	Leukemia inhibitory factor levels
63	rs9648464	T	C	0.0606	0.0135	7.16E-06	11345	Leukemia inhibitory factor levels
64	rs111417524	T	C	0.3026	0.0674	7.14E-06	10701	Leukemia inhibitory factor levels
65	rs117675814	T	C	-0.2448	0.0544	6.80E-06	11345	Leukemia inhibitory factor levels
66	rs13264315	A	T	0.0757	0.0158	1.66E-06	9460	Leukemia inhibitory factor levels
67	rs1534627	T	C	0.06	0.0132	5.48E-06	11791	Leukemia inhibitory factor levels
68	rs74992559	A	G	0.1725	0.0367	2.60E-06	11784	Leukemia inhibitory factor levels
69	rs11608349	A	T	-0.3084	0.0661	3.08E-06	9362	Leukemia inhibitory factor levels
70	rs1348602	T	G	-0.0782	0.0173	6.18E-06	9023	Leukemia inhibitory factor levels
71	rs117844161	A	G	0.1842	0.0408	6.34E-06	11781	Leukemia inhibitory factor levels
72	rs234592	A	G	-0.0635	0.0136	3.02E-06	11345	Leukemia inhibitory factor levels
73	rs12595568	T	G	-0.0652	0.0146	7.98E-06	11792	Leukemia inhibitory factor levels
74	rs10152968	A	G	0.0678	0.0153	9.36E-06	11792	Leukemia inhibitory factor levels
75	rs147461732	A	G	0.2606	0.0583	7.82E-06	11345	Leukemia inhibitory factor levels
76	rs150843753	T	G	0.1742	0.0385	6.05E-06	11779	Leukemia inhibitory factor levels
77	rs7225483	T	G	0.0671	0.0143	2.70E-06	9849	Leukemia inhibitory factor levels
78	rs332426	A	G	0.112	0.0238	2.53E-06	11789	Leukemia inhibitory factor levels
79	rs11883375	A	G	-0.1011	0.0197	2.87E-07	11776	Leukemia inhibitory factor levels
80	rs62213023	T	C	-0.1676	0.0374	7.42E-06	11345	Leukemia inhibitory factor levels
81	rs10178845	A	G	-0.0682	0.0144	2.18E-06	11765	Tumor necrosis factor receptor superfamily member 9 levels
82	rs10744409	A	G	0.064	0.0131	1.03E-06	11764	Tumor necrosis factor receptor superfamily member 9 levels
83	rs111163188	T	C	0.1013	0.0224	6.12E-06	6879	Tumor necrosis factor receptor superfamily member 9 levels
84	rs11202989	T	C	-0.0995	0.0212	2.69E-06	11336	Tumor necrosis factor receptor superfamily member 9 levels
85	rs118083884	A	G	0.3284	0.0668	8.83E-07	9785	Tumor necrosis factor receptor superfamily member 9 levels
86	rs118085931	A	G	-0.182	0.0403	6.30E-06	11784	Tumor necrosis factor receptor superfamily member 9 levels
87	rs12227836	A	G	-0.0669	0.014	1.77E-06	11336	Tumor necrosis factor receptor superfamily member 9 levels
88	rs12874404	A	G	-0.1402	0.0296	2.17E-06	11336	Tumor necrosis factor receptor superfamily member 9 levels
89	rs13229950	A	G	-0.1713	0.0381	6.92E-06	11779	Tumor necrosis factor receptor superfamily member 9 levels
90	rs140214797	T	G	0.2317	0.0504	4.28E-06	11769	Tumor necrosis factor receptor superfamily member 9 levels
91	rs144141891	T	C	0.2076	0.0463	7.33E-06	10288	Tumor necrosis factor receptor superfamily member 9 levels
92	rs146380867	A	G	0.3742	0.0814	4.29E-06	10849	Tumor necrosis factor receptor superfamily member 9 levels
93	rs1645331	C	G	0.097	0.0206	2.49E-06	9033	Tumor necrosis factor receptor superfamily member 9 levels
94	rs1776354	A	G	-0.1301	0.013	1.41E-23	11783	Tumor necrosis factor receptor superfamily member 9 levels
95	rs1846520	A	G	-0.1626	0.0313	2.05E-07	11782	Tumor necrosis factor receptor superfamily member 9 levels
96	rs192538756	A	T	0.1189	0.0242	8.96E-07	9453	Tumor necrosis factor receptor superfamily member 9 levels
97	rs202221060	A	C	0.1839	0.0405	5.61E-06	8376	Tumor necrosis factor receptor superfamily member 9 levels
98	rs2579649	A	C	-0.0968	0.0199	1.15E-06	11336	Tumor necrosis factor receptor superfamily member 9 levels
99	rs2854008	A	G	0.0926	0.0149	5.14E-10	11784	Tumor necrosis factor receptor superfamily member 9 levels
100	rs3184504	T	C	0.0681	0.013	1.62E-07	11784	Tumor necrosis factor receptor superfamily member 9 levels
101	rs35055143	A	C	-0.0668	0.0151	9.70E-06	9452	Tumor necrosis factor receptor superfamily member 9 levels
102	rs4016108	T	G	0.0705	0.0159	9.25E-06	8807	Tumor necrosis factor receptor superfamily member 9 levels
103	rs4976685	A	G	-0.0693	0.0139	6.18E-07	11763	Tumor necrosis factor receptor superfamily member 9 levels
104	rs56079234	A	G	0.0647	0.0145	8.12E-06	11335	Tumor necrosis factor receptor superfamily member 9 levels
105	rs57700441	C	G	-0.1155	0.0228	4.07E-07	11773	Tumor necrosis factor receptor superfamily member 9 levels
106	rs72850206	A	T	-0.1438	0.0281	3.10E-07	11336	Tumor necrosis factor receptor superfamily member 9 levels
107	rs72964492	A	C	0.3111	0.065	1.70E-06	9983	Tumor necrosis factor receptor superfamily member 9 levels
108	rs75246422	T	C	-0.0982	0.0203	1.32E-06	11784	Tumor necrosis factor receptor superfamily member 9 levels
109	rs76428106	T	C	-0.2714	0.0593	4.72E-06	10849	Tumor necrosis factor receptor superfamily member 9 levels
110	rs7737635	A	G	0.0924	0.0201	4.29E-06	9453	Tumor necrosis factor receptor superfamily member 9 levels
111	rs77558588	C	G	-0.2033	0.0455	7.89E-06	11783	Tumor necrosis factor receptor superfamily member 9 levels
112	rs77827048	A	C	0.2584	0.0575	6.99E-06	10549	Tumor necrosis factor receptor superfamily member 9 levels
113	rs7858310	A	G	0.0707	0.0152	3.30E-06	11336	Tumor necrosis factor receptor superfamily member 9 levels
114	rs78639230	C	G	0.3202	0.0703	5.24E-06	9320	Tumor necrosis factor receptor superfamily member 9 levels
115	rs8005108	C	G	0.0889	0.0182	1.04E-06	9453	Tumor necrosis factor receptor superfamily member 9 levels
116	rs9669611	T	C	0.0703	0.015	2.78E-06	11783	Tumor necrosis factor receptor superfamily member 9 levels
117	rs1072074	A	G	-0.0649	0.0141	4.17E-06	11785	Interleukin-17C levels
118	rs10870773	A	G	-0.0816	0.0171	1.82E-06	11345	Interleukin-17C levels
119	rs113334480	T	C	-0.0962	0.0217	9.29E-06	11788	Interleukin-17C levels
120	rs113702571	T	C	-0.2558	0.0564	5.75E-06	11786	Interleukin-17C levels
121	rs114882743	A	T	-0.3259	0.0548	2.73E-09	11345	Interleukin-17C levels
122	rs11931996	T	C	-0.1219	0.0262	3.28E-06	11345	Interleukin-17C levels
123	rs12092228	T	G	0.1508	0.0327	4.00E-06	9892	Interleukin-17C levels
124	rs12445031	C	G	-0.09	0.0195	3.92E-06	11339	Interleukin-17C levels
125	rs12863903	T	C	-0.0857	0.018	1.93E-06	11345	Interleukin-17C levels
126	rs12895022	T	C	0.1091	0.0236	3.78E-06	11774	Interleukin-17C levels
127	rs139152046	T	G	-0.2421	0.0536	6.28E-06	9422	Interleukin-17C levels
128	rs139637682	T	C	-0.3301	0.0737	7.50E-06	8488	Interleukin-17C levels
129	rs149756404	A	C	-0.2749	0.0524	1.55E-07	11302	Interleukin-17C levels
130	rs17700884	T	G	-0.105	0.			

**Table S4** The causal effects of plasma lipidome on ED

Exposure	Outcome	nSNP	Methods	OR	or_lci95	or_uci95	P
Ceramide (d42:2) levels	ED	30	Inverse variance weighted	1.09348242	1.016585765	1.176195699	0.02
			MR Egger	1.112595711	0.92127619	1.343646161	0.28
			Weighted median	1.098909693	0.977292431	1.23566138	0.12
			Weighted mode	1.090416832	0.96180237	1.236229921	0.19
Phosphatidylethanolamine (O-18:1_18:2) levels	ED	27	Inverse variance weighted	0.912322826	0.837909754	0.993344373	0.04
			MR Egger	0.978497544	0.800719507	1.195746369	0.83
			Weighted median	0.954482442	0.840352371	1.084112765	0.47
			Weighted mode	0.982328395	0.842272086	1.145673818	0.82
Phosphatidylinositol (18:1_18:1) levels	ED	23	Inverse variance weighted	0.919548295	0.850739665	0.993922231	0.04
			MR Egger	0.859732575	0.733026998	1.008339534	0.08
			Weighted median	0.943016813	0.844070441	1.053562199	0.30
			Weighted mode	0.951405582	0.785644049	1.152140824	0.62
Triacylglycerol (56:3) levels	ED	24	Inverse variance weighted	1.087085172	1.008975386	1.171241823	0.03
			MR Egger	1.061016028	0.908920036	1.238563314	0.46
			Weighted median	1.121608103	1.007933233	1.248103243	0.04
			Weighted mode	1.126479456	0.973831997	1.303054294	0.12

nSNP, number of single-nucleotide polymorphism; OR, odds ratio; CI, confidence intervals; MR, Mendelian randomization; ED, erectile dysfunction.



**Table S5** The characteristics of 104 SNPs analyzing the causal effects of the 4 plasma lipidome on ED

Exposure	Outcome	SNPs	EA	OA	chr	β.exposure	EAF.exposure	SE.exposure	pval.exposure	R2	F	Steiger	Steiger.pval		
Ceramide (d42:2) levels	ED	rs1042034	T	C	2	0.102639	0.727594	0.018599	3.54E-08	0.004176001	30.07168283	TRUE	3.91E-07		
		rs11507232	A	G	9	0.126578	0.0949966	0.0286346	9.99E-06	0.002754893	19.8099115	TRUE	1.95E-05		
		rs116327692	T	C	2	0.346637	0.0142941	0.0715174	1.28E-06	0.003859977	24.36333469	TRUE	1.91E-06		
		rs1169306	T	C	12	-0.0983412	0.359634	0.0173556	1.51E-08	0.004454408	32.0854829	TRUE	3.11E-08		
		rs11713732	T	C	3	0.112298	0.160202	0.0236642	2.12E-06	0.003393257	24.41589845	TRUE	3.54E-06		
		rs117704733	T	C	17	0.136573	0.0875997	0.0297186	4.39E-06	0.002981589	21.44491242	TRUE	7.63E-06		
		rs12356523	A	G	10	0.0980092	0.190552	0.0210594	3.31E-06	0.002963235	21.31251489	TRUE	9.33E-06		
		rs1260326	C	T	2	-0.0947977	0.650878	0.0174347	5.58E-08	0.004084157	29.40759355	TRUE	1.41E-07		
		rs12763964	C	T	10	-0.131962	0.205697	0.0206836	1.88E-10	0.005690389	41.03930708	TRUE	2.47E-09		
		rs142985829	T	C	3	0.362245	0.0121236	0.07914	4.79E-06	0.003143178	22.61080069	TRUE	1.03E-05		
		rs1572595	T	C	10	-0.0837854	0.382105	0.0172617	1.24E-06	0.003314852	23.84985964	TRUE	3.81E-06		
		rs187429064	G	A	19	-0.287704	0.0535314	0.037735	2.75E-14	0.008387579	60.65608447	TRUE	3.64E-13		
		rs2236124	C	T	20	0.169704	0.146373	0.0233739	4.26E-13	0.007196864	51.98282205	TRUE	1.27E-12		
		rs28505920	A	T	8	0.116544	0.171403	0.0222444	1.66E-07	0.003858083	27.77346837	TRUE	3.40E-07		
		rs2945048	A	T	19	0.0858173	0.240793	0.0193952	9.80E-06	0.002692674	19.36129772	TRUE	2.82E-05		
		rs364585	G	A	20	-0.265158	0.66136	0.0173572	7.12E-52	0.031493117	233.1807291	TRUE	4.12E-49		
		rs5141	C	T	11	-0.124841	0.863694	0.0245758	3.87E-07	0.003669605	26.41165965	TRUE	2.67E-06		
		rs55817533	C	A	2	0.130074	0.115611	0.0262014	7.05E-07	0.00345982	24.89650505	TRUE	1.61E-06		
		rs5767288	A	G	22	-0.141379	0.190342	0.0214117	4.31E-11	0.006160785	44.45285302	TRUE	1.22E-10		
		rs61836115	G	T	10	0.122607	0.10482	0.0275249	8.54E-06	0.002821078	20.28718017	TRUE	4.55E-05		
		rs6503695	C	T	17	0.0837721	0.31405	0.0179914	3.28E-06	0.00302357	21.74777796	TRUE	1.03E-05		
		rs6535831	T	G	4	0.120941	0.860853	0.0242669	6.38E-07	0.003504128	25.21646296	TRUE	1.34E-06		
		rs6837202	A	G	4	-0.208618	0.0334349	0.0461354	6.22E-06	0.002812967	20.22869142	TRUE	2.54E-05		
		rs72999033	T	C	19	-0.199245	0.0623971	0.0343829	7.12E-09	0.004645027	33.46493135	TRUE	2.30E-08		
		rs7493416	C	T	14	0.0814642	0.691495	0.0181819	7.57E-06	0.002831489	20.36226136	TRUE	2.89E-05		
		rs7769878	G	C	6	0.116048	0.133712	0.0254472	5.19E-06	0.003119881	22.4426836	TRUE	1.35E-05		
		rs779714	T	C	3	0.120669	0.8701	0.0261567	4.03E-06	0.003291545	23.68161535	TRUE	1.05E-05		
		rs78709083	T	C	21	0.204114	0.0392165	0.0437824	3.19E-06	0.003139568	22.58475141	TRUE	7.40E-06		
		rs79098941	C	T	16	0.26394	0.0238872	0.0559069	2.39E-06	0.003248671	23.37214505	TRUE	5.88E-06		
		rs9839625	A	C	3	-0.0867251	0.260416	0.0191292	5.88E-06	0.002897175	20.83601019	TRUE	8.54E-06		
Phosphatidylcholine (18:0_22:6) levels	ED	rs10811102	T	G	9	-0.10651	0.195363	0.0225144	2.28E-06	0.003566589	24.58301154	TRUE	3.27E-06		
		rs10848158	C	T	12	0.093351	0.43372	0.0173106	7.17E-08	0.004280639	29.52581893	TRUE	1.78E-07		
		rs10926263	T	G	1	-0.0860007	0.698077	0.0188745	5.29E-06	0.003117694	21.47928865	TRUE	1.07E-05		
		rs111703312	G	A	2	0.334396	0.015707	0.0705709	2.19E-06	0.00345756	23.82891518	TRUE	3.73E-06		
		rs113331384	A	G	6	-0.255354	0.0226715	0.0571099	7.89E-06	0.002889589	19.90321253	TRUE	2.56E-05		
		rs117511403	A	G	18	0.696989	0.00370152	0.14303	1.12E-06	0.003583038	24.6967944	TRUE	2.32E-06		
		rs11936543	G	A	4	-0.142956	0.0997795	0.028897	7.70E-07	0.003671343	25.30769885	TRUE	2.14E-06		
		rs149968069	T	C	1	-0.249663	0.0252958	0.0548209	5.34E-06	0.003073687	21.17516724	TRUE	1.05E-05		
		rs1532085	G	A	15	-0.0807954	0.573441	0.0171884	2.64E-06	0.003193531	22.0034386	TRUE	4.15E-06		
		rs17019568	G	C	4	0.151007	0.0879835	0.0304257	7.10E-07	0.003659553	25.22612889	TRUE	2.24E-06		
		rs17138200	G	C	7	0.09136	0.214136	0.0205443	8.84E-06	0.002809178	19.34778584	TRUE	1.61E-05		
		rs174547	C	T	11	0.194339	0.407429	0.0172562	3.60E-29	0.018236532	127.5750283	TRUE	4.80E-28		
		rs183441885	A	C	8	0.246975	0.0255902	0.0548667	6.88E-06	0.003041945	20.95582229	TRUE	1.54E-05		
		rs190712692	A	G	19	0.244855	0.0302315	0.0508581	1.51E-06	0.003515408	24.22899595	TRUE	8.02E-06		
		rs261334	C	G	15	-0.104118	0.758255	0.019974	1.91E-07	0.003974243	27.40401082	TRUE	1.67E-06		
		rs28415525	G	A	17	-0.1292	0.0945601	0.029049	8.81E-06	0.002858397	19.68774722	TRUE	1.52E-05		
		rs28844909	A	G	4	-0.166955	0.0666079	0.0348468	1.69E-06	0.003465921	23.88673819	TRUE	3.37E-06		
		rs4696957	A	G	4	-0.167374	0.0575016	0.037254	7.14E-06	0.003036453	20.91787408	TRUE	2.08E-05		
		rs55683433	A	C	4	-0.209982	0.0424291	0.0436299	1.52E-06	0.003582852	24.69550914	TRUE	3.30E-06		
		rs57684876	T	C	19	0.102271	0.187431	0.0217546	2.64E-06	0.003185933	21.95092375	TRUE	5.04E-06		
		rs68103316	C	T	7	0.098414	0.184298	0.0221664	9.14E-06	0.00291203	20.05823537	TRUE	2.22E-05		
		rs7003304	T	C	8	-0.120332	0.138929	0.0250167	1.54E-06	0.003464369	23.87600127	TRUE	4.10E-06		
		rs709166	A	G	3	-0.0777567	0.473223	0.0170332	5.08E-06	0.003014382	20.76537027	TRUE	2.88E-05		
		rs76085699	A	G	1	-0.122233	0.134293	0.0253286	1.42E-06	0.003474011	23.94268764	TRUE	1.22E-05		
		rs78605935	T	C	20	0.157098	0.0660023	0.035175	8.09E-06	0.003042819	20.9618672	TRUE	4.45E-05		
		rs9644026	C	T	8	0.0823628	0.309704	0.018544	9.06E-06	0.00290051	19.97865118	TRUE	1.30E-05		
		rs9652580	T	C	16	-0.0804865	0.423379	0.0176219	5.02E-06	0.003162976	21.79224507	TRUE	7.53E-06		
		Diacylglycerol (18:1_18:3) levels	ED	rs10468017	T	C	15	0.0885897	0.337526	0.017551	4.59E-07	0.00350972	25.22515123	TRUE	8.27E-07
				rs10889352	C	T	1	-0.154372	0.262366	0.0188064	2.63E-16	0.00922392	66.67673752	TRUE	9.17E-15
				rs116845732	C	T	14	0.714766	0.00357409	0.139135	2.86E-07	0.003638884	26.15687217	TRUE	6.48E-07
rs11783515	G			A	8	-0.0887851	0.625763	0.0171691	2.39E-07	0.003692043	26.54040182	TRUE	7.22E-07		
rs12428337	A			G	13	0.0894459	0.238142	0.0194989	4.56E-06	0.002903093	20.8524865	TRUE	1.05E-05		
rs145993592	A			C	9	0.472327	0.00669741	0.104169	5.87E-06	0.002968274	21.32206844	TRUE	9.87E-06		
rs149540646	G			A	3	-0.0860189	0.257857	0.0190759	6.60E-06	0.002831942	20.339967	TRUE	1.13E-05		
rs149615216	T			C	18	0.524598	0.0049109	0.115971	6.17E-06	0.002689715	19.31569484	TRUE	9.37E-06		
rs1540037	G			A	18	0.164745	0.756927	0.0197139	7.66E-17	0.009987233	72.25014462	TRUE	6.35E-16		
rs174568	T			C	11	0.156754	0.40512	0.0169763	3.37E-20	0.011843507	85.83983997	TRUE	2.39E-19		
rs1751064	G			A	13	-0.0875134	0.759894	0.019561	7.79E-06	0.0027947	20.07173324	TRUE	1.11E-05		
rs186422572	A			G	14	0.347295	0.013181	0.0753277	4.08E-06	0.003137711	22.54301861	TRUE	1.55E-05		
rs36634	A			G	19	-0.121793	0.592939	0.0168952	6.21E-13	0.007160513	51.6534625	TRUE	1.56E-11		
rs41418546	G			T	21	0.148185	0.0762262	0.0323613	4.75E-06	0.003092491	22.21712429	TRUE	1.37E-05		
rs4804576	T			G	19	-0.177789	0.0624361	0.0345158	2.66E-07	0.003700636	26.60240361	TRUE	8.07E-07		
rs6023985	C			T	20	-0.321299	0.0142944	0.0725522	9.62E-06	0.002909122	20.89591878	TRUE	1.33E-05		
rs62095282	G			A	18	0.121285	0.121375	0.02657	5.08E-06	0.003137451	22.54114727	TRUE	1.26E-05		
rs62409317	A			G	4	0.194554	0.0462257	0.0419832	3.65E-06	0.00333764	23.98422535	TRUE	7.09E-06		
rs627108	T			C	1	-0.0845578	0.395819	0.0170173	6.88E-07	0.003419803	24.57667408	TRUE	2.62E-06		
rs72846591	C			T	2	0.0799913	0.397637	0.0171137	3.00E-06	0.003065212	22.02054927	TRUE	7.23E-06		
rs78572804	G			A	10	0.406237	0.00967732	0.0890452	5.15E-06	0.003163157	22.7264191	TRUE	7.32E-05		
rs964184	C			G	11	-0.166287	0.848991	0.023159	7.65E-13	0.0070					

**Table S6** The causal effects of circulating inflammatory proteins on ED

Exposure	Outcome	nsnp	Methods	OR	or_ici95	or_uci95	P
Interleukin-1-alpha levels	ED	25	Inverse variance weighted	1.119332516	1.001263992	1.251323619	0.048
			MR Egger	1.172040837	0.948514988	1.448242507	0.16
			Weighted median	1.151262807	0.968587649	1.368390411	0.11
			Weighted mode	1.182495804	0.965528114	1.448219174	0.12
Interleukin-7 levels	ED	26	Inverse variance weighted	1.179099458	1.015020474	1.369701961	0.03
			MR Egger	1.079104175	0.730857796	1.593286448	0.71
			Weighted median	1.098863199	0.890764343	1.355577756	0.38
			Weighted mode	1.093834363	0.76089126	1.572463344	0.63
Leukemia inhibitory factor levels	ED	29	Inverse variance weighted	0.873436587	0.767922426	0.993448617	0.04
			MR Egger	0.905842644	0.678889857	1.208665718	0.51
			Weighted median	0.896833875	0.740972596	1.085480088	0.26
			Weighted mode	0.623268486	0.395908514	0.981195382	0.051
Tumor necrosis factor receptor superfamily member 9 levels	ED	36	Inverse variance weighted	1.11108034	1.002973449	1.230839683	0.044
			MR Egger	1.120161129	0.877052303	1.430656929	0.37
			Weighted median	1.106943195	0.955926447	1.281817487	0.18
			Weighted mode	1.102658892	0.874635575	1.390129406	0.41
Interleukin-17C levels	ED	39	Inverse variance weighted	1.11247056	1.002361397	1.234675189	0.045
			MR Egger	1.310177945	1.018462076	1.685449354	0.042
			Weighted median	1.101201871	0.946795942	1.280788719	0.21
			Weighted mode	1.030275411	0.807773626	1.314065462	0.81
Urokinase-type plasminogen activator levels	ED	44	Inverse variance weighted	0.868358367	0.789080061	0.955601707	0.004
			MR Egger	0.730015929	0.585933066	0.90952924	0.008
			Weighted median	0.866542289	0.748382789	1.003357573	0.056
			Weighted mode	0.761155325	0.614383737	0.942989526	0.02

nSNP, number of single-nucleotide polymorphism; OR, odds ratio; CI, confidence intervals; MR, Mendelian randomization; ED, erectile dysfunction.

**Table S7** Causal effects of plasma lipidome associated with ED on circulating inflammatory proteins associated with ED

Exposure	Outcome	nsnp	Methods	OR	or_lci95	or_uci95	P
Ceramide (d42:2) levels	Interleukin-1-alpha levels	8	IVW	1.028994752	0.960619266	1.102237105	0.42
Phosphatidylethanolamine (O-18:1_18:2)		0		Null	Null	Null	Null
Phosphatidylinositol (18:1_18:1) levels		5		1.006046859	0.923184981	1.096346132	0.89
Triacylglycerol (56:3) levels		4		0.921073432	0.825617808	1.027565368	0.14
Ceramide (d42:2) levels	Interleukin-7 levels	8	IVW	0.958752156	0.895325129	1.026672509	0.23
Phosphatidylethanolamine (O-18:1_18:2)		0		Null	Null	Null	Null
Phosphatidylinositol (18:1_18:1) levels		5		1.021369363	0.900797476	1.158079817	0.74
Triacylglycerol (56:3) levels		0		1.113781578	0.952751226	1.302028662	0.18
Ceramide (d42:2) levels	Leukemia inhibitory factor levels	8	IVW	1.045658733	0.967147406	1.130543472	0.26
Phosphatidylethanolamine (O-18:1_18:2)		0		Null	Null	Null	Null
Phosphatidylinositol (18:1_18:1) levels		5		0.961357822	0.882089243	1.047749838	0.37
Triacylglycerol (56:3) levels		0		0.992893244	0.9074591	1.086370718	0.88
Ceramide (d42:2) levels	Tumor necrosis factor receptor superfamily member 9 levels	8	IVW	1.010629471	0.936262963	1.090902842	0.79
Phosphatidylethanolamine (O-18:1_18:2)		0		Null	Null	Null	Null
Phosphatidylinositol (18:1_18:1) levels		5		0.046199987	0.915925176	0.840160152	0.99
Triacylglycerol (56:3) levels		0		0.990069197	0.90004295	1.089100264	0.84
Ceramide (d42:2) levels	Interleukin-17C levels	8	IVW	0.989817171	0.9240953	1.060213197	0.77
Phosphatidylethanolamine (O-18:1_18:2)		0		Null	Null	Null	Null
Phosphatidylinositol (18:1_18:1) levels		5		1.118260286	1.026355643	1.218394497	0.01
Triacylglycerol (56:3) levels		4		1.054052285	0.924126099	1.202245256	0.43
Ceramide (d42:2) levels	Urokinase-type plasminogen activator levels	8	IVW	0.987319825	0.887051953	1.098921471	0.82
Phosphatidylethanolamine (O-18:1_18:2)		0		Null	Null	Null	Null
Phosphatidylinositol (18:1_18:1) levels		5		1.046321437	0.964370799	1.135236106	0.28
Triacylglycerol (56:3) levels		4		1.113930053	1.028643911	1.206287375	0.008

nSNP, number of single-nucleotide polymorphism; OR, odds ratio; CI, confidence intervals; IVW, inverse variance weighted; ED, erectile dysfunction.

**Table S8** The mediation analysis results

Mediator	Exposure	Outcome	Total effect	Direct effect	Mediation effect	P	Mediated proportion (%)	Mediating effect proportion confidence interval
			BETA (95% CI)	BETA (95% CI)	BETA (95% CI)			
Urokinase-type plasminogen activator levels	Triacylglycerol (56:3) levels	Erectile dysfunction	0.084 (1.001-1.171)	0.096 (1.021-1.187)	-0.012 (0.976-1)	0.04	-14.711	-0.289~-0.005

CI, confidence interval.

**Table S9** The causal effects of ED on plasma lipidome and circulating inflammatory proteins

Exposure	Outcome	nSNP	Methods	OR	or_lci95	or_uci95	P
ED	Ceramide (d42:2) levels	12	Inverse variance weighted	1.00736	0.92520349	1.096812325	0.87
			MR Egger	1.043855	0.84102316	1.295603271	0.71
			Weighted median	1.034713	0.92206518	1.161122235	0.56
			Weighted mode	1.054752	0.9110994	1.221054639	0.49
ED	Phosphatidylethanolamine (O-18:1_18:2)	12	Inverse variance weighted	0.965677	0.88081182	1.058719833	0.46
			MR Egger	0.926025	0.73825677	1.161549399	0.53
			Weighted median	0.980843	0.8689961	1.107086562	0.75
			Weighted mode	1.003669	0.878115	1.147175513	0.96
ED	Phosphatidylinositol (18:1_18:1) levels	12	Inverse variance weighted	0.988542	0.9060281	1.078570651	0.80
			MR Egger	1.048468	0.83326457	1.319251069	0.70
			Weighted median	1.027312	0.91612713	1.151990695	0.65
			Weighted mode	1.027833	0.89308772	1.182907475	0.71
ED	Triacylglycerol (56:3) levels	12	Inverse variance weighted	0.998643	0.91669707	1.087914882	0.98
			MR Egger	1.067806	0.86822196	1.313268633	0.55
			Weighted median	0.991681	0.87971114	1.117903289	0.89
			Weighted mode	0.98391	0.85505602	1.132181829	0.82
ED	Interleukin-1-alpha levels	0	Inverse variance weighted	Null	Null	Null	Null
			MR Egger	Null	Null	Null	Null
			Weighted median	Null	Null	Null	Null
			Weighted mode	Null	Null	Null	Null
ED	Interleukin-7 levels	0	Inverse variance weighted	Null	Null	Null	Null
			MR Egger	Null	Null	Null	Null
			Weighted median	Null	Null	Null	Null
			Weighted mode	Null	Null	Null	Null
ED	Leukemia inhibitory factor levels	1	Inverse variance weighted	Null	Null	Null	Null
			MR Egger	Null	Null	Null	Null
			Weighted median	Null	Null	Null	Null
			Weighted mode	Null	Null	Null	Null
ED	Tumor necrosis factor receptor superfamily member 9 levels	1	Inverse variance weighted	Null	Null	Null	Null
			MR Egger	Null	Null	Null	Null
			Weighted median	Null	Null	Null	Null
			Weighted mode	Null	Null	Null	Null
ED	Interleukin-17C levels	1	Inverse variance weighted	Null	Null	Null	Null
			MR Egger	Null	Null	Null	Null
			Weighted median	Null	Null	Null	Null
			Weighted mode	Null	Null	Null	Null
ED	Urokinase-type plasminogen activator levels	1	Inverse variance weighted	Null	Null	Null	Null
			MR Egger	Null	Null	Null	Null
			Weighted median	Null	Null	Null	Null
			Weighted mode	Null	Null	Null	Null

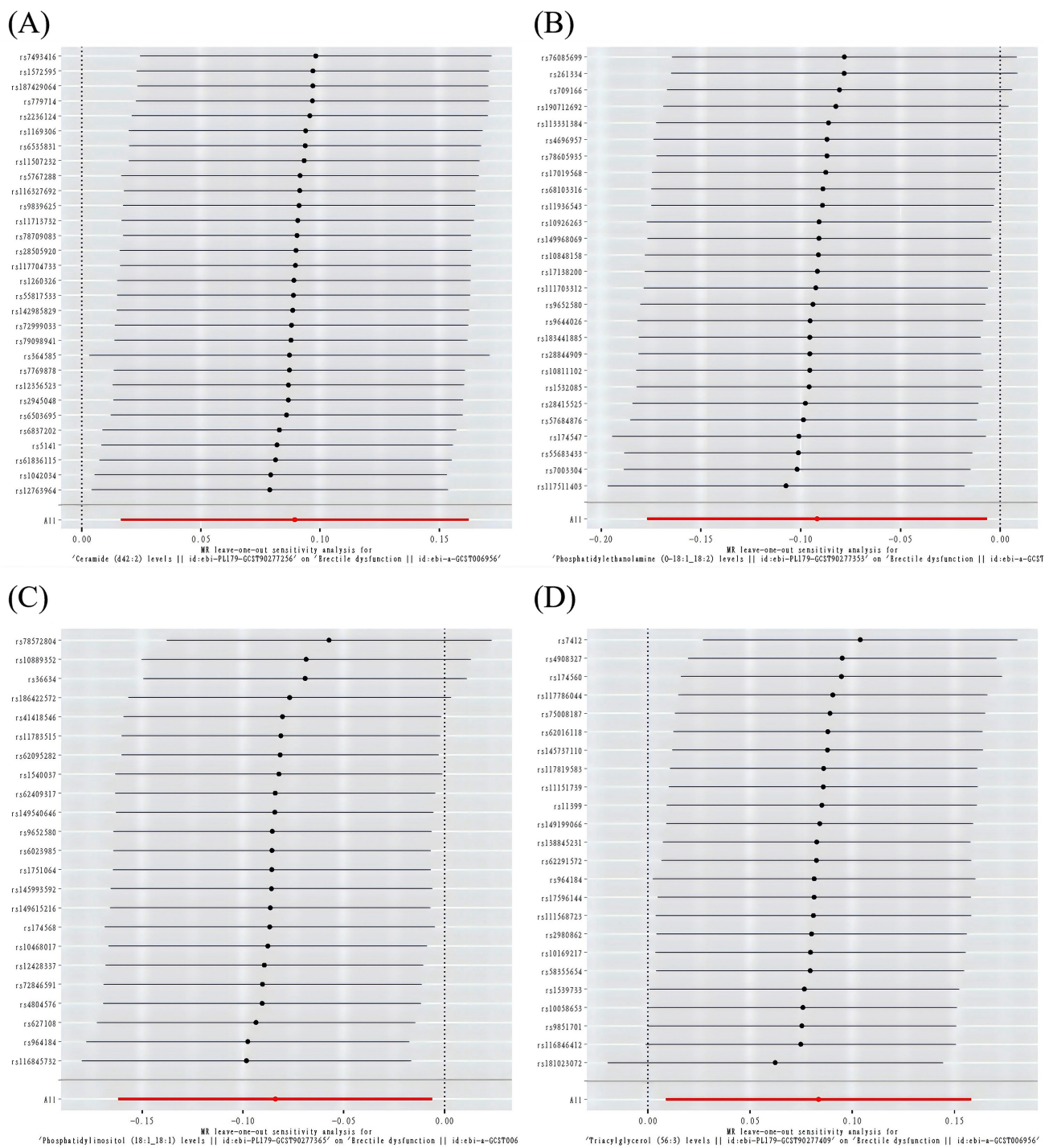
nSNP, number of single-nucleotide polymorphism; OR, odds ratio; CI, confidence intervals; Val, validation dataset; MR, Mendelian randomization; ED, erectile dysfunction.

**Table S10** Mendelian randomization sensitivity analysis of ED

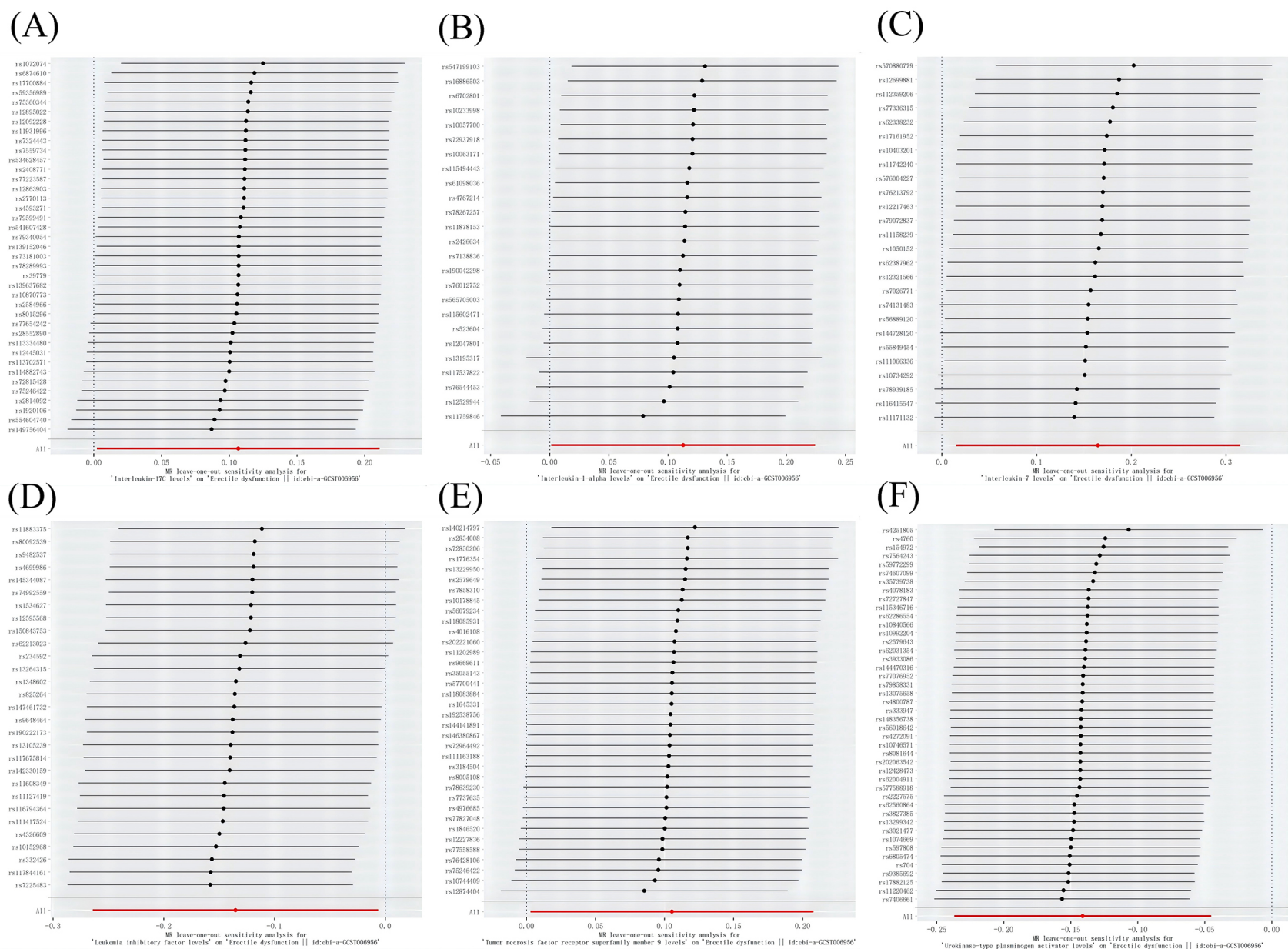
Exposure	Outcome	Pleiotropy test			Heterogeneity test			MR-PRESSO	
		Intercept	SE	P value	Method	Cochran's Q statistic	P value	Global Test	P value
Ceramide (d42:2) levels	ED	-0.00253641	0.012996868	0.85	IVW	21.15466263	0.85	22.258	0.88
Phosphatidylethanolamine (O-18:1_18:2) levels	ED	-0.009757627	0.012908014	0.46	IVW	20.30374726	0.78	21.724	0.8
Phosphatidylinositol (18:1_18:1) levels	ED	0.01089887	0.011506504	0.35	IVW	19.29251302	0.63	21.600	0.62
Triacylglycerol (56:3) levels	ED	0.004534409	0.012921526	0.73	IVW	21.87330984	0.53	23.953	0.54
Interleukin-1-alpha levels	ED	-0.006945826	0.013852281	0.62	IVW	19.74848803	0.71	21.404	0.73
Interleukin-7 levels	ED	0.008851967	0.018281292	0.63	IVW	27.47152361	0.33	29.563	0.35
Leukemia inhibitory factor levels	ED	-0.003700394	0.013317663	0.78	IVW	29.59997359	0.38	32.035	0.38
Tumor necrosis factor receptor superfamily member 9 levels	ED	-0.000918527	0.01279397	0.94	IVW	23.38517083	0.93	24.804	0.93
Interleukin-17C levels	ED	-0.017877527	0.012785361	0.17	IVW	34.63936183	0.58	83.089	0.95
Urokinase-type plasminogen activator levels	ED	0.01757769	0.010279471	0.10	IVW	46.65911461	0.32	105.3704	0.79

SE standard error; IVW inverse variance weighted; MR-PRESSO, MR-Pleiotropy RESidual Sum and Outlier method; ED, erectile dysfunction.

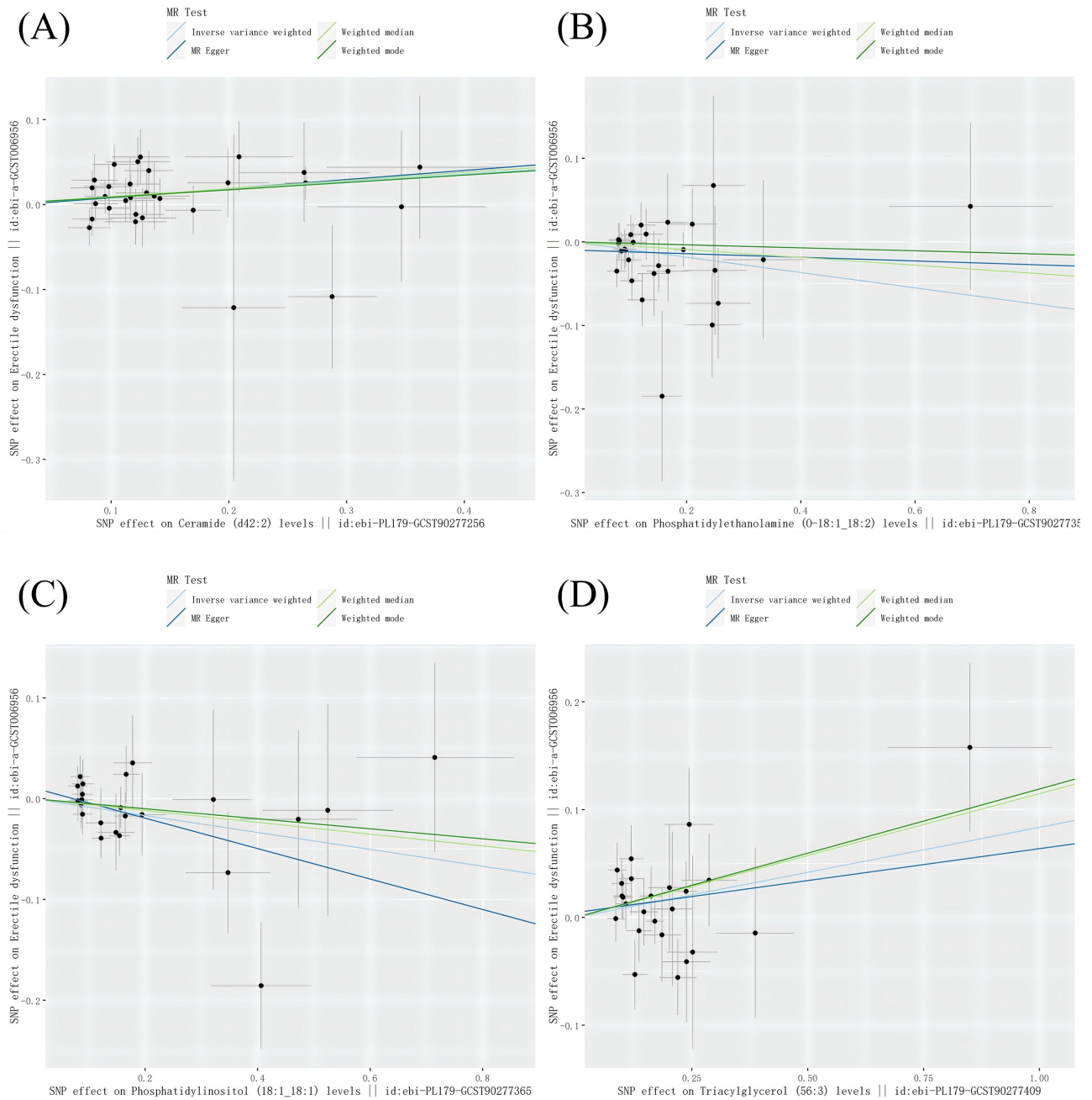




**Figure S1** MR leave-one-out sensitivity analysis for Plasma lipidome on ED. (A) Analysis for “Ceramide (d42:2) levels” on “ED”. (B) Analysis for “Phosphatidylethanolamine (O-18:1\_18:2) levels” on “ED”. (C) Analysis for “Phosphatidylinositol (18:1\_18:1) levels” on “ED”. (D) Analysis for “Triacylglycerol (56:3) levels” on “ED”. MR, Mendelian randomization; ED, erectile dysfunction.

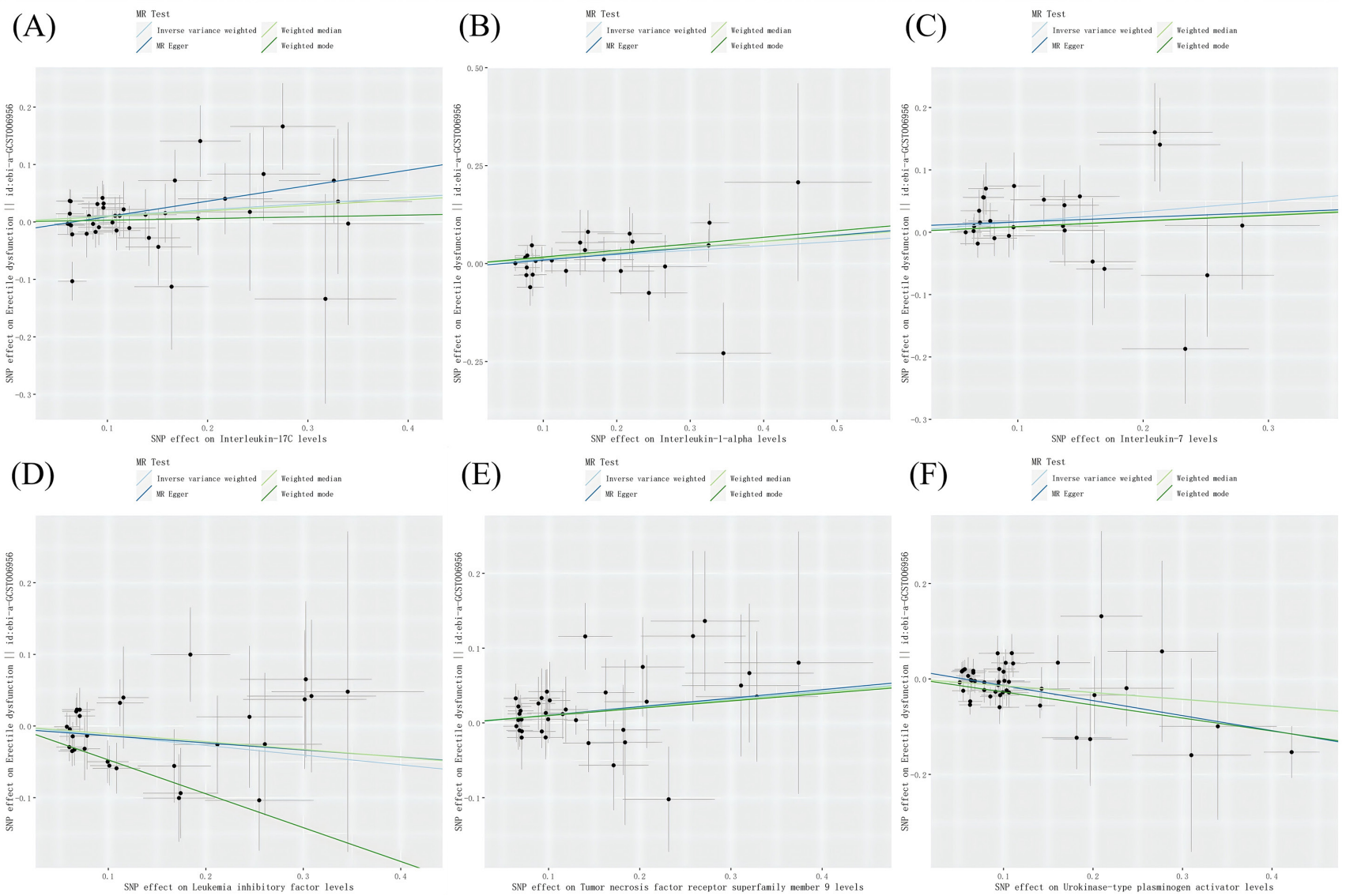


**Figure S2** MR leave-one-out sensitivity analysis for Circulating inflammatory proteins on ED. (A) Analysis for “Interleukin-17C levels” on “ED”. (B) Analysis for “Interleukin-1-alpha levels” on “ED”. (C) Analysis for “Interleukin-7 levels” on “ED”. (D) Analysis for “Leukemia inhibitory factor levels” on “ED”. (E) Analysis for “Tumor necrosis factor receptor superfamily member 9 levels” on “ED”. (F) Analysis for “Urokinase-type plasminogen activator levels” on “ED”. MR, Mendelian randomization; ED, erectile dysfunction.



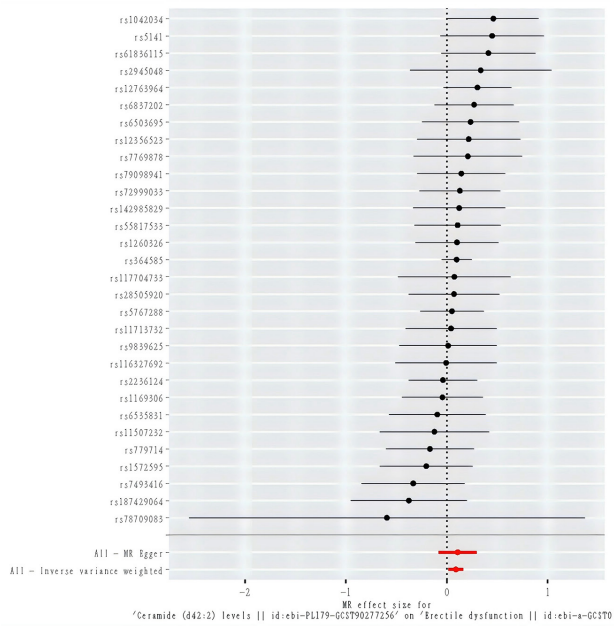
**Figure S3** Scatter plots for the effect of Plasma lipidome on ED. (A) Analysis for “Ceramide (d42:2) levels” on “ED”. (B) Analysis for “Phosphatidylethanolamine (O-18:1\_18:2) levels” on “ED”. (C) Analysis for “Phosphatidylinositol (18:1\_18:1) levels” on “ED”. (D) Analysis for “Triacylglycerol (56:3) levels” on “ED”. MR, Mendelian randomization; SNP, single nucleotide polymorphism; ED, erectile dysfunction.



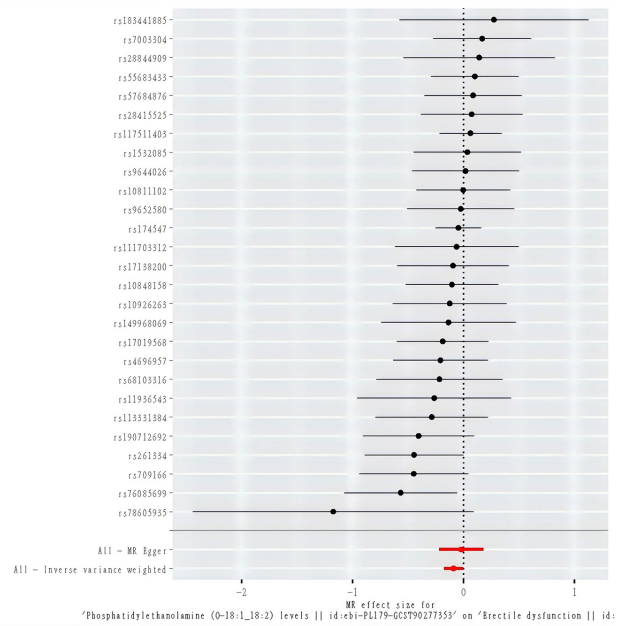


**Figure S4** Scatter plots for the effect of Circulating inflammatory proteins on ED. (A) Analysis for “Interleukin-17C levels” on “ED”. (B) Analysis for “Interleukin-1-alpha levels” on “ED”. (C) Analysis for “Interleukin-7 levels” on “ED”. (D) Analysis for “Leukemia inhibitory factor levels” on “ED”. (E) Analysis for “Tumor necrosis factor receptor superfamily member 9 levels” on “ED”. (F) Analysis for “Urokinase-type plasminogen activator levels” on “ED”. MR, Mendelian randomization; SNP, single nucleotide polymorphism.

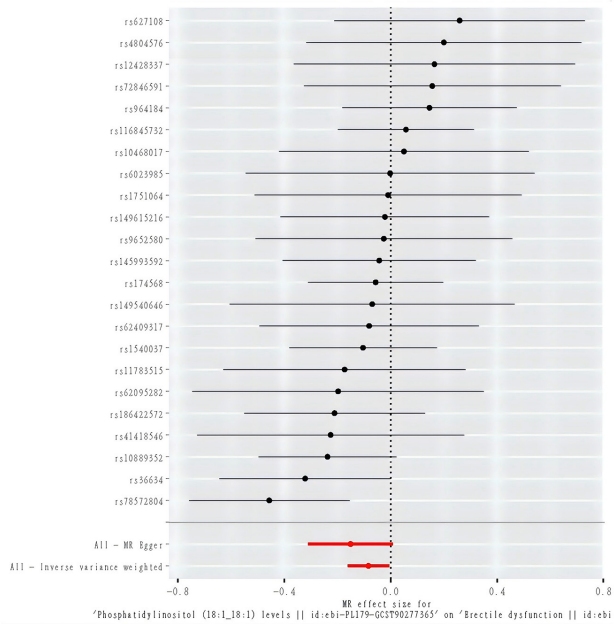
(A)



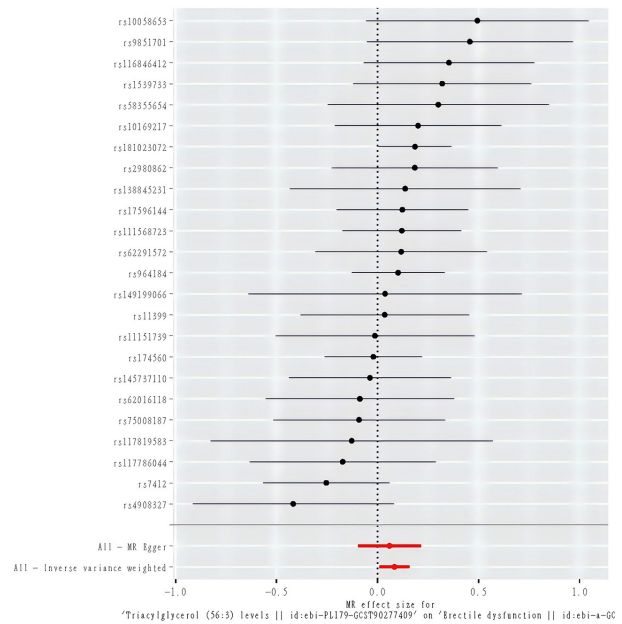
(B)



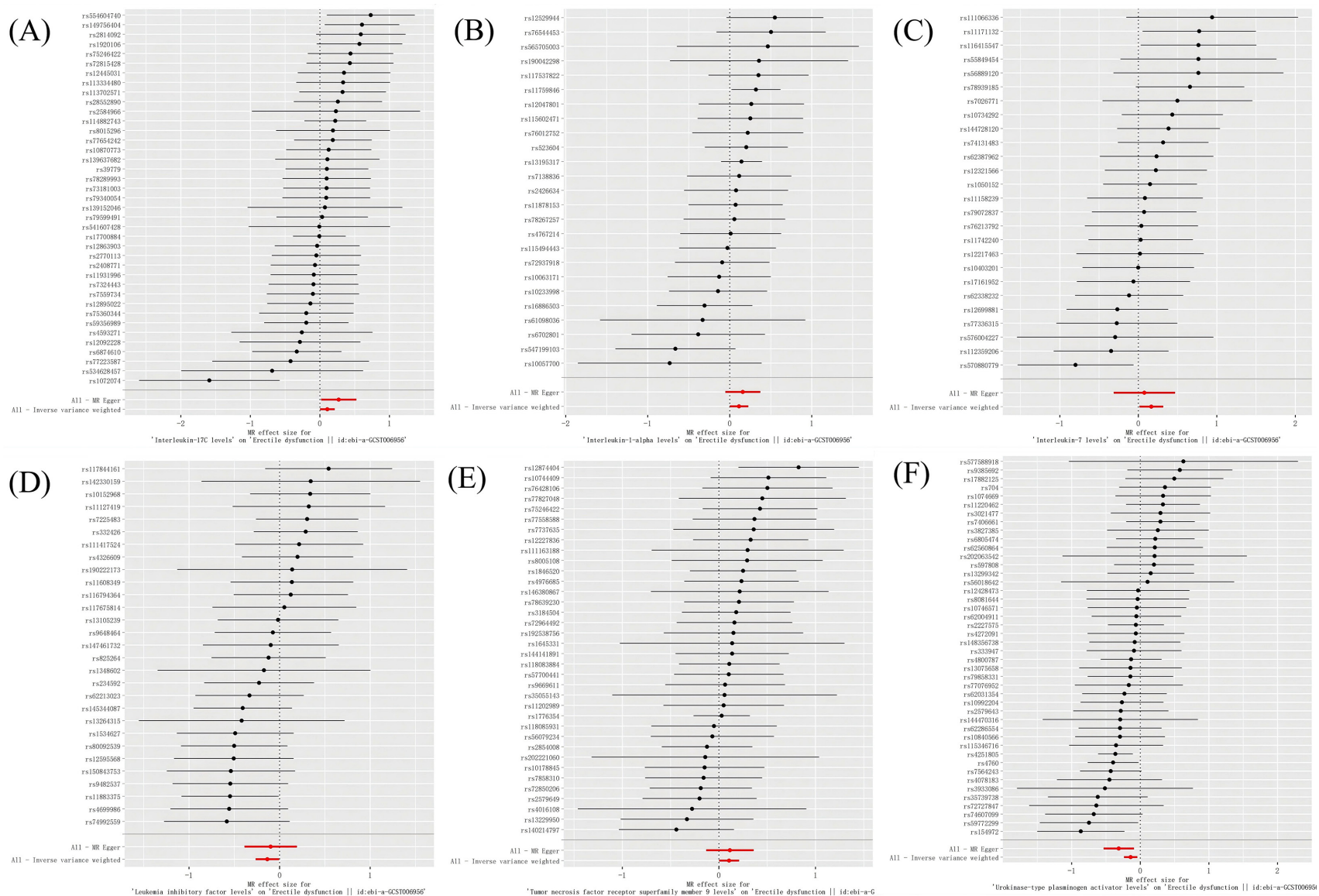
(C)



(D)



**Figure S5** Forest plots for the effect of Plasma lipidome on ED. (A) Analysis for “Ceramide (d42:2) levels” on “ED”. (B) Analysis for “Phosphatidylethanolamine (O-18:1\_18:2) levels” on “ED”. (C) Analysis for “Phosphatidylinositol (18:1\_18:1) levels” on “ED”. (D) Analysis for “Triacylglycerol (56:3) levels” on “ED”. MR, Mendelian randomization; ED, erectile dysfunction.



**Figure S6** Forest plots for the effect of Circulating inflammatory proteins on ED. (A) Analysis for “Interleukin-17C levels” on “ED”. (B) Analysis for “Interleukin-1-alpha levels” on “ED”. (C) Analysis for “Interleukin-7 levels” on “ED”. (D) Analysis for “Leukemia inhibitory factor levels” on “ED”. (E) Analysis for “Tumor necrosis factor receptor superfamily member 9 levels” on “ED”. (F) Analysis for “Urokinase-type plasminogen activator levels” on “ED”. MR, Mendelian randomization; ED, erectile dysfunction.