

Supplementary Materials

Causal relationships among seven cardiovascular-associated metabolic diseases: insights from a bidirectional Mendelian randomization study

Zihao Lai^{1,#}, Zeye Liu^{2,#}, Xuan Wang^{2,#}, Xianchao Jiang³, Yang Yang³, Xiaohan Fan^{1,4}, Yi Shi^{2,†}, Xiaofei Li^{1,†}

¹Cardiac Arrhythmia Center, National Center for Cardiovascular Disease, Fuwai Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100037, China.

²Department of Cardiac Surgery, Peking University People's Hospital, Peking University, Beijing 100037, China.

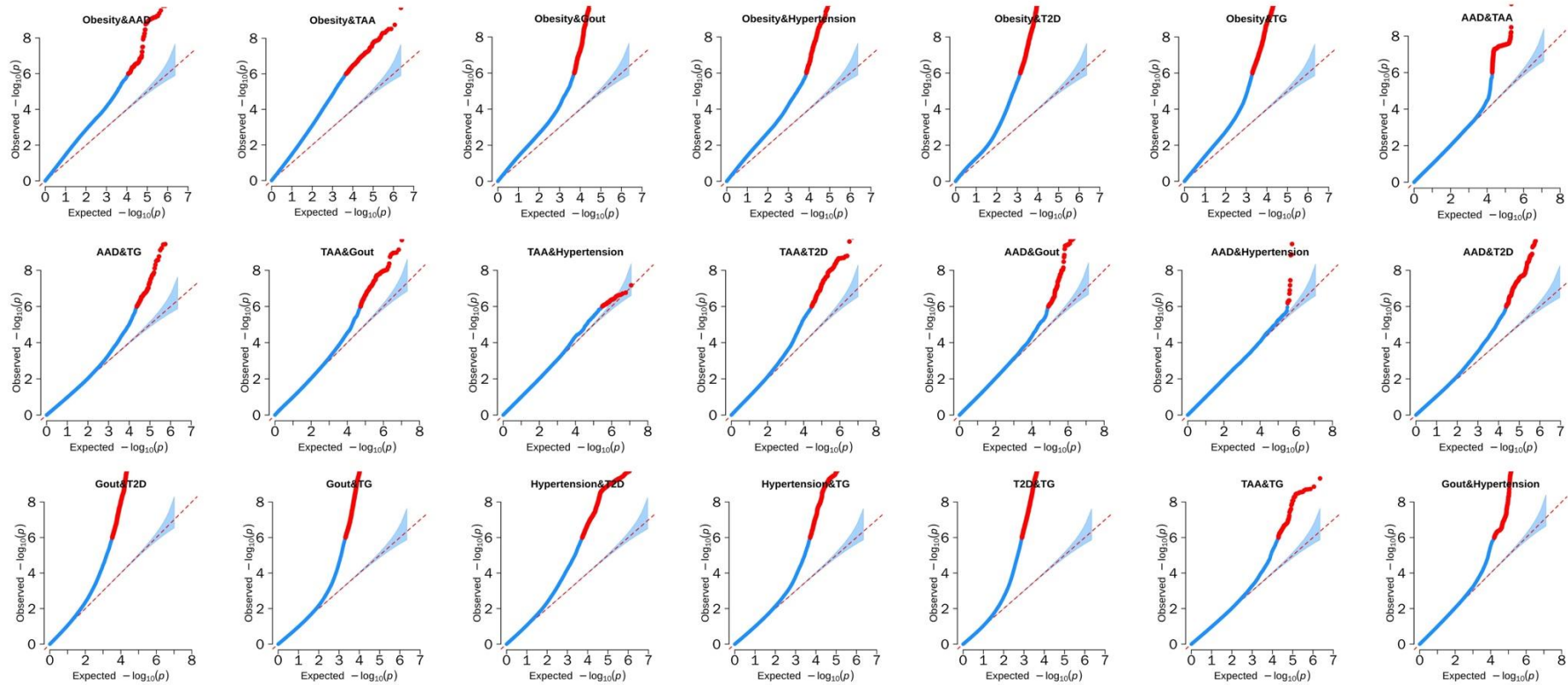
³Department of Cardiac Surgery, National Center for Cardiovascular Disease, Fuwai Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100037, China.

⁴Functional Test Center, National Center for Cardiovascular Disease, Fuwai Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100037, China.

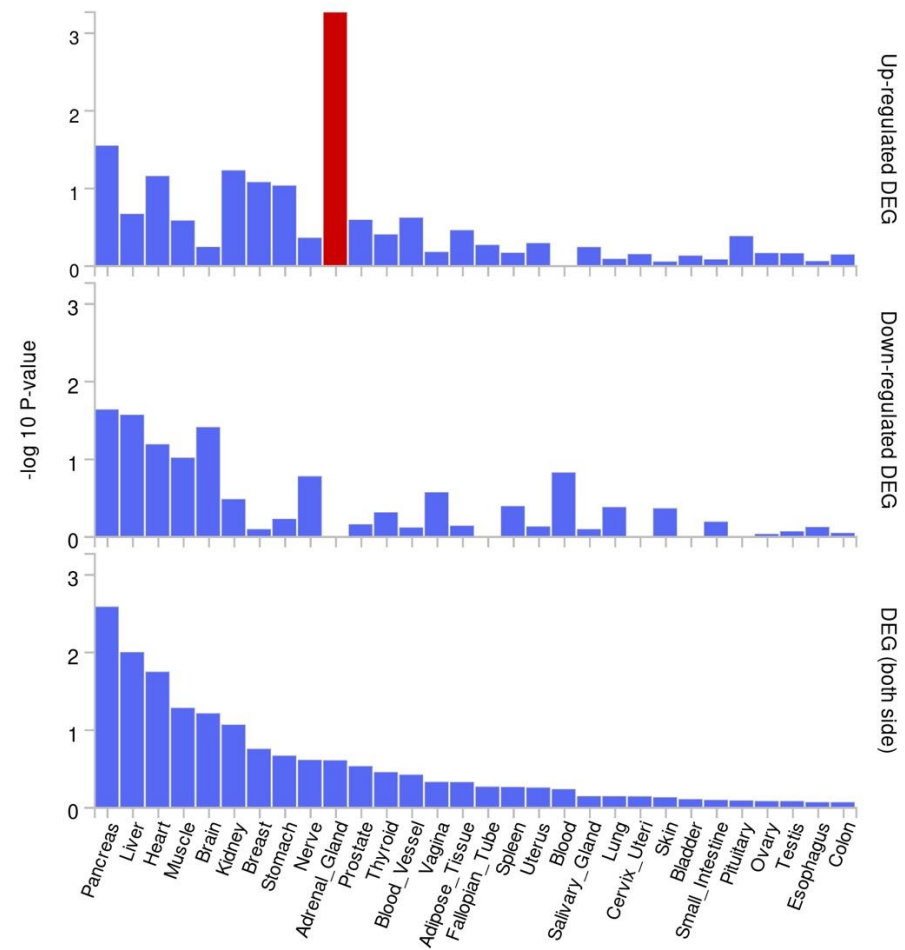
[#]Authors contributed equally.

[†]Joint senior authorship.

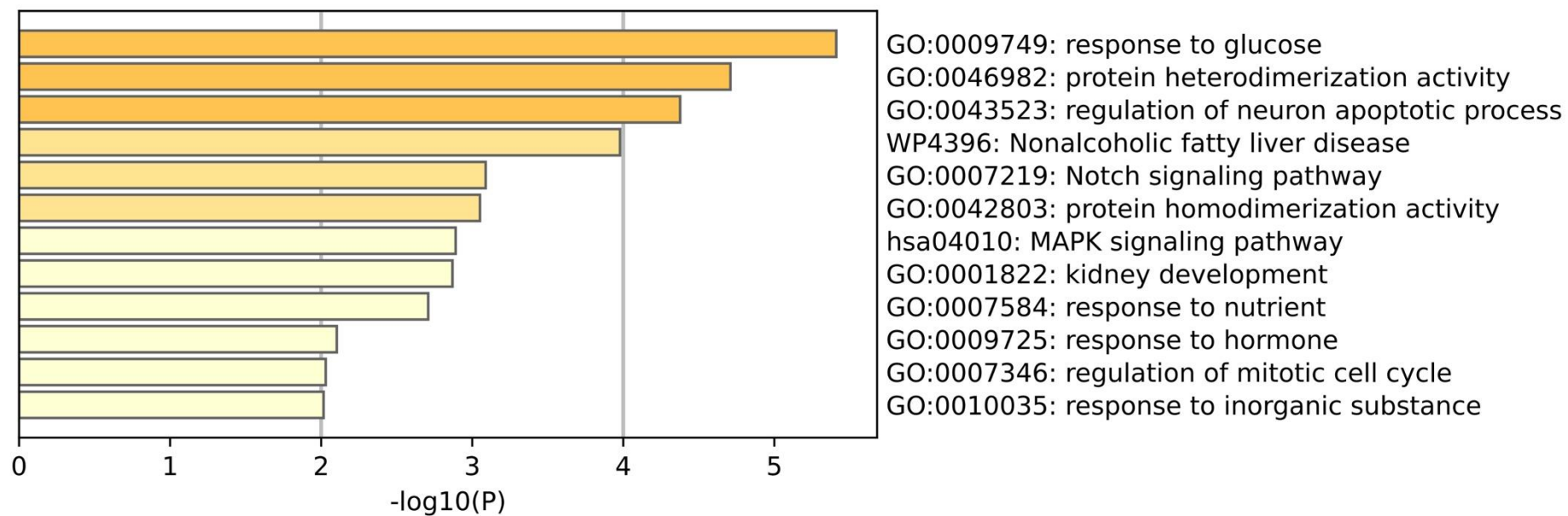
Correspondence to: Dr. Xiaofei Li, Cardiac Arrhythmia Center, National Center for Cardiovascular Disease, Fuwai Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, No.167 Beilishi Road, Xicheng district, Beijing 100037, China. E-mail: lixiaofei0103@163.com



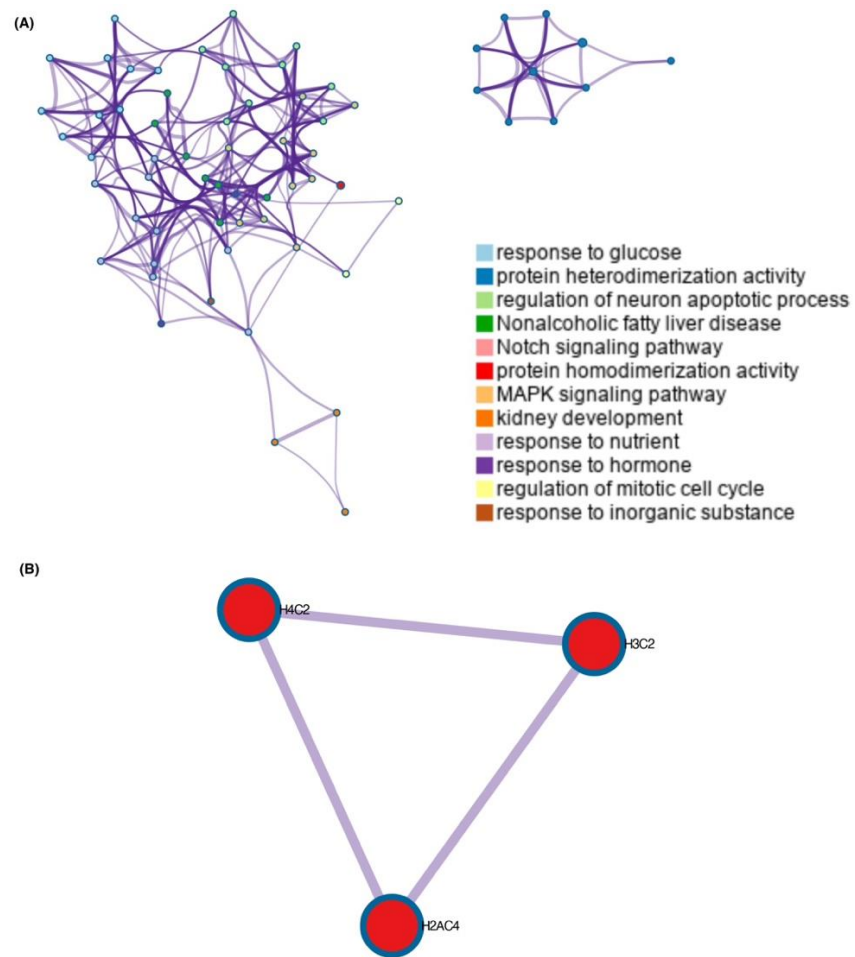
Supplementary Figure 1. The QQ plots of the PLACO analysis.



Supplementary Figure 2. The enrichment of differential expressions levels among identified pleiotropic genes across 30 common GTEx tissues.



Supplementary Figure 3. The result of the Gene Ontology analysis.



Supplementary Figure 4. The development of the Protein-protein interaction (PPI) networks and module analysis. **(A)** PPI network of the shared genes. **(B)** The identification of hub genes.

Supplementary Table 1. Genetic correlation analysis between paired metabolic disease traits

Methods	Trait 1	Trait 2	rg	Se	Z	P	Intercept	SE
With intercept	Obesity	AAD	0.0483	0.0879	0.5493	0.5828	-0.0006	0.0052
No intercept	Obesity	AAD	0.0511	0.0936	0.546	0.5851	0	/
With intercept	Obesity	TAA	-0.1005	0.09	-1.1171	0.264	0.0105	0.005
No intercept	Obesity	TAA	/	/	/	/	0	/
With intercept	Obesity	Gout	0.2632	0.0603	4.3669	1.26E-05	0.0149	0.005
No intercept	Obesity	Gout	0.6112	0.087	7.0285	2.09E-12	0	/
With intercept	Obesity	Hypertension	0.3906	0.0426	9.1592	5.23E-20	0.0036	0.0052
No intercept	Obesity	Hypertension	0.725	0.0612	11.8474	2.22E-32	0	/
With intercept	Obesity	T2D	0.5404	0.0296	18.2802	1.19E-74	0.0344	0.0067
No intercept	Obesity	T2D	1.161	0.0682	17.0324	4.72E-65	0	/
With intercept	Obesity	TG	0.2329	0.0335	6.9487	3.69E-12	0.1102	0.0053
No intercept	Obesity	TG	1.2408	0.1476	8.4037	4.32E-17	0	/
With intercept	AAD	Obesity	0.0483	0.0879	0.5493	0.5828	-0.0006	0.0052
No intercept	AAD	Obesity	0.0511	0.0936	0.546	0.5851	0	/
With intercept	AAD	TAA	0.4287	0.272	1.5762	0.115	0.0069	0.0049
No intercept	AAD	TAA	/	/	/	/	0	/
With intercept	AAD	Gout	-0.1472	0.0832	-1.7703	0.0767	0.0124	0.0044
No intercept	AAD	Gout	0.0127	0.0504	0.2513	0.8016	0	/
With intercept	AAD	Hypertension	0.0136	0.0962	0.1415	0.8875	0.0031	0.0047
No intercept	AAD	Hypertension	0.0506	0.0555	0.9116	0.362	0	/
With intercept	AAD	T2D	0.1337	0.0677	1.9762	0.0481	-0.0069	0.0054
No intercept	AAD	T2D	0.0654	0.037	1.7665	0.0773	0	/

With intercept	AAD	TG	0.126	0.0833	1.5132	0.1302	-0.0008	0.0059
No intercept	AAD	TG	0.1129	0.051	2.2125	0.0269	0	/
With intercept	TAA	Obesity	-0.1005	0.09	-1.1171	0.264	0.0105	0.005
No intercept	TAA	Obesity	/	/	/	/	0	/
With intercept	TAA	AAD	0.4287	0.272	1.5762	0.115	0.0069	0.0049
No intercept	TAA	AAD	/	/	/	/	0	/
With intercept	TAA	Gout	0.0293	0.1048	0.2796	0.7798	-0.007	0.0043
No intercept	TAA	Gout	/	/	/	/	0	/
With intercept	TAA	Hypertension	0.3065	0.1488	2.0592	0.0395	-0.0044	0.0044
No intercept	TAA	Hypertension	/	/	/	/	0	/
With intercept	TAA	T2D	-0.0089	0.0731	-0.1215	0.9033	0.0088	0.0056
No intercept	TAA	T2D	/	/	/	/	0	/
With intercept	TAA	TG	0.1777	0.0863	2.0604	0.0394	-0.0053	0.0051
No intercept	TAA	TG	/	/	/	/	0	/
With intercept	Gout	Obesity	0.2632	0.0603	4.3669	1.26E-05	0.0149	0.005
No intercept	Gout	Obesity	0.6112	0.087	7.0285	2.09E-12	0	/
With intercept	Gout	AAD	-0.1472	0.0832	-1.7703	0.0767	0.0124	0.0044
No intercept	Gout	AAD	0.0127	0.0504	0.2513	0.8016	0	/
With intercept	Gout	TAA	0.0293	0.1048	0.2796	0.7798	-0.007	0.0043
No intercept	Gout	TAA	/	/	/	/	0	/
With intercept	Gout	Hypertension	0.2431	0.054	4.5038	6.68E-06	0.0032	0.0055
No intercept	Gout	Hypertension	0.2561	0.0373	6.8712	6.37E-12	0	/
With intercept	Gout	T2D	0.2607	0.0482	5.4072	6.40E-08	0.0458	0.0065
No intercept	Gout	T2D	0.3959	0.0469	8.4445	3.05E-17	0	/
With intercept	Gout	TG	0.2843	0.068	4.1819	2.89E-05	0.0037	0.0094

No intercept	Gout	TG	0.3569	0.0501	7.1179	1.10E-12	0	/
With intercept	Hypertension	Obesity	0.3906	0.0426	9.1592	5.23E-20	0.0036	0.0052
No intercept	Hypertension	Obesity	0.725	0.0612	11.8474	2.22E-32	0	/
With intercept	Hypertension	AAD	0.0136	0.0962	0.1415	0.8875	0.0031	0.0047
No intercept	Hypertension	AAD	0.0506	0.0555	0.9116	0.362	0	/
With intercept	Hypertension	TAA	0.3065	0.1488	2.0592	0.0395	-0.0044	0.0044
No intercept	Hypertension	TAA	/	/	/	/	0	/
With intercept	Hypertension	Gout	0.2431	0.054	4.5038	6.68E-06	0.0032	0.0055
No intercept	Hypertension	Gout	0.2561	0.0373	6.8712	6.37E-12	0	/
With intercept	Hypertension	T2D	0.5188	0.0337	15.4077	1.45E-53	0.0481	0.0066
No intercept	Hypertension	T2D	0.694	0.0268	25.8732	1.33E-147	0	/
With intercept	Hypertension	TG	0.2177	0.035	6.2276	4.74E-10	-0.0008	0.0054
No intercept	Hypertension	TG	0.2466	0.0303	8.144	3.82E-16	0	/
With intercept	T2D	Obesity	0.5404	0.0296	18.2802	1.19E-74	0.0344	0.0067
No intercept	T2D	Obesity	1.161	0.0682	17.0324	4.72E-65	0	/
With intercept	T2D	AAD	0.1337	0.0677	1.9762	0.0481	-0.0069	0.0054
No intercept	T2D	AAD	0.0654	0.037	1.7665	0.0773	0	/
With intercept	T2D	TAA	-0.0089	0.0731	-0.1215	0.9033	0.0088	0.0056
No intercept	T2D	TAA	/	/	/	/	0	/
With intercept	T2D	Gout	0.2607	0.0482	5.4072	6.40E-08	0.0458	0.0065
No intercept	T2D	Gout	0.3959	0.0469	8.4445	3.05E-17	0	/
With intercept	T2D	Hypertension	0.5188	0.0337	15.4077	1.45E-53	0.0481	0.0066
No intercept	T2D	Hypertension	0.694	0.0268	25.8732	1.33E-147	0	/

With intercept	T2D	TG	0.3383	0.0486	6.9653	3.28E-12	0.0157	0.0094
No intercept	T2D	TG	0.4373	0.049	8.9312	4.22E-19	0	/
With intercept	TG	Obesity	0.2329	0.0335	6.9487	3.69E-12	0.1102	0.0053
No intercept	TG	Obesity	1.2408	0.1476	8.4037	4.32E-17	0	/
With intercept	TG	AAD	0.126	0.0833	1.5132	0.1302	-0.0008	0.0059
No intercept	TG	AAD	0.1129	0.051	2.2125	0.0269	0	/
With intercept	TG	TAA	0.1777	0.0863	2.0604	0.0394	-0.0053	0.0051
No intercept	TG	TAA	/	/	/	/	0	/
With intercept	TG	Gout	0.2843	0.068	4.1819	2.89E-05	0.0037	0.0094
No intercept	TG	Gout	0.3569	0.0501	7.1179	1.10E-12	0	/
With intercept	TG	Hypertension	0.2177	0.035	6.2276	4.74E-10	-0.0008	0.0054
No intercept	TG	Hypertension	0.2466	0.0303	8.144	3.82E-16	0	/
With intercept	TG	T2D	0.3383	0.0486	6.9653	3.28E-12	0.0157	0.0094
No intercept	TG	T2D	0.4373	0.049	8.9312	4.22E-19	0	/

AAD: Acute aortic dissection; TAA: thoracic aortic aneurysm; TG: triglyceride; T2D: type 2 diabetes.

Supplementary Table 2. Significant pleiotropic genes identified between trait pairs via the PLACO method

Trait 1	Trait 2	Gene	P.x	P.y	T.placo	p.placo
Obesity	AAD	ANKDD1B	3.78E-06	0.00046683	14.81929852	6.25E-07
Obesity	AAD	CCDC101	8.58E-07	2.32E-05	19.48542588	9.45E-09
Obesity	AAD	NUPR1	1.05E-06	0.0024558	13.34336064	2.37E-06
Obesity	AAD	POC5	1.34E-07	0.0040119	13.64070483	1.81E-06
Obesity	AAD	SULT1A1	1.30E-06	0.0011679	14.30464248	9.94E-07
Obesity	AAD	SULT1A2	9.95E-07	0.00037978	16.00854024	2.14E-07
Obesity	TAA	TCF7L2	6.73E-05	4.32E-07	18.78597695	1.64E-08
Obesity	Gout	BDNF	8.09E-13	0.013715	15.5782392	4.12E-07
Obesity	Gout	NRXN2	0.019585	4.69E-13	14.72409232	8.87E-07
Obesity	Gout	PPM1K	6.93E-05	5.00E-10	23.28047964	4.13E-10
Obesity	Gout	SLC22A12	0.0106	5.00E-10	14.07850136	1.59E-06
Obesity	Gout	TBL2	0.97247	1.95E-13	-13.92624112	1.82E-06
Obesity	Gout	TFAP2B	5.49E-08	0.0010957	16.2639174	2.22E-07
Obesity	Hypertension	CAC/1D	0.00020653	2.40E-05	14.35524768	1.11E-06
Obesity	Hypertension	IPO9	1.04E-05	9.19E-05	15.91866522	2.70E-07
Obesity	Hypertension	KCNK3	0.00029001	5.00E-10	21.02122352	2.76E-09
Obesity	Hypertension	SHISA4	7.29E-06	0.00015801	15.61416318	3.56E-07
Obesity	T2D	ANKDD1B	3.78E-06	1.61E-10	28.1516525	2.39E-09
Obesity	T2D	ATP2A1	1.18E-07	9.70E-08	26.9010015	5.47E-09
Obesity	T2D	ATXN2L	1.39E-07	7.38E-06	22.25754394	1.20E-07
Obesity	T2D	BCDIN3D	3.39E-10	8.55E-06	26.5328316	6.98E-09
Obesity	T2D	BDNF	8.09E-13	6.50E-06	30.8011592	4.15E-10

Obesity	T2D	BPTF	0.00068064	1.28E-11	21.36329008	2.17E-07
Obesity	T2D	C16orf92	0.00098229	1.17E-09	18.4881833	1.49E-06
Obesity	T2D	C17orf58	0.00040502	2.61E-09	19.56058186	7.24E-07
Obesity	T2D	CCND1	0.0017883	3.17E-12	20.0201976	5.32E-07
Obesity	T2D	DENND1A	1.38E-05	1.85E-07	21.30817694	2.25E-07
Obesity	T2D	DOC2A	0.00086884	1.39E-09	18.61667192	1.36E-06
Obesity	T2D	EHBP1L1	0.00099555	3.05E-10	19.1308208	9.66E-07
Obesity	T2D	ETV5	3.39E-09	0.00022288	20.35277668	4.26E-07
Obesity	T2D	FAIM2	6.94E-08	0.00036356	17.79670597	2.37E-06
Obesity	T2D	FAM57B	0.0012178	2.55E-09	17.71342344	2.50E-06
Obesity	T2D	FTO	3.92E-09	7.09E-15	44.41149999	5.40E-14
Obesity	T2D	GIPR	1.66E-06	9.94E-15	35.57824486	1.78E-11
Obesity	T2D	HMGA2	0.0051697	1.29E-14	19.53355525	7.37E-07
Obesity	T2D	HNF1B	0.99046	3.68E-16	-18.90376004	1.12E-06
Obesity	T2D	INO80E	0.0010268	4.16E-09	17.76048056	2.42E-06
Obesity	T2D	IPO9	1.04E-05	5.99E-06	18.63235458	1.35E-06
Obesity	T2D	LAT	3.32E-06	4.07E-05	17.75071392	2.44E-06
Obesity	T2D	LIN7C	1.91E-09	0.00022334	20.68481844	3.41E-07
Obesity	T2D	LMX1B	1.54E-05	4.22E-06	18.56210226	1.41E-06
Obesity	T2D	MAP2K5	1.43E-09	3.04E-05	23.81760303	4.23E-08
Obesity	T2D	MC4R	5.39E-05	2.70E-11	25.40088925	1.48E-08
Obesity	T2D	MIR642A	1.40E-06	1.01E-13	34.41816056	3.83E-11
Obesity	T2D	MRPS35	0.99306	2.64E-13	-17.7584454	2.43E-06
Obesity	T2D	MSRA	0.0059658	5.47E-14	18.67824322	1.31E-06
Obesity	T2D	MTCH2	6.34E-05	1.27E-07	19.75641869	6.35E-07

Obesity	T2D	NEGR1	5.08E-07	8.17E-05	18.42829032	1.55E-06
Obesity	T2D	NRXN3	6.34E-05	2.68E-09	22.36532025	1.11E-07
Obesity	T2D	POC5	1.34E-07	2.06E-12	35.67339396	1.67E-11
Obesity	T2D	QPCTL	0.00010135	4.53E-13	26.54461796	6.93E-09
Obesity	T2D	RABEP2	2.90E-07	6.99E-07	24.11443675	3.47E-08
Obesity	T2D	SEC16B	7.41E-07	3.56E-12	32.99819072	9.75E-11
Obesity	T2D	SH2B1	2.86E-08	4.81E-06	24.02092932	3.70E-08
Obesity	T2D	SHISA4	7.29E-06	8.64E-06	18.62965874	1.35E-06
Obesity	T2D	SKOR1	7.24E-10	6.48E-06	26.38388109	7.71E-09
Obesity	T2D	SNORA70F	0.0041961	7.57E-13	18.64424788	1.34E-06
Obesity	T2D	SNRPD2	9.47E-07	1.16E-11	31.8506825	2.08E-10
Obesity	T2D	SPNS1	1.71E-06	3.10E-05	18.5981462	1.38E-06
Obesity	T2D	STK33	1.50E-06	7.55E-05	17.69754672	2.53E-06
Obesity	T2D	TFAP2B	5.49E-08	4.36E-10	32.55597674	1.30E-10
Obesity	T2D	TRIM66	2.27E-08	6.70E-06	23.80896768	4.26E-08
Obesity	T2D	TUFM	6.75E-08	1.09E-05	22.38195408	1.10E-07
Obesity	T2D	ZC3H4	0.0001852	2.80E-08	19.33741342	8.41E-07
Obesity	TG	AFF1	0.0036046	1.29E-14	20.4682225	2.00E-08
Obesity	TG	APOC1P1	0.0097793	1.13E-14	17.82450062	1.79E-07
Obesity	TG	BCKDK	1.91E-05	2.81E-07	20.60579434	1.79E-08
Obesity	TG	BDNF	8.09E-13	0.0039652	18.75492	8.27E-08
Obesity	TG	BRE	0.022611	1.64E-18	17.4256239	2.50E-07
Obesity	TG	CILP2	0.0045735	6.06E-12	17.6689422	2.04E-07
Obesity	TG	FTO	3.92E-09	0.0037852	15.41390202	1.34E-06
Obesity	TG	FZD9	0.99559	3.05E-12	-18.01148475	1.53E-07

Obesity	TG	GATAD2A	0.0063858	2.99E-14	18.69741387	8.68E-08
Obesity	TG	GIPR	1.66E-06	0.00021203	16.38903754	5.92E-07
Obesity	TG	HAPLN4	0.0097561	3.75E-11	15.20545668	1.59E-06
Obesity	TG	HSD17B13	0.0013608	3.45E-08	16.16845488	7.12E-07
Obesity	TG	KAT8	2.35E-05	3.22E-07	20.25824346	2.38E-08
Obesity	TG	KLHL8	0.0074115	4.51E-10	14.92649319	2.01E-06
Obesity	TG	LIN7C	1.91E-09	0.00031078	20.1610552	2.58E-08
Obesity	TG	MAU2	0.017478	8.88E-16	16.7784084	4.28E-07
Obesity	TG	MIR642A	1.40E-06	0.00059371	15.18635636	1.62E-06
Obesity	TG	PRSS36	3.40E-05	2.85E-07	19.9201779	3.15E-08
Obesity	TG	PRSS53	7.97E-06	2.96E-07	21.54938144	8.18E-09
Obesity	TG	PRSS8	4.37E-05	1.93E-05	16.14669498	7.25E-07
Obesity	TG	REEP3	0.0096804	1.13E-10	14.8321701	2.17E-06
Obesity	TG	SNORA70F	0.0041961	2.30E-10	16.42745598	5.73E-07
Obesity	TG	SNRPD2	9.47E-07	0.00018843	16.9416091	3.74E-07
Obesity	TG	STX1B	0.0001084	1.63E-05	15.36842272	1.39E-06
Obesity	TG	STX4	8.08E-06	4.29E-07	21.22341568	1.07E-08
Obesity	TG	TM6SF2	0.012428	1.20E-14	17.11261028	3.24E-07
Obesity	TG	VKORC1	1.11E-05	3.26E-06	19.12094583	6.11E-08
Obesity	TG	ZNF646	9.36E-06	1.07E-07	22.19477085	4.80E-09
Obesity	TG	ZNF664	0.0020127	1.32E-09	17.12173098	3.22E-07
Obesity	TG	ZNF668	1.13E-05	3.29E-08	22.89525475	2.70E-09
AAD	TAA	FBN1	2.38E-06	2.35E-05	18.6232001	3.12E-09
AAD	TAA	ULK4	0.00056866	0.00013793	11.8355254	2.62E-06
AAD	Gout	HIST1H1A	0.9796	4.45E-14	-15.2516571	2.61E-07

AAD	Gout	HIST1H1C	0.99483	9.10E-12	-17.22889522	4.13E-08
AAD	Gout	HIST1H2AA	0.98964	5.00E-10	-14.1310422	7.43E-07
AAD	Gout	HIST1H2AB	0.99674	1.28E-15	-21.5195022	7.67E-10
AAD	Gout	HIST1H2APS1	0.98777	5.00E-10	-13.74615	1.06E-06
AAD	Gout	HIST1H2BA	0.99171	5.00E-10	-14.63628958	4.63E-07
AAD	Gout	HIST1H2BB	0.98875	6.44E-15	-17.5850619	2.96E-08
AAD	Gout	HIST1H3A	0.98312	1.04E-14	-16.23126882	1.05E-07
AAD	Gout	HIST1H3B	0.99768	2.55E-15	-22.15265746	4.26E-10
AAD	Gout	HIST1H3C	0.99224	1.64E-13	-17.62583256	2.85E-08
AAD	Gout	HIST1H4A	0.98634	4.94E-15	-17.08317152	4.73E-08
AAD	Gout	HIST1H4B	0.97929	1.11E-16	-16.74163335	6.50E-08
AAD	Gout	SCGN	0.99996	1.60E-11	-26.08051068	1.13E-11
AAD	Gout	SLC16A9	0.99721	1.34E-11	-18.4645585	1.31E-08
AAD	Gout	SLC17A4	0.98158	1.05E-14	-15.95664125	1.35E-07
AAD	Gout	TRIM38	0.99563	5.10E-13	-18.69220496	1.06E-08
AAD	Hypertension	KCNK3	0.016677	5.00E-10	12.99958132	1.66E-06
AAD	T2D	ANKDD1B	0.00046683	1.61E-10	20.8103675	3.29E-07
AAD	T2D	POC5	0.0040119	2.06E-12	18.38060652	1.66E-06
AAD	TG	APOB	0.0084818	5.00E-10	14.5861925	2.23E-06
AAD	TG	APOC1	0.017502	5.83E-14	15.64464015	9.30E-07
AAD	TG	PLTP	0.99395	6.33E-15	-19.34392464	4.46E-08
TAA	Gout	SLC22A11	0.0037009	5.00E-10	16.36219508	7.87E-08
TAA	T2D	ACSL1	0.99877	4.48E-15	-23.47854306	5.60E-08
TAA	TG	PINX1	0.99451	3.42E-09	-14.7390738	1.90E-06
TAA	TG	TRIB1	0.97773	1.17E-14	-15.3304781	1.17E-06

Gout	Hypertension	AP5B1	4.30E-14	0.0057502	18.85444039	1.12E-08
Gout	Hypertension	ARID1A	9.80E-05	7.08E-05	14.17132584	8.67E-07
Gout	Hypertension	C17orf82	0.0001483	5.59E-06	15.89511442	1.74E-07
Gout	Hypertension	GPATCH3	1.82E-05	0.00023907	14.42205684	6.86E-07
Gout	Hypertension	HIST1H2AB	1.28E-15	0.011799	17.9073396	2.69E-08
Gout	Hypertension	HIST1H2BB	6.44E-15	0.014644	16.7981772	7.53E-08
Gout	Hypertension	HIST1H3B	2.55E-15	0.027673	14.99194962	4.04E-07
Gout	Hypertension	HIST1H3C	1.64E-13	0.017453	15.36233832	2.86E-07
Gout	Hypertension	HIST1H4B	1.11E-16	0.039128	14.45610855	6.65E-07
Gout	Hypertension	INSR	2.06E-07	3.35E-05	20.18647208	3.24E-09
Gout	Hypertension	KAT5	2.61E-13	0.0048962	18.64920707	1.35E-08
Gout	Hypertension	MRPL33	4.95E-11	0.0076002	15.70317336	2.08E-07
Gout	Hypertension	NR0B2	1.66E-05	9.17E-05	15.5247759	2.46E-07
Gout	Hypertension	NUDC	3.63E-05	0.00013049	14.486136	6.47E-07
Gout	Hypertension	OVOL1	8.98E-13	0.014981	15.30142764	3.03E-07
Gout	Hypertension	PCNXL3	4.19E-11	0.0050039	16.72491616	8.06E-08
Gout	Hypertension	RELA	1.67E-13	0.021284	14.76331479	5.00E-07
Gout	Hypertension	R/SEH2C	2.94E-14	0.0054945	19.1002187	8.88E-09
Gout	Hypertension	TBX2	2.88E-05	2.00E-06	18.54993536	1.48E-08
Gout	Hypertension	ZDHHC18	6.43E-06	0.00088705	13.63586625	1.43E-06
Gout	T2D	AP5B1	4.30E-14	0.0024452	20.99646478	2.69E-07
Gout	T2D	ATP6V1G2-DDX39B	0.011567	4.10E-15	17.6347324	2.56E-06
Gout	T2D	BPTF	0.0011659	1.28E-11	20.30669872	4.26E-07
Gout	T2D	BTAf1	0.0059131	1.01E-12	17.70517782	2.44E-06
Gout	T2D	C12orf43	0.0078413	5.02E-14	17.97725286	2.03E-06

Gout	T2D	C2orf16	7.27E-15	9.92E-08	40.00272235	9.24E-13
Gout	T2D	CCDC121	2.83E-14	2.09E-05	30.7926423	4.01E-10
Gout	T2D	CCHCR1	0.01087	3.51E-15	17.86327211	2.19E-06
Gout	T2D	CCND1	0.0035857	3.17E-12	18.4774336	1.45E-06
Gout	T2D	D/JC5G	5.00E-10	4.82E-05	23.82482718	4.07E-08
Gout	T2D	EHBP1L1	0.00033603	3.05E-10	21.0435316	2.60E-07
Gout	T2D	EIF2B4	1.03E-14	1.56E-10	48.11407195	4.49E-15
Gout	T2D	FAM89B	0.00085278	6.06E-11	20.19666616	4.59E-07
Gout	T2D	FNDC4	5.00E-10	3.97E-09	35.25001612	2.11E-11
Gout	T2D	FTH1P3	5.00E-10	7.22E-09	34.62930108	3.18E-11
Gout	T2D	FZD9	1.05E-06	0.00010291	17.60840802	2.60E-06
Gout	T2D	GCKR	5.00E-10	8.96E-14	44.9865669	3.50E-14
Gout	T2D	GPN1	7.99E-11	0.0014729	19.01633481	1.01E-06
Gout	T2D	GTF3C2	7.22E-16	5.00E-10	48.76339798	2.93E-15
Gout	T2D	HIST1H2AB	1.28E-15	0.0043397	20.7616284	3.14E-07
Gout	T2D	HIST1H3B	2.55E-15	0.0036381	20.99937038	2.68E-07
Gout	T2D	HIST1H4B	1.11E-16	0.0084529	19.6108536	6.79E-07
Gout	T2D	HIST1H4C	5.00E-10	0.00090355	19.06254988	9.81E-07
Gout	T2D	HNF4A	0.00021366	7.45E-08	18.50703588	1.42E-06
Gout	T2D	IFT172	7.51E-12	2.70E-09	39.36810611	1.40E-12
Gout	T2D	INSR	2.06E-07	3.38E-07	25.1539776	1.68E-08
Gout	T2D	KAT5	2.61E-13	0.00011064	26.66523998	6.17E-09
Gout	T2D	KRTCAP2	4.00E-09	0.00097596	17.86792875	2.19E-06
Gout	T2D	KRTCAP3	7.22E-16	1.11E-08	44.64324444	4.38E-14
Gout	T2D	MAP3K11	1.15E-06	1.93E-08	25.9760735	9.75E-09

Gout	T2D	MLXIPL	9.62E-14	0.0021769	20.9684602	2.74E-07
Gout	T2D	MPV17	1.93E-11	7.93E-07	31.72644188	2.16E-10
Gout	T2D	MRPL33	4.95E-11	0.002547	18.1185486	1.85E-06
Gout	T2D	MTX1	5.00E-10	0.0012998	18.3984581	1.53E-06
Gout	T2D	NRBP1	1.27E-13	1.00E-08	41.05800305	4.62E-13
Gout	T2D	OVOL1	8.98E-13	0.0001121	26.01299094	9.51E-09
Gout	T2D	PCNXL3	4.19E-11	3.08E-07	32.37838832	1.41E-10
Gout	T2D	PNPLA3	5.15E-12	3.54E-07	33.7331016	5.75E-11
Gout	T2D	PPM1G	5.00E-10	1.45E-09	36.27089686	1.08E-11
Gout	T2D	RELA	1.67E-13	5.79E-06	31.92615054	1.90E-10
Gout	T2D	RFT1	7.04E-08	2.91E-07	26.30523411	7.84E-09
Gout	T2D	R/SEH2C	2.94E-14	0.0008882	23.47381577	5.15E-08
Gout	T2D	RREB1	1.18E-08	6.84E-14	41.3102919	3.91E-13
Gout	T2D	SAMM50	1.15E-06	1.95E-07	23.97779883	3.68E-08
Gout	T2D	SFMBT1	1.44E-08	4.11E-05	21.84865057	1.52E-07
Gout	T2D	SIPA1	1.81E-11	8.38E-07	31.69533465	2.21E-10
Gout	T2D	SLC30A3	9.00E-09	0.00028857	19.37971142	7.93E-07
Gout	T2D	SNX17	5.00E-10	5.85E-10	37.17081148	5.96E-12
Gout	T2D	SSSCA1	0.0033801	2.61E-11	17.78010432	2.32E-06
Gout	T2D	TFAP2B	0.0010957	4.36E-10	18.7801719	1.19E-06
Gout	T2D	THBS3	5.00E-10	0.00173	17.86144184	2.20E-06
Gout	T2D	TRIM46	5.00E-10	0.0010205	18.84261148	1.14E-06
Gout	T2D	TRIM54	4.04E-10	1.16E-05	25.99783127	9.61E-09
Gout	T2D	UBE2Q2	2.60E-09	0.00031738	19.95255852	5.40E-07
Gout	T2D	UCN	2.00E-09	3.78E-06	26.34415182	7.64E-09

Gout	T2D	WWP2	0.00032932	1.98E-08	18.70753164	1.24E-06
Gout	T2D	ZNF512	4.65E-15	4.82E-08	41.32686624	3.87E-13
Gout	T2D	ZNF513	8.05E-15	1.15E-09	45.8775018	1.95E-14
Gout	TG	AFF1	0.0061721	1.29E-14	19.05974675	3.92E-08
Gout	TG	APOA5	0.0050093	5.00E-10	15.73292688	6.55E-07
Gout	TG	ARID1A	9.80E-05	3.83E-06	16.66318806	2.97E-07
Gout	TG	BAZ1B	5.61E-08	5.00E-10	32.41525452	5.57E-13
Gout	TG	BCL7B	2.03E-05	5.00E-10	25.07481042	2.51E-10
Gout	TG	BRE	1.46E-07	1.64E-18	44.6317338	2.29E-17
Gout	TG	C2orf16	7.27E-15	1.69E-13	55.9818136	2.01E-21
Gout	TG	CAD	8.33E-08	8.88E-15	40.11642129	9.51E-16
Gout	TG	CCDC121	2.83E-14	5.00E-10	45.91763946	7.95E-18
Gout	TG	D/JC5G	5.00E-10	5.77E-15	47.1706774	2.83E-18
Gout	TG	EIF2B4	1.03E-14	5.00E-10	46.7155271	4.12E-18
Gout	TG	FADS1	0.0053247	5.00E-10	15.6034076	7.31E-07
Gout	TG	FEN1	0.0083043	5.00E-10	14.63384582	1.67E-06
Gout	TG	FNDC4	5.00E-10	7.15E-12	41.26716418	3.68E-16
Gout	TG	FTH1P3	5.00E-10	1.33E-10	38.59674544	3.34E-15
Gout	TG	FZD9	1.05E-06	3.05E-12	32.62617225	4.68E-13
Gout	TG	GCKR	5.00E-10	5.00E-10	37.32476836	9.55E-15
Gout	TG	GPATCH3	1.82E-05	1.10E-06	19.551762	2.59E-08
Gout	TG	GPN1	7.99E-11	5.00E-10	39.07388958	2.25E-15
Gout	TG	GTF3C2	7.22E-16	5.00E-10	48.76339798	7.63E-19
Gout	TG	IFT172	7.51E-12	5.00E-10	41.22439838	3.81E-16
Gout	TG	INHBC	1.73E-12	2.76E-07	34.8391805	7.47E-14

Gout	TG	INHBE	5.00E-08	1.59E-05	22.15694132	2.89E-09
Gout	TG	INSR	2.06E-07	7.88E-07	24.30994216	4.76E-10
Gout	TG	JMJD1C	0.001775	5.05E-09	16.70318084	2.87E-07
Gout	TG	KLHL8	0.0056113	4.51E-10	15.53293749	7.76E-07
Gout	TG	KRTCAP3	7.22E-16	5.00E-10	48.76339798	7.63E-19
Gout	TG	LRP1	2.59E-06	0.00066929	14.61735396	1.69E-06
Gout	TG	MAP3K11	1.15E-06	0.00054184	15.4419889	8.38E-07
Gout	TG	MIR1236	0.0044998	1.35E-11	17.40128778	1.59E-07
Gout	TG	MIR1296	0.00057393	5.18E-10	19.84618055	2.02E-08
Gout	TG	MIR1908	0.0047971	1.56E-13	18.87872088	4.56E-08
Gout	TG	MIR611	0.0088761	4.11E-15	18.40658894	6.80E-08
Gout	TG	MIR92B	2.00E-09	0.0057606	14.8664313	1.37E-06
Gout	TG	MLXIPL	9.62E-14	5.00E-10	44.9285276	1.80E-17
Gout	TG	MPV17	1.93E-11	5.44E-15	51.0807479	1.13E-19
Gout	TG	MRPL33	4.95E-11	6.00E-15	49.91236446	2.96E-19
Gout	TG	MSH5	0.01434	5.86E-12	14.84183844	1.40E-06
Gout	TG	MTX1	5.00E-10	0.0006955	19.5286971	2.64E-08
Gout	TG	NBPF10	1.16E-10	0.0061032	15.88666912	5.75E-07
Gout	TG	NDUFA4L2	5.59E-07	2.47E-05	19.76319048	2.16E-08
Gout	TG	NR0B2	1.66E-05	6.38E-06	18.1101636	8.73E-08
Gout	TG	NRBP1	1.27E-13	6.53E-12	49.51880365	4.10E-19
Gout	TG	NUDC	3.63E-05	7.10E-05	15.09514725	1.13E-06
Gout	TG	NXPH4	3.12E-05	9.47E-06	17.1229695	2.01E-07
Gout	TG	OVOL1	8.98E-13	0.0054159	17.96257614	9.89E-08
Gout	TG	PCNXL3	4.19E-11	0.0023309	18.3736412	6.99E-08

Gout	TG	PPM1G	5.00E-10	5.00E-10	37.32476836	9.55E-15
Gout	TG	PSORS1C1	0.0071103	8.62E-12	16.49338416	3.43E-07
Gout	TG	PSORS1C2	0.0064066	1.71E-09	14.70865233	1.56E-06
Gout	TG	R3HDM2	7.42E-11	6.27E-05	24.5734078	3.82E-10
Gout	TG	RBKS	4.31E-07	5.00E-10	30.06252458	3.93E-12
Gout	TG	REEP3	0.0010656	1.13E-10	19.48002738	2.75E-08
Gout	TG	RELA	1.67E-13	0.001399	21.76094691	4.03E-09
Gout	TG	SFN	3.10E-05	4.63E-05	15.65751876	6.98E-07
Gout	TG	SHMT2	3.45E-07	7.31E-06	21.51602455	4.95E-09
Gout	TG	SIPA1	1.81E-11	0.0013069	19.9203613	1.90E-08
Gout	TG	SKIV2L	0.0035525	1.36E-10	16.99692579	2.24E-07
Gout	TG	SLC30A3	9.00E-09	7.77E-16	44.88733252	1.86E-17
Gout	TG	SLC4A1AP	6.03E-07	5.00E-10	29.65869324	5.50E-12
Gout	TG	SLC5A6	1.59E-06	5.00E-10	28.46491648	1.49E-11
Gout	TG	SNX17	5.00E-10	5.00E-10	37.32476836	9.55E-15
Gout	TG	STAC3	2.11E-09	5.03E-06	25.9444416	1.21E-10
Gout	TG	STX1A	0.00095407	3.12E-08	16.79961998	2.65E-07
Gout	TG	SUPT7L	2.40E-06	4.10E-14	34.15198592	1.32E-13
Gout	TG	TBL2	1.95E-13	5.00E-10	44.34996742	2.89E-17
Gout	TG	TCF23	2.12E-05	6.87E-05	15.61033761	7.27E-07
Gout	TG	THBS3	5.00E-10	0.0057606	15.4353991	8.43E-07
Gout	TG	TRIB1	0.00030571	1.17E-14	26.14727885	1.03E-10
Gout	TG	TRIM54	4.04E-10	1.49E-14	46.68539402	4.22E-18
Gout	TG	UCN	2.00E-09	3.16E-15	45.88028424	8.20E-18
Gout	TG	ZDHC18	6.43E-06	2.44E-05	17.71916625	1.22E-07

Gout	TG	ZNF512	4.65E-15	5.00E-10	47.33807496	2.47E-18
Gout	TG	ZNF513	8.05E-15	5.00E-10	46.9110279	3.51E-18
Hypertension	T2D	ALDOA	0.00046558	2.87E-08	17.96575245	2.24E-06
Hypertension	T2D	ATP5G1	0.0021393	2.47E-14	21.52245615	2.10E-07
Hypertension	T2D	C16orf92	0.00025921	1.17E-09	20.73149186	3.56E-07
Hypertension	T2D	CENPW	0.0019128	3.61E-15	22.50305132	1.10E-07
Hypertension	T2D	CMIP	0.00011593	4.41E-10	22.5653861	1.05E-07
Hypertension	T2D	DOC2A	0.00017882	1.39E-09	21.2185358	2.57E-07
Hypertension	T2D	FAM57B	0.0003349	2.55E-09	19.87851429	6.27E-07
Hypertension	T2D	GIP	0.00091612	5.22E-15	24.10006756	3.82E-08
Hypertension	T2D	HIRIP3	0.00054437	1.77E-08	18.0062546	2.18E-06
Hypertension	T2D	IGF2BP1	0.0019789	2.94E-11	18.8651805	1.23E-06
Hypertension	T2D	IGF2BP2	0.00081467	2.03E-15	24.7416618	2.50E-08
Hypertension	T2D	INO80E	0.00026341	4.16E-09	19.97477873	5.88E-07
Hypertension	T2D	INSR	3.35E-05	3.38E-07	19.8069192	6.57E-07
Hypertension	T2D	MTNR1B	0.0069993	4.63E-14	18.30958803	1.78E-06
Hypertension	T2D	NOTCH4	0.00046899	2.21E-08	18.10907475	2.04E-06
Hypertension	T2D	PRRT1	0.0047925	1.36E-13	18.9293016	1.18E-06
Hypertension	T2D	SNF8	0.0034025	5.85E-14	20.08054524	5.48E-07
Hypertension	T2D	TAOK2	0.00036591	1.39E-08	18.76213248	1.32E-06
Hypertension	T2D	TMEM219	0.00029557	1.29E-08	19.127703	1.03E-06
Hypertension	T2D	UBE2Z	0.0036726	6.01E-14	19.88242128	6.25E-07
Hypertension	T2D	WFS1	0.0063258	1.28E-13	18.24146506	1.86E-06
Hypertension	T2D	YPEL3	0.0003993	4.84E-08	17.88147225	2.37E-06
Hypertension	TG	ARID1A	7.08E-05	3.83E-06	17.02560636	3.16E-07

Hypertension	TG	BRE	0.018233	1.64E-18	18.20092755	1.20E-07
Hypertension	TG	GPATCH3	0.00023907	1.10E-06	16.5379345	4.73E-07
Hypertension	TG	GPSM3	0.0014456	2.40E-07	14.9967894	1.69E-06
Hypertension	TG	INSR	3.35E-05	7.88E-07	19.14230297	5.54E-08
Hypertension	TG	KCNK3	5.00E-10	0.0016006	18.00867838	1.41E-07
Hypertension	TG	MIR1296	0.0034666	5.18E-10	16.47999	4.96E-07
Hypertension	TG	MRPL33	0.0076002	6.00E-15	18.73160436	7.76E-08
Hypertension	TG	NOTCH4	0.00046899	1.38E-10	20.88093605	1.33E-08
Hypertension	TG	NR0B2	9.17E-05	6.38E-06	16.325724	5.63E-07
Hypertension	TG	RBKS	0.0084371	5.00E-10	14.59780036	2.36E-06
Hypertension	TG	REEP3	0.00037271	1.13E-10	21.38914998	8.78E-09
T2D	TG	ABHD16A	0.00023819	5.79E-08	18.51626063	1.12E-06
T2D	TG	AGER	3.98E-07	5.60E-06	21.68368501	1.28E-07
T2D	TG	AGPAT1	2.00E-09	3.66E-06	26.3847528	5.20E-09
T2D	TG	APOC1	1.94E-15	5.83E-14	58.3147413	2.55E-18
T2D	TG	APOC1P1	1.79E-09	1.13E-14	45.06628034	1.79E-14
T2D	TG	APOE	2.02E-11	7.38E-15	50.7706927	3.94E-16
T2D	TG	APOM	4.46E-11	5.36E-06	28.54409682	1.20E-09
T2D	TG	ARL15	8.12E-14	0.0030114	20.2598319	3.38E-07
T2D	TG	ATF6B	2.44E-07	1.82E-05	20.77267628	2.38E-07
T2D	TG	ATP6V1G2	2.95E-12	4.32E-07	33.86170076	3.33E-11
T2D	TG	ATP6V1G2-DDX39B	4.10E-15	1.23E-06	36.58554755	5.32E-12
T2D	TG	BAG6	3.15E-12	3.37E-05	27.38799826	2.63E-09
T2D	TG	BAZ1B	0.002274	5.00E-10	17.33481156	2.53E-06
T2D	TG	BLK	1.27E-07	0.00013546	18.77354048	9.39E-07

T2D	TG	BPTF	1.28E-11	9.80E-05	24.84123664	1.48E-08
T2D	TG	BRE	0.00099909	1.64E-18	26.89198575	3.69E-09
T2D	TG	BTNL2	4.84E-09	0.00033628	19.50628815	5.67E-07
T2D	TG	C2	5.40E-07	2.27E-10	30.4019158	3.43E-10
T2D	TG	C2orf16	9.92E-08	1.69E-13	37.85423056	2.27E-12
T2D	TG	C6orf10	9.77E-13	1.08E-08	39.40548984	7.99E-13
T2D	TG	C6orf15	2.82E-05	3.99E-08	21.61680144	1.34E-07
T2D	TG	C6orf25	8.65E-06	2.77E-09	25.05224628	1.29E-08
T2D	TG	C6orf47	2.96E-08	1.37E-07	27.86922075	1.90E-09
T2D	TG	C6orf48	2.14E-06	4.20E-07	22.6439026	6.62E-08
T2D	TG	CAD	0.00045441	8.88E-15	25.43009007	9.94E-09
T2D	TG	CCDC121	2.09E-05	5.00E-10	25.0302118	1.30E-08
T2D	TG	CCDC92	7.39E-06	1.80E-08	23.8658544	2.88E-08
T2D	TG	CCHCR1	3.51E-15	2.10E-08	42.67523175	8.91E-14
T2D	TG	CDSN	2.87E-05	2.35E-09	23.56494133	3.53E-08
T2D	TG	CEP68	1.57E-13	0.00071179	23.24662444	4.39E-08
T2D	TG	CILP2	0.00024401	6.06E-12	23.63903136	3.36E-08
T2D	TG	CLIC1	6.61E-07	1.19E-10	30.63487465	2.93E-10
T2D	TG	CMIP	4.41E-10	0.00018422	21.83108398	1.15E-07
T2D	TG	COBLL1	4.45E-13	3.51E-07	35.45356794	1.14E-11
T2D	TG	CSNK2B	1.02E-08	3.61E-08	30.20565385	3.92E-10
T2D	TG	DDAH2	2.50E-07	9.52E-12	33.7438998	3.60E-11
T2D	TG	DEFB135	8.50E-07	3.39E-05	19.06877962	7.66E-07
T2D	TG	D/JC5G	4.82E-05	5.77E-15	30.1095837	4.18E-10
T2D	TG	EGFL8	6.11E-09	1.67E-06	26.48452797	4.86E-09

T2D	TG	EHMT2	1.00E-09	3.56E-13	43.04681038	6.94E-14
T2D	TG	EIF2B4	1.56E-10	5.00E-10	38.44217762	1.53E-12
T2D	TG	FADS1	3.46E-05	5.00E-10	24.31113542	2.13E-08
T2D	TG	FADS2	0.00016359	5.00E-10	21.94985232	1.06E-07
T2D	TG	FBRSL1	5.54E-09	0.00010772	21.14072268	1.85E-07
T2D	TG	FBXL22	6.40E-09	0.0005932	18.44301006	1.18E-06
T2D	TG	FEN1	3.07E-05	5.00E-10	24.48280956	1.89E-08
T2D	TG	FNDC4	3.97E-09	7.15E-12	38.97326806	1.07E-12
T2D	TG	FTH1P3	7.22E-09	1.33E-10	35.80942032	8.96E-12
T2D	TG	FTO	7.09E-15	0.0037852	20.54946582	2.77E-07
T2D	TG	FZD9	0.00010291	3.05E-12	25.5279045	9.30E-09
T2D	TG	GATA4	5.78E-05	1.99E-06	17.78102913	1.86E-06
T2D	TG	GATAD2A	2.01E-06	2.99E-14	34.61961222	2.00E-11
T2D	TG	GCK	4.17E-12	5.63E-07	33.26363341	4.98E-11
T2D	TG	GCKR	8.96E-14	5.00E-10	44.9865669	1.89E-14
T2D	TG	GIPR	9.94E-15	0.00021203	26.96812444	3.50E-09
T2D	TG	GPANK1	4.59E-09	3.28E-09	33.33192118	4.75E-11
T2D	TG	GPN1	0.0014729	5.00E-10	18.16507902	1.43E-06
T2D	TG	GPSM3	5.18E-09	2.40E-07	28.8176364	1.00E-09
T2D	TG	GTF3C2	5.00E-10	5.00E-10	37.32476836	3.23E-12
T2D	TG	HAPLN4	0.00041862	3.75E-11	21.74570406	1.22E-07
T2D	TG	HCG27	4.86E-07	3.35E-10	30.22881888	3.86E-10
T2D	TG	HCP5	6.23E-10	3.52E-07	30.12985426	4.12E-10
T2D	TG	HERC1	1.46E-09	0.00060253	19.21801589	6.92E-07
T2D	TG	HLA-B	3.62E-12	2.74E-09	39.9660107	5.49E-13

T2D	TG	HLA-C	7.14E-10	1.21E-09	36.11105652	7.32E-12
T2D	TG	HLA-DQA1	1.45E-11	4.08E-13	47.61128496	3.26E-15
T2D	TG	HLA-DQB1	3.08E-14	2.91E-10	46.492236	6.90E-15
T2D	TG	HLA-DRA	1.47E-12	0.000508	22.93960688	5.41E-08
T2D	TG	HLA-DRB6	1.64E-11	4.20E-10	40.7097895	3.33E-13
T2D	TG	IFT172	2.70E-09	5.00E-10	35.64407242	1.00E-11
T2D	TG	INSR	3.38E-07	7.88E-07	23.8528584	2.91E-08
T2D	TG	JMJD1C	0.00047889	5.05E-09	18.92026514	8.49E-07
T2D	TG	KIAA0754	2.22E-16	0.00025201	28.26675574	1.45E-09
T2D	TG	KRTCAP3	1.11E-08	5.00E-10	34.17109608	2.70E-11
T2D	TG	LPAR2	0.00093231	4.77E-15	24.0950061	2.46E-08
T2D	TG	LPL	1.96E-09	5.00E-10	35.97153626	8.04E-12
T2D	TG	LRRC8E	3.64E-08	0.00013653	19.59633432	5.33E-07
T2D	TG	LSM2	0.00014291	5.90E-07	17.62784298	2.07E-06
T2D	TG	LST1	1.79E-10	0.00031512	21.43581747	1.51E-07
T2D	TG	LTA	1.29E-11	7.12E-07	32.15235744	1.05E-10
T2D	TG	LTB	4.62E-10	1.38E-07	31.457897	1.68E-10
T2D	TG	LY6G5B	2.31E-08	2.12E-08	29.95422228	4.64E-10
T2D	TG	LY6G5C	3.31E-09	4.39E-09	33.36854112	4.64E-11
T2D	TG	LY6G6C	1.80E-05	7.90E-08	21.6646003	1.29E-07
T2D	TG	LY6G6D	0.00036005	1.25E-09	20.15823344	3.63E-07
T2D	TG	LY6G6E	0.00061	4.34E-10	19.83243782	4.53E-07
T2D	TG	LY6G6F	0.0010543	2.61E-09	17.95477255	1.65E-06
T2D	TG	MACF1	2.60E-14	1.83E-05	31.07480665	2.18E-10
T2D	TG	MAP2K7	1.34E-07	0.00022758	18.0338352	1.56E-06

T2D	TG	MAP3K11	1.93E-08	0.00054184	17.9630966	1.64E-06
T2D	TG	MAPKBP1	4.43E-09	0.00076397	18.2266443	1.37E-06
T2D	TG	MAU2	1.83E-08	8.88E-16	43.809714	4.16E-14
T2D	TG	MCCD1	3.50E-11	4.20E-06	29.04731682	8.57E-10
T2D	TG	MICB	1.34E-12	0.00028892	24.06885158	2.51E-08
T2D	TG	MIR1236	2.14E-05	1.35E-11	27.2600856	2.87E-09
T2D	TG	MIR1908	5.43E-05	1.56E-13	28.21202928	1.51E-09
T2D	TG	MIR611	3.92E-05	4.11E-15	30.6608258	2.88E-10
T2D	TG	MIR642A	1.01E-13	0.00059371	23.81953606	2.97E-08
T2D	TG	MLXIPL	0.0021769	5.00E-10	17.41973222	2.39E-06
T2D	TG	MPV17	7.93E-07	5.44E-15	37.0983457	3.77E-12
T2D	TG	MRPL33	0.002547	6.00E-15	21.6127961	1.34E-07
T2D	TG	MSH5	1.06E-07	5.86E-12	35.19806532	1.35E-11
T2D	TG	MSL2	2.13E-06	2.73E-05	18.553737	1.09E-06
T2D	TG	MSRA	5.47E-14	0.003174	20.27549972	3.35E-07
T2D	TG	MUC22	0.00016461	3.50E-08	19.36159568	6.27E-07
T2D	TG	NCR3	4.53E-11	2.53E-07	32.5650656	7.97E-11
T2D	TG	NEU1	6.28E-07	3.83E-08	26.0489682	6.53E-09
T2D	TG	NFKBIL1	2.61E-15	3.95E-07	38.62022055	1.35E-12
T2D	TG	NOTCH4	2.21E-08	1.38E-10	34.54490055	2.10E-11
T2D	TG	NRBF2	0.00018998	1.36E-07	18.27367728	1.32E-06
T2D	TG	NRBP1	1.00E-08	6.53E-12	37.98054677	2.08E-12
T2D	TG	PABPC4	1.89E-15	1.69E-05	32.59353632	7.82E-11
T2D	TG	PBX2	1.73E-07	2.24E-06	23.38126392	4.01E-08
T2D	TG	PBX4	0.00020406	1.05E-12	24.83974656	1.48E-08

T2D	TG	PCCB	1.14E-06	7.94E-06	20.39922444	3.07E-07
T2D	TG	PINX1	3.17E-08	3.42E-09	31.3440732	1.82E-10
T2D	TG	POU5F1	3.02E-14	2.23E-06	34.44903936	2.24E-11
T2D	TG	PPARG	1.22E-15	0.0014296	23.6124525	3.42E-08
T2D	TG	PPIEL	5.00E-10	0.00015289	22.05737776	9.88E-08
T2D	TG	PPM1G	1.45E-09	5.00E-10	36.27089686	6.57E-12
T2D	TG	PPT2	6.74E-12	2.37E-07	34.06336045	2.90E-11
T2D	TG	PRRC2A	7.25E-13	8.95E-05	26.52505448	4.73E-09
T2D	TG	PRRT1	1.36E-13	2.71E-07	36.61784064	5.20E-12
T2D	TG	PRSS36	0.00022054	2.85E-07	17.57556846	2.15E-06
T2D	TG	PSORS1C1	2.81E-10	8.62E-12	41.71717484	1.69E-13
T2D	TG	PSORS1C2	9.80E-13	1.71E-09	41.58833181	1.85E-13
T2D	TG	PSORS1C3	1.25E-08	1.31E-06	26.18731918	5.95E-09
T2D	TG	PVRL2	3.04E-10	5.04E-14	46.03971434	9.35E-15
T2D	TG	QPCTL	4.53E-13	0.00013907	25.96808909	6.90E-09
T2D	TG	REEP3	1.61E-06	1.13E-10	29.52924282	6.19E-10
T2D	TG	RNF5	2.81E-07	7.06E-06	21.72469665	1.24E-07
T2D	TG	RPAP1	3.27E-11	0.001213	19.80399792	4.62E-07
T2D	TG	SAPCD1	3.79E-06	2.15E-10	27.94714276	1.80E-09
T2D	TG	SIDT2	0.002104	5.00E-10	17.48571374	2.28E-06
T2D	TG	SKIV2L	5.18E-05	1.36E-10	24.51007338	1.86E-08
T2D	TG	SLC22A3	8.04E-09	7.02E-07	27.25584771	2.88E-09
T2D	TG	SLC2A2	3.74E-11	2.61E-05	26.34074356	5.36E-09
T2D	TG	SLC30A3	0.00028857	7.77E-16	27.44248646	2.54E-09
T2D	TG	SLC44A4	5.00E-09	4.57E-12	39.07936251	9.95E-13

T2D	TG	SLC5A6	0.00043626	5.00E-10	20.33635978	3.21E-07
T2D	TG	SNORA38	1.64E-12	0.00025957	24.17481378	2.33E-08
T2D	TG	SNORA55	7.12E-14	3.32E-06	33.3107094	4.82E-11
T2D	TG	SNORA70F	7.57E-13	2.30E-10	44.08159704	3.47E-14
T2D	TG	SNORD117	2.78E-12	7.21E-06	29.88598722	4.86E-10
T2D	TG	SNORD48	6.01E-06	3.48E-07	21.72322671	1.24E-07
T2D	TG	SNORD52	7.30E-07	1.55E-07	24.64750552	1.69E-08
T2D	TG	SNRPD2	1.16E-11	0.00018843	23.770523	3.07E-08
T2D	TG	SNX17	5.85E-10	5.00E-10	37.17081148	3.59E-12
T2D	TG	SOX7	1.12E-07	0.00010713	19.16651464	7.16E-07
T2D	TG	STAG1	1.18E-05	7.43E-06	18.30891068	1.29E-06
T2D	TG	SUGP1	1.72E-07	5.00E-10	31.14633214	2.07E-10
T2D	TG	TAGLN	0.0052104	2.20E-14	19.3352266	6.38E-07
T2D	TG	TCF19	7.25E-16	6.60E-07	38.60187192	1.37E-12
T2D	TG	TIMP4	3.71E-14	0.0020292	21.49539008	1.45E-07
T2D	TG	TM6SF2	7.77E-06	1.20E-14	32.9575633	6.12E-11
T2D	TG	TNF	1.85E-11	3.60E-08	35.63360628	1.01E-11
T2D	TG	TOMM40	2.04E-12	5.00E-10	42.3656343	1.10E-13
T2D	TG	TRIM54	1.16E-05	1.49E-14	32.15990086	1.05E-10
T2D	TG	TSSK6	0.000586	2.98E-08	17.59050288	2.12E-06
T2D	TG	UCN	3.78E-06	3.16E-15	34.90884412	1.64E-11
T2D	TG	VEGFA	0.00024014	3.03E-09	20.30342165	3.28E-07
T2D	TG	VWA7	8.29E-06	3.15E-10	26.62641582	4.41E-09
T2D	TG	XKR6	1.58E-13	6.03E-05	28.02078174	1.72E-09
T2D	TG	ZBTB12	2.60E-09	1.49E-12	40.76107716	3.22E-13

T2D	TG	ZC3H4	2.80E-08	2.50E-05	22.02867212	1.01E-07
T2D	TG	ZNF512	4.82E-08	5.00E-10	32.58509584	7.86E-11
T2D	TG	ZNF513	1.15E-09	5.00E-10	36.50244312	5.62E-12
T2D	TG	ZNF664	1.24E-06	1.32E-09	28.04054016	1.69E-09

AAD: Acute aortic dissection; PLACO: pleiotropic analysis under composite null hypothesis; TAA: thoracic aortic aneurysm; TG: triglyceride;

T2D: type 2 diabetes.

Supplementary Table 3. MAGMA analysis results of significant pleiotropic genes identified between trait pairs

Trait	Gene	Chromosome	Start	Stop	NSNPS	NPARA M	N	ZSTAT.cal	P
Obesity	ANKDD1B	5	74897300	74977671	104	13	80797	4.623241201	3.78E-06
Obesity	ARID1A	1	27012521	27118601	19	3	92126	0.337632696	0.73564
Obesity	BDNF	11	27666441	27753605	48	6	93344	7.15967484	8.09E-13
Obesity	BPTF	17	65811779	65990494	46	3	92216	3.397261059	0.0006806 4
Obesity	BRE	2	28103481	28571767	302	24	93057	2.279944169	0.022611
Obesity	C2orf16	2	27789388	27815589	14	2	97551	1.850579994	0.06423
Obesity	CCDC121	2	27838505	27861898	27	3	97976	1.941587973	0.052187
Obesity	D/JC5G	2	27488288	27514296	3	1	97028	1.149305575	0.25043
Obesity	EIF2B4	2	27577218	27603324	7	1	91565	1.797590027	0.072242
Obesity	FNDC4	2	27704749	27728126	8	2	89831	1.501021503	0.13335
Obesity	FTH1P3	2	27605489	27626443	5	2	86445	0	0.1481
Obesity	FTO	16	53727874	54158379	499	70	90860	5.887357187	3.92E-09
Obesity	FZD9	7	72838108	72860450	3	1	94185	0	0.99559
Obesity	GCKR	2	27709705	27756550	23	4	91788	1.812040104	0.06998
Obesity	GIPR	19	46161501	46195717	7	2	83277	4.790881715	1.66E-06
Obesity	GPATCH3	1	27206978	27236962	8	3	91956	0.590523105	0.55484
Obesity	GPN1	2	27841514	27883713	27	3	95804	1.819140484	0.06889
Obesity	GTF3C2	2	27538715	27589901	13	2	94178	1.723312658	0.084832
Obesity	HIST1H2A B	6	26023319	26043796	14	4	94821	0.824052021	0.40991

Obesity	HIST1H3B	6	26021816	26042288	16	4	94594	0.749991208	0.45326
Obesity	HIST1H4B	6	26017123	26037480	19	4	93060	0.343702541	0.73107
Obesity	IFT172	2	27657239	27722678	21	2	93583	1.62080251	0.10506
Obesity	INSR	19	7102265	7304011	149	36	84404	0.023940587	0.9809
Obesity	KCNK3	2	26905580	26964066	29	4	97054	3.624063815	0.0002900 1
Obesity	KRTCAP3	2	27655232	27679348	6	1	98682	1.770944087	0.07657
Obesity	MAP3K11	11	65355225	65391720	14	3	88899	3.028476737	0.0024579
Obesity	MIR642A	19	46168185	46188282	5	2	84173	0	1.40E-06
Obesity	MLXIPL	7	72997523	73048870	15	4	83808	0.21788335	0.82752
Obesity	MPV17	2	27522359	27555969	6	2	91784	1.212607291	0.22528
Obesity	MRPL33	2	27984583	28012608	7	2	97356	2.010152982	0.044415
Obesity	NOTCH4	6	32152619	32201844	115	22	87025	1.703337108	0.088505
Obesity	NR0B2	1	27227974	27250567	10	3	90392	0.907580312	0.3641
Obesity	NRBP1	2	27641472	27675124	10	1	98483	1.72370562	0.084761
Obesity	OVOL1	11	65544504	65574690	16	4	97032	1.115397781	0.26468
Obesity	PCNXL3	11	65373782	65414910	12	2	92683	2.233196334	0.025536
Obesity	POC5	5	74960023	75023313	69	8	90699	5.273933925	1.34E-07
Obesity	PPM1G	2	27594065	27642550	13	2	91694	1.57015094	0.11638
Obesity	REEP3	10	65271122	65394883	93	9	88219	2.587041259	0.0096804
Obesity	RELA	11	65411066	65440443	11	3	85864	1.734051195	0.082909
Obesity	SLC30A3	2	27467439	27495960	12	1	94650	1.308540639	0.19069
Obesity	SNORA70F	2	165534152	16555428 7	11	3	85984	0	0.0041961
Obesity	SNRPD2	19	46180711	46205443	8	3	82111	4.90239961	9.47E-07

Obesity	SNX17	2	27583362	27610400	9	2	86066	1.618615584	0.10553
Obesity	TFAP2B	6	50776438	50825326	33	6	93024	5.434783515	5.49E-08
Obesity	TRIM54	2	27495296	27540307	8	1	92908	1.141119975	0.25382
Obesity	UCN	2	27520264	27541130	3	1	86320	0	0.37514
Obesity	ZNF512	2	27795835	27856082	43	3	97087	1.911051212	0.055998
Obesity	ZNF513	2	27590097	27613611	8	1	90667	1.579418922	0.11424
AAD	ANKDD1B	5	74897300	74977671	335	41	221279	3.499100836	0.0004668 3
AAD	ARID1A	1	27012521	27118601	282	29	221279	-0.538749085	0.59006
AAD	BDNF	11	27666441	27753605	247	47	221279	1.341895133	0.17963
AAD	BPTF	17	65811779	65990494	558	40	221279	1.029680526	0.30316
AAD	BRE	2	28103481	28571767	1687	88	221279	-0.448142995	0.65405
AAD	C2orf16	2	27789388	27815589	59	17	221279	0.867770468	0.38552
AAD	CCDC121	2	27838505	27861898	89	18	221279	-1.013461032	0.31084
AAD	D/JC5G	2	27488288	27514296	74	24	221279	-1.585600336	0.11283
AAD	EIF2B4	2	27577218	27603324	74	32	221279	0.433020331	0.665
AAD	FNDC4	2	27704749	27728126	68	19	221279	0.648363302	0.51675
AAD	FTH1P3	2	27605489	27626443	69	23	221279	0	0.26474
AAD	FTO	16	53727874	54158379	1984	201	221279	-0.355373231	0.72231
AAD	FZD9	7	72838108	72860450	60	27	221279	1.023312744	0.30616
AAD	GCKR	2	27709705	27756550	147	31	221279	0.779967509	0.43541
AAD	GIPR	19	46161501	46195717	180	33	221279	-1.673087865	0.09431
AAD	GPATCH3	1	27206978	27236962	69	21	221279	0.355640246	0.72211
AAD	GPN1	2	27841514	27883713	148	26	221279	0.875963273	0.38105
AAD	GTF3C2	2	27538715	27589901	106	41	221279	0.874694782	0.38174

AAD	HIST1H2A B	6	26023319	26043796	93	32	221279	0.004085815	0.99674
AAD	HIST1H3B	6	26021816	26042288	98	32	221279	-0.002907693	0.99768
AAD	HIST1H4B	6	26017123	26037480	106	34	221279	-0.025959051	0.97929
AAD	IFT172	2	27657239	27722678	175	31	221279	0.988699883	0.32281
AAD	INSR	19	7102265	7304011	1345	146	221279	-1.474749138	0.14028
AAD	KCNK3	2	26905580	26964066	202	41	221279	-2.393752456	0.016677
AAD	KRTCAP3	2	27655232	27679348	63	19	221279	0.506878603	0.61224
AAD	MAP3K11	11	65355225	65391720	123	37	221279	-0.193011451	0.84695
AAD	MIR642A	19	46168185	46188282	86	30	221279	0	0.046234
AAD	MLXIPL	7	72997523	73048870	200	35	221279	-0.114337824	0.90897
AAD	MPV17	2	27522359	27555969	69	33	221279	1.519367571	0.12867
AAD	MRPL33	2	27984583	28012608	76	31	221279	-1.21051849	0.22608
AAD	NOTCH4	6	32152619	32201844	356	51	221279	0.34638952	0.72905
AAD	NR0B2	1	27227974	27250567	77	21	221279	-0.25978451	0.79503
AAD	NRBP1	2	27641472	27675124	91	19	221279	0.585532084	0.55819
AAD	OVOL1	11	65544504	65574690	120	28	221279	-0.651660825	0.51462
AAD	PCNXL3	11	65373782	65414910	122	42	221279	0.598884362	0.54925
AAD	POC5	5	74960023	75023313	354	31	221279	2.877224547	0.0040119
AAD	PPM1G	2	27594065	27642550	138	33	221279	1.112298101	0.26601
AAD	REEP3	10	65271122	65394883	457	45	221279	0.762603327	0.4457
AAD	RELA	11	65411066	65440443	88	29	221279	-0.551574371	0.58124
AAD	SLC30A3	2	27467439	27495960	116	29	221279	1.403962556	0.16033
AAD	SNORA70F	2	165534152	16555428 7	64	26	221279	0	0.58138

AAD	SNRPD2	19	46180711	46205443	87	28	221279	0.971036707	0.33153
AAD	SNX17	2	27583362	27610400	80	32	221279	0.426202906	0.66996
AAD	TFAP2B	6	50776438	50825326	203	46	221279	0.387913564	0.69808
AAD	TRIM54	2	27495296	27540307	114	37	221279	-1.406890031	0.15946
AAD	UCN	2	27520264	27541130	50	26	221279	1.461858461	0.14378
AAD	ZNF512	2	27795835	27856082	177	29	221279	-0.812752455	0.41636
AAD	ZNF513	2	27590097	27613611	78	27	221279	0.28084407	0.77883
TAA	ANKDD1B	5	74897300	74977671	390	52	19646	1.33242674	0.18272
TAA	ARID1A	1	27012521	27118601	333	51	19646	0.374530055	0.70801
TAA	BDNF	11	27666441	27753605	300	52	19646	0.267960141	0.78873
TAA	BPTF	17	65811779	65990494	739	47	19646	0.561319134	0.57458
TAA	BRE	2	28103481	28571767	2081	114	19646	-0.515075875	0.6065
TAA	C2orf16	2	27789388	27815589	119	29	19646	0.175686808	0.86054
TAA	CCDC121	2	27838505	27861898	114	27	19646	0.551034536	0.58161
TAA	D/JC5G	2	27488288	27514296	86	32	19646	-1.447524785	0.14775
TAA	EIF2B4	2	27577218	27603324	98	44	19646	-1.43390281	0.1516
TAA	FNDC4	2	27704749	27728126	88	27	19646	-1.481099729	0.13858
TAA	FTH1P3	2	27605489	27626443	91	33	19646	0	0.11246
TAA	FTO	16	53727874	54158379	2337	228	19646	0.54616867	0.58495
TAA	FZD9	7	72838108	72860450	80	40	19646	-0.231083414	0.81725
TAA	GCKR	2	27709705	27756550	198	45	19646	-1.251533224	0.21074
TAA	GIPR	19	46161501	46195717	183	41	19646	0.417613124	0.67623
TAA	GPATCH3	1	27206978	27236962	90	30	19646	0.351131096	0.72549
TAA	GPN1	2	27841514	27883713	180	36	19646	0.219616295	0.82617
TAA	GTF3C2	2	27538715	27589901	158	49	19646	-1.126485677	0.25996

TAA	HIST1H2A B	6	26023319	26043796	135	52	19646	0.505838541	0.61297
TAA	HIST1H3B	6	26021816	26042288	146	54	19646	0.501783245	0.61582
TAA	HIST1H4B	6	26017123	26037480	150	54	19646	-0.451082625	0.65193
TAA	IFT172	2	27657239	27722678	221	43	19646	-1.631428193	0.1028
TAA	INSR	19	7102265	7304011	1467	170	19646	-1.040581114	0.29807
TAA	KCNK3	2	26905580	26964066	248	58	19646	-1.193969242	0.23249
TAA	KRTCAP3	2	27655232	27679348	76	25	19646	-1.431873596	0.15218
TAA	MAP3K11	11	65355225	65391720	151	47	19646	1.043903584	0.29653
TAA	MIR642A	19	46168185	46188282	94	35	19646	0	0.38293
TAA	MLXIPL	7	72997523	73048870	240	49	19646	-1.35999976	0.17383
TAA	MPV17	2	27522359	27555969	98	39	19646	-0.58638027	0.55762
TAA	MRPL33	2	27984583	28012608	99	42	19646	-0.261586828	0.79364
TAA	NOTCH4	6	32152619	32201844	370	60	19646	-0.640727106	0.5217
TAA	NR0B2	1	27227974	27250567	73	20	19646	0.426312707	0.66988
TAA	NRBP1	2	27641472	27675124	116	27	19646	-1.573383696	0.11563
TAA	OVOL1	11	65544504	65574690	142	38	19646	-1.186993968	0.23523
TAA	PCNXL3	11	65373782	65414910	153	55	19646	1.160095319	0.24601
TAA	POC5	5	74960023	75023313	375	45	19646	0.428152632	0.66854
TAA	PPM1G	2	27594065	27642550	181	48	19646	-1.660668715	0.09678
TAA	REEP3	10	65271122	65394883	553	49	19646	1.520720468	0.12833
TAA	RELA	11	65411066	65440443	113	42	19646	1.235081967	0.2168
TAA	SLC30A3	2	27467439	27495960	134	35	19646	-1.818033583	0.069059
TAA	SNORA70F	2	165534152	16555428 7	98	34	19646	0	0.89765

TAA	SNRPD2	19	46180711	46205443	91	32	19646	0.309080884	0.75726
TAA	SNX17	2	27583362	27610400	105	45	19646	-1.601844499	0.10919
TAA	TFAP2B	6	50776438	50825326	232	58	19646	-0.486235788	0.6268
TAA	TRIM54	2	27495296	27540307	148	51	19646	-1.012644492	0.31123
TAA	UCN	2	27520264	27541130	68	33	19646	0.480418278	0.63093
TAA	ZNF512	2	27795835	27856082	293	34	19646	0.312908736	0.75435
TAA	ZNF513	2	27590097	27613611	96	39	19646	-1.480424484	0.13876
Gout	ANKDD1B	5	74897300	74977671	478	65	587890	-1.321814286	0.18623
Gout	ARID1A	1	27012521	27118601	433	57	523424	-3.895577575	9.80E-05
Gout	BDNF	11	27666441	27753605	374	70	540933	-2.464642541	0.013715
Gout	BPTF	17	65811779	65990494	979	53	514030	-3.247093697	0.0011659
Gout	BRE	2	28103481	28571767	2504	137	576743	-5.25816493	1.46E-07
Gout	C2orf16	2	27789388	27815589	137	36	531478	-7.778698051	7.27E-15
Gout	CCDC121	2	27838505	27861898	126	31	601489	-7.606326366	2.83E-14
Gout	D/JC5G	2	27488288	27514296	111	41	535896	6.219104561	5.00E-10
Gout	EIF2B4	2	27577218	27603324	126	53	487806	7.73656283	1.03E-14
Gout	FND4	2	27704749	27728126	112	38	561657	-6.219104561	5.00E-10
Gout	FTH1P3	2	27605489	27626443	123	40	542881	0	5.00E-10
Gout	FTO	16	53727874	54158379	2684	263	601168	-1.933927845	0.053122
Gout	FZD9	7	72838108	72860450	101	48	544029	4.882366881	1.05E-06
Gout	GCKR	2	27709705	27756550	251	62	562538	6.219104561	5.00E-10
Gout	GIPR	19	46161501	46195717	231	47	572195	-0.211432242	0.83255
Gout	GPATCH3	1	27206978	27236962	127	48	472564	-4.285901037	1.82E-05
Gout	GPN1	2	27841514	27883713	211	43	588769	6.500786853	7.99E-11
Gout	GTF3C2	2	27538715	27589901	208	66	472592	8.076571004	7.22E-16

Gout	HIST1H2A B	6	26023319	26043796	155	63	560908	7.99157395	1.28E-15
Gout	HIST1H3B	6	26021816	26042288	163	63	575418	7.916520712	2.55E-15
Gout	HIST1H4B	6	26017123	26037480	168	64	574566	10	1.11E-16
Gout	IFT172	2	27657239	27722678	296	52	540009	6.847611301	7.51E-12
Gout	INSR	19	7102265	7304011	1795	190	562996	-5.193695711	2.06E-07
Gout	KCNK3	2	26905580	26964066	313	64	550264	1.470560548	0.14141
Gout	KRTCAP3	2	27655232	27679348	105	37	512217	8.076571004	7.22E-16
Gout	MAP3K11	11	65355225	65391720	182	60	554229	4.86442504	1.15E-06
Gout	MIR642A	19	46168185	46188282	111	41	598357	0	0.70673
Gout	MLXIPL	7	72997523	73048870	295	45	569849	-7.446092627	9.62E-14
Gout	MPV17	2	27522359	27555969	133	54	486333	6.711299262	1.93E-11
Gout	MRPL33	2	27984583	28012608	127	51	528427	-6.572540315	4.95E-11
Gout	NOTCH4	6	32152619	32201844	424	63	631100	-2.386837521	0.016994
Gout	NR0B2	1	27227974	27250567	98	30	539721	-4.305910884	1.66E-05
Gout	NRBP1	2	27641472	27675124	162	42	518244	7.409024754	1.27E-13
Gout	OVOL1	11	65544504	65574690	159	42	587591	-7.145239293	8.98E-13
Gout	PCNXL3	11	65373782	65414910	181	68	546825	6.597138503	4.19E-11
Gout	POC5	5	74960023	75023313	495	43	545233	2.107999878	0.035031
Gout	PPM1G	2	27594065	27642550	251	60	522033	6.219104561	5.00E-10
Gout	REEP3	10	65271122	65394883	632	57	612030	3.272608406	0.0010656
Gout	RELA	11	65411066	65440443	131	51	553832	-7.373059913	1.67E-13
Gout	SLC30A3	2	27467439	27495960	163	45	533317	5.748572599	9.00E-09
Gout	SNORA70F	2	165534152	16555428 7	108	39	595378	0	0.089582

Gout	SNRPD2	19	46180711	46205443	112	42	562393	-0.679864913	0.49659
Gout	SNX17	2	27583362	27610400	134	58	502335	-6.219104561	5.00E-10
Gout	TFAP2B	6	50776438	50825326	275	56	574877	3.264726034	0.0010957
Gout	TRIM54	2	27495296	27540307	192	63	513902	6.252427999	4.04E-10
Gout	UCN	2	27520264	27541130	88	41	507374	5.99780702	2.00E-09
Gout	ZNF512	2	27795835	27856082	337	47	553577	-7.835684964	4.65E-15
Gout	ZNF513	2	27590097	27613611	123	49	527802	-7.767681015	8.05E-15
Hypertension	ANKDD1B	5	74897300	74977671	324	34	56637	0.713591201	0.47548
Hypertension	ARID1A	1	27012521	27118601	194	18	56637	3.973426589	7.08E-05
Hypertension	BDNF	11	27666441	27753605	263	38	56637	0.938242114	0.34812
Hypertension	BPTF	17	65811779	65990494	542	27	56637	-0.528128718	0.59741
Hypertension	BRE	2	28103481	28571767	1553	74	56637	-2.360852113	0.018233
Hypertension	C2orf16	2	27789388	27815589	63	17	56637	1.047129186	0.29504
Hypertension	CCDC121	2	27838505	27861898	79	14	56637	1.553934673	0.1202
Hypertension	D/JC5G	2	27488288	27514296	73	22	56637	-1.753023345	0.079598
Hypertension	EIF2B4	2	27577218	27603324	62	19	56637	-0.545572256	0.58536

Hypertension	FNDC4	2	27704749	27728126	74	21	56637	-0.368943284	0.71217
Hypertension	FTH1P3	2	27605489	27626443	72	19	56637	0	0.60293
Hypertension	FTO	16	53727874	54158379	2070	197	56637	1.962493987	0.049705
Hypertension	FZD9	7	72838108	72860450	54	19	56637	-1.655934915	0.097735
Hypertension	GCKR	2	27709705	27756550	155	29	56637	0.377099046	0.7061
Hypertension	GIPR	19	46161501	46195717	180	31	56637	2.164004553	0.030464
Hypertension	GPATCH3	1	27206978	27236962	61	15	56637	3.673692945	0.00023907
Hypertension	GPN1	2	27841514	27883713	133	21	56637	1.145625842	0.25195
Hypertension	GTF3C2	2	27538715	27589901	100	31	56637	-0.723667321	0.46927
Hypertension	HIST1H2AB	6	26023319	26043796	110	38	56637	2.518099453	0.011799
Hypertension	HIST1H3B	6	26021816	26042288	117	38	56637	2.201891126	0.027673
Hypertension	HIST1H4B	6	26017123	26037480	116	37	56637	2.062838235	0.039128
Hypertension	IFT172	2	27657239	27722678	189	30	56637	-0.259499329	0.79525

Hypertension	INSR	19	7102265	7304011	1299	136	56637	-4.148473214	3.35E-05
Hypertension	KCNK3	2	26905580	26964066	187	35	56637	-6.219104561	5.00E-10
Hypertension	KRTCAP3	2	27655232	27679348	60	15	56637	-0.199489316	0.84188
Hypertension	MAP3K11	11	65355225	65391720	105	26	56637	-1.909768708	0.056163
Hypertension	MIR642A	19	46168185	46188282	84	27	56637	0	0.17791
Hypertension	MLXIPL	7	72997523	73048870	174	24	56637	-1.276694851	0.20171
Hypertension	MPV17	2	27522359	27555969	65	23	56637	-1.723976974	0.084712
Hypertension	MRPL33	2	27984583	28012608	68	24	56637	2.669333254	0.0076002
Hypertension	NOTCH4	6	32152619	32201844	345	52	56637	3.497869815	0.00046899
Hypertension	NR0B2	1	27227974	27250567	55	11	56637	3.911683439	9.17E-05
Hypertension	NRBP1	2	27641472	27675124	100	19	56637	-0.099753532	0.92054
Hypertension	OVOL1	11	65544504	65574690	107	22	56637	-2.432838046	0.014981
Hypertension	PCNXL3	11	65373782	65414910	98	30	56637	2.806782597	0.0050039

Hypertension	POC5	5	74960023	75023313	323	24	56637	-0.50340437	0.61468
Hypertension	PPM1G	2	27594065	27642550	144	27	56637	-0.430598957	0.66676
Hypertension	REEP3	10	65271122	65394883	472	43	56637	3.558689383	0.00037271
Hypertension	RELA	11	65411066	65440443	69	20	56637	2.302908355	0.021284
Hypertension	SLC30A3	2	27467439	27495960	104	22	56637	-0.635120236	0.52535
Hypertension	SNORA70F	2	165534152	165554287	77	23	56637	0	0.5145
Hypertension	SNRPD2	19	46180711	46205443	79	24	56637	-2.611473404	0.0090153
Hypertension	SNX17	2	27583362	27610400	68	22	56637	-0.298488961	0.76533
Hypertension	TFAP2B	6	50776438	50825326	195	40	56637	-1.931137909	0.053466
Hypertension	TRIM54	2	27495296	27540307	105	25	56637	-2.002769826	0.045202
Hypertension	UCN	2	27520264	27541130	44	15	56637	1.969514841	0.048894
Hypertension	ZNF512	2	27795835	27856082	169	24	56637	1.369541729	0.17083
Hypertension	ZNF513	2	27590097	27613611	68	20	56637	-0.293421492	0.7692

T2D	ANKDD1B	5	74897300	74977671	259	28	933970	-6.394275767	1.61E-10
T2D	ARID1A	1	27012521	27118601	175	16	933970	-3.113519968	0.0018487
T2D	BDNF	11	27666441	27753605	184	29	933970	-4.50959338	6.50E-06
T2D	BPTF	17	65811779	65990494	397	26	933970	-6.771356836	1.28E-11
T2D	BRE	2	28103481	28571767	1315	69	933970	3.290782861	0.0009990 9
T2D	C2orf16	2	27789388	27815589	52	12	933970	5.328267533	9.92E-08
T2D	CCDC121	2	27838505	27861898	66	10	933970	4.254806367	2.09E-05
T2D	D/JC5G	2	27488288	27514296	50	14	933970	-4.064405713	4.82E-05
T2D	EIF2B4	2	27577218	27603324	41	13	933970	-6.39895887	1.56E-10
T2D	FNDC4	2	27704749	27728126	54	12	933970	5.885488495	3.97E-09
T2D	FTH1P3	2	27605489	27626443	48	14	933970	0	7.22E-09
T2D	FTO	16	53727874	54158379	1684	161	933970	-7.782590618	7.09E-15
T2D	FZD9	7	72838108	72860450	33	11	933970	-3.883626387	0.0001029 1
T2D	GCKR	2	27709705	27756550	127	21	933970	-7.455237601	8.96E-14
T2D	GIPR	19	46161501	46195717	119	19	933970	7.739357991	9.94E-15
T2D	GPATCH3	1	27206978	27236962	48	10	933970	-2.9067628	0.0036519
T2D	GPN1	2	27841514	27883713	107	15	933970	-3.17997059	0.0014729
T2D	GTF3C2	2	27538715	27589901	61	18	933970	-6.219104561	5.00E-10
T2D	HIST1H2A B	6	26023319	26043796	90	29	933970	-2.852352114	0.0043397
T2D	HIST1H3B	6	26021816	26042288	97	30	933970	-2.907946992	0.0036381
T2D	HIST1H4B	6	26017123	26037480	97	29	933970	2.633422999	0.0084529
T2D	IFT172	2	27657239	27722678	127	17	933970	-5.948803299	2.70E-09

T2D	INSR	19	7102265	7304011	1103	118	933970	-5.100744511	3.38E-07
T2D	KCNK3	2	26905580	26964066	157	28	933970	-1.704294939	0.088326
T2D	KRTCAP3	2	27655232	27679348	40	8	933970	-5.712299044	1.11E-08
T2D	MAP3K11	11	65355225	65391720	89	20	933970	-5.618009394	1.93E-08
T2D	MIR642A	19	46168185	46188282	58	17	933970	0	1.01E-13
T2D	MLXIPL	7	72997523	73048870	152	21	933970	3.064972517	0.0021769
T2D	MPV17	2	27522359	27555969	39	12	933970	-4.937202917	7.93E-07
T2D	MRPL33	2	27984583	28012608	44	14	933970	-3.017701083	0.002547
T2D	NOTCH4	6	32152619	32201844	312	45	933970	5.594993527	2.21E-08
T2D	NR0B2	1	27227974	27250567	42	7	933970	-2.816367982	0.004857
T2D	NRBP1	2	27641472	27675124	71	11	933970	-5.730389982	1.00E-08
T2D	OVOL1	11	65544504	65574690	83	16	933970	-3.862788623	0.0001121
T2D	PCNXL3	11	65373782	65414910	84	22	933970	-5.118552216	3.08E-07
T2D	POC5	5	74960023	75023313	244	26	933970	7.030562794	2.06E-12
T2D	PPM1G	2	27594065	27642550	93	19	933970	-6.049562182	1.45E-09
T2D	REEP3	10	65271122	65394883	387	31	933970	4.796576915	1.61E-06
T2D	RELA	11	65411066	65440443	63	17	933970	4.5340074	5.79E-06
T2D	SLC30A3	2	27467439	27495960	74	13	933970	-3.62535032	0.0002885 7
T2D	SNORA70F	2	165534152	16555428 7	58	15	933970	0	7.57E-13
T2D	SNRPD2	19	46180711	46205443	62	17	933970	-6.78573005	1.16E-11
T2D	SNX17	2	27583362	27610400	46	13	933970	6.194360865	5.85E-10
T2D	TFAP2B	6	50776438	50825326	135	25	933970	-6.240630705	4.36E-10
T2D	TRIM54	2	27495296	27540307	75	17	933970	-4.38527376	1.16E-05

T2D	UCN	2	27520264	27541130	30	10	933970	-4.622994366	3.78E-06
T2D	ZNF512	2	27795835	27856082	147	20	933970	5.457995449	4.82E-08
T2D	ZNF513	2	27590097	27613611	49	14	933970	6.086841333	1.15E-09
TG	ANKDD1B	5	74897300	74977671	152	19	127483	0.468104306	0.63971
TG	ARID1A	1	27012521	27118601	18	3	105361	4.620221815	3.83E-06
TG	BDNF	11	27666441	27753605	97	15	120006	2.880917035	0.0039652
TG	BPTF	17	65811779	65990494	43	2	92538	3.895436601	9.80E-05
TG	BRE	2	28103481	28571767	522	38	119918	10	1.64E-18
TG	C2orf16	2	27789388	27815589	26	5	124464	7.371472246	1.69E-13
TG	CCDC121	2	27838505	27861898	38	5	144257	6.219104561	5.00E-10
TG	D/JC5G	2	27488288	27514296	16	4	86635	7.808807497	5.77E-15
TG	EIF2B4	2	27577218	27603324	24	6	101045	6.219104561	5.00E-10
TG	FNDC4	2	27704749	27728126	19	3	116475	6.854534724	7.15E-12
TG	FTH1P3	2	27605489	27626443	10	3	102905	0	1.33E-10
TG	FTO	16	53727874	54158379	874	88	121780	2.895529044	0.0037852
TG	FZD9	7	72838108	72860450	12	5	104571	0	3.05E-12
TG	GCKR	2	27709705	27756550	46	8	121823	6.219104561	5.00E-10
TG	GIPR	19	46161501	46195717	31	8	95747	3.704234558	0.0002120 3
TG	GPATCH3	1	27206978	27236962	6	2	105460	4.873731146	1.10E-06
TG	GPN1	2	27841514	27883713	47	7	130815	6.219104561	5.00E-10
TG	GTF3C2	2	27538715	27589901	28	6	115532	6.219104561	5.00E-10
TG	HIST1H2A B	6	26023319	26043796	32	8	112345	0.524731293	0.59977
TG	HIST1H3B	6	26021816	26042288	36	9	114349	0.761815715	0.44617

TG	HIST1H4B	6	26017123	26037480	41	10	119304	0.880054105	0.37883
TG	IFT172	2	27657239	27722678	45	5	114799	6.219104561	5.00E-10
TG	INSR	19	7102265	7304011	123	31	99323	4.938246903	7.88E-07
TG	KCNK3	2	26905580	26964066	26	4	112976	3.155797396	0.0016006
TG	KRTCAP3	2	27655232	27679348	15	3	106707	6.219104561	5.00E-10
TG	MAP3K11	11	65355225	65391720	8	3	123514	3.45917139	0.0005418 4
TG	MIR642A	19	46168185	46188282	9	4	114904	0	0.0005937 1
TG	MLXIPL	7	72997523	73048870	69	11	102442	6.219104561	5.00E-10
TG	MPV17	2	27522359	27555969	18	6	111277	7.81374999	5.44E-15
TG	MRPL33	2	27984583	28012608	17	5	110070	7.804048692	6.00E-15
TG	NOTCH4	6	32152619	32201844	106	22	124731	6.417665408	1.38E-10
TG	NR0B2	1	27227974	27250567	7	2	103385	4.513232379	6.38E-06
TG	NRBP1	2	27641472	27675124	19	3	117834	6.867670119	6.53E-12
TG	OVOL1	11	65544504	65574690	15	4	119391	2.781196168	0.0054159
TG	PCNXL3	11	65373782	65414910	9	2	129539	3.044470873	0.0023309
TG	POC5	5	74960023	75023313	132	13	119083	0.495566915	0.6202
TG	PPM1G	2	27594065	27642550	29	5	104207	6.219104561	5.00E-10
TG	REEP3	10	65271122	65394883	79	9	96413	6.448543557	1.13E-10
TG	RELA	11	65411066	65440443	6	2	104691	3.194857289	0.001399
TG	SLC30A3	2	27467439	27495960	38	7	106447	8.041399959	7.77E-16
TG	SNORA70F	2	165534152	16555428 7	23	6	118691	0	2.30E-10

TG	SNRPD2	19	46180711	46205443	23	8	99978	3.734043403	0.0001884 3
TG	SNX17	2	27583362	27610400	26	7	100174	6.219104561	5.00E-10
TG	TFAP2B	6	50776438	50825326	80	12	116019	0.229847851	0.81821
TG	TRIM54	2	27495296	27540307	26	6	108389	7.688586102	1.49E-14
TG	UCN	2	27520264	27541130	12	5	109009	0	3.16E-15
TG	ZNF512	2	27795835	27856082	70	7	133353	6.219104561	5.00E-10
TG	ZNF513	2	27590097	27613611	21	5	97772	6.219104561	5.00E-10

AAD: Acute aortic dissection; TAA: thoracic aortic aneurysm; TG: triglyceride; T2D: type 2 diabetes.

Supplementary Table 4. Detailed information on identified pleiotropic genes

ensg	entre zID	symbol	hgnc_ symbol	O MI M	unip rotI D	DrugBank
ENSG00000117713	8289	ARID1A	ARID1A	603024	O14497	/
ENSG00000198746	63906	GPATCH3	GPATCH3	/	Q96I76	/
ENSG00000131910	8431	NR0B2	NR0B2	604630	Q15466	/
ENSG00000171303	3777	KCNK3	KCNK3	603220	O14649	DB00561:DB01159
ENSG00000115194	7781	SLC30A3	SLC30A3	602878	Q99726	/
ENSG00000163793	285126	D/JC5G	D/JC5G	613946	Q8N7S2	/
ENSG00000138100	57159	TRIM54	TRIM54	606474	Q9BYV2	/
ENSG00000163794	7349	UCN	UCN	600945	P55089	/
ENSG00000115204	4358	MPV17	MPV17	137960	P39210	/
ENSG00000115207	2976	GTF3C2	GTF3C2	604883	Q8WUA4	/

ENSG000 00115211	8890	EIF2B 4	EIF2B 4	606 687	Q9U I10	/
ENSG000 00115234	9784	SNX1 7	SNX1 7	605 963	Q15 036	/
ENSG000 00163795	1305 57	ZNF5 13	ZNF5 13	613 598	Q8N 8E2	/
ENSG000 00115241	5496	PPM1 G	PPM1 G	605 119	O15 355	/
ENSG000 00213453	/	FTH1 P3	FTH1 P3	/	/	/
ENSG000 00115216	2995 9	NRBP 1	NRBP 1	606 010	Q9U HY1	/
ENSG000 00157992	2006 34	KRTC AP3	KRTC AP3	/	Q53 RY4	/
ENSG000 00138002	2616 0	IFT17 2	IFT17 2	607 386	Q9U G01	/
ENSG000 00115226	6483 8	FNDC 4	FNDC 4	611 905	Q9H 6D8	/
ENSG000 00084734	2646	GCK R	GCKR	600 842	Q14 397	/
ENSG000 00221843	8422 6	C2orf 16	C2orf1 6	/	Q68 DN1	/
ENSG000 00243943	8445 0	ZNF5 12	ZNF5 12	/	Q96 ME7	/
ENSG000 00176714	7963 5	CCDC 121	CCDC 121	/	Q6Z US5	/

ENSG000 00198522	1132 1	GPN1	GPN1	611 479	Q9H CN4	/
ENSG000 00243147	9553	MRPL 33	MRPL 33	610 059	O75 394	/
ENSG000 00158019	9577	BRE	BRE	610 497	Q9N XR7	/
ENSG000 00206869	1003 3759 1	SNOR A70F	SNOR A70F	/	/	/
ENSG000 00189045	7287 80	ANK DD1B	ANK DD1B	/	A6N HY2	/
ENSG000 00152359	1343 59	POC5	POC5	/	Q8/7 2	/
ENSG000 00124529	5543 13	HIST1 H4B	HIST1 H4B	615 069	P628 05	/
ENSG000 00124693	8968	HIST1 H3B	HIST1 H3B	602 819	P684 31	/
ENSG000 00137259	8335	HIST1 H2AB	HIST1 H2AB	602 795	P049 08	/
ENSG000 00204301	4855	NOTC H4	NOTC H4	164 951	Q99 466	/
ENSG000 00008196	7021	TFAP 2B	TFAP 2B	601 601	Q92 481	/
ENSG000 00188763	8326	FZD9	FZD9	601 766	O00 144	/

ENSG000 00009950	5108 5	MLXI PL	MLXI PL	605 678	Q9N P71	/
ENSG000 00165476	2210 35	REEP 3	REEP 3	609 348	Q6N UK4	/
ENSG000 00176697	627	BDNF	BDNF	113 505	P235 60	DB05047:DB09130:DB09301:DB11823
ENSG000 00173327	4296	MAP3 K11	MAP3 K11	600 050	Q16 584	DB12010
ENSG000 00197136	3999 09	PCNX L3	PCNX L3	/	Q9H 6A9	/
ENSG000 00173039	5970	RELA	RELA	164 014	Q04 206	DB08908
ENSG000 00172818	5017	OVO L1	OVOL 1	602 313	O14 753	/
ENSG000 00140718	7906 8	FTO	FTO	610 966	Q9C 0B1	DB11638
ENSG000 00171634	2186	BPTF	BPTF	601 819	Q12 830	/
ENSG000 00171105	3643	INSR	INSR	147 670	P062 13	DB00030:DB00046:DB00047:DB00071:DB01277:DB01306:DB01307:DB01309:DB03909:DB05115:DB05120:DB08513:DB09129:DB09564:DB12010:DB12267:DB14751
ENSG000 00010310	2696	GIPR	GIPR	137 241	P485 46	/

ENSG000 00207773	1005 0084 5	MIR6 42A	MIR6 42A	/	/	/
ENSG000 00125743	6633	SNRP D2	SNRP D2	601 061	P623 16	DB11638

Supplementary Table 5. The identification of pleiotropic SNPs among paired metabolic diseases via the PLACO method

Trait 1	Trait 2	SNP	Chromosome	Position	A 1	A 2	P.x	P.y	T.placo	P.placo	N
Obesity	AAD	rs258494	5	75038718	G	C	2.00E-07	9.06E-05	- 21.077330 57	6.83E- 11	158830
Obesity	AAD	rs4776990	15	68137364	C	T	1.30E-09	0.0103944	- 15.694815 27	1.20E- 08	159000.2
Obesity	AAD	rs4787456	16	28559573	T	C	5.80E-07	0.0001016 51	18.835169 1	5.92E- 10	159976.8
Obesity	AAD	rs7203521	16	53769293	A	G	1.20E-15	0.0825886	- 14.688076 36	3.15E- 08	159491.7 5
Obesity	Gout	rs1093839 7	4	45182527	G	A	5.00E-16	0.03407	17.899408 28	1.16E- 08	431013.4
Obesity	Gout	rs1182814	6	25859554	C	T	0.0079	2.33E-16	21.362162 16	4.81E- 10	430503.5
Obesity	Gout	rs1207226	11	64402027	T	C	0.0023	1.27E-13	- 22.600849 95	1.54E- 10	415760.5
Obesity	Gout	rs1263819 5	3	52876639	G	A	0.001	1.02E-06	16.503088 15	4.19E- 08	408988.2
Obesity	Gout	rs2030323	11	27728539	C	A	2.50E-12	0.003175	21.677148 85	3.60E- 10	430373.9 5

Obesity	Gout	rs2207139	6	50845490	G	A	1.30E-14	0.0019	25.192307 69	1.41E- 11	429340.9
Obesity	Gout	rs258494	5	75038718	G	C	2.00E-07	0.0008738	17.975113 12	1.09E- 08	408970
Obesity	Gout	rs4665969	2	27574953	C	T	0.054	1.14E-17	- 16.404428 9	4.59E- 08	431136.5 5
Obesity	Gout	rs4693209	4	89187068	C	G	1.00E-04	1.05E-14	- 29.068764 57	3.92E- 13	410052.6
Obesity	Gout	rs512898	1	17788842 9	C	T	1.60E-09	0.0002163	22.728804 04	1.37E- 10	430997.8 5
Obesity	Gout	rs571312	18	57839769	A	C	6.60E-18	1.37E-07	45.659955 26	8.61E- 20	429636
Obesity	Gout	rs6021954	20	51129093	T	C	3.40E-07	0.001031	16.887537 99	2.95E- 08	429915.1 5
Obesity	Gout	rs7141420	14	79899454	T	C	2.30E-10	0.009489	17.045219 64	2.55E- 08	431248.6 5
Obesity	Gout	rs7698826	4	10497423	A	C	0.03	4.22E-18	19.545801 53	2.56E- 09	410100.6
Obesity	Gout	rs887912	2	59302877	T	C	2.30E-09	0.00531	16.334004 02	4.89E- 08	430649.9
Obesity	Hypertensi on	rs1222074 3	10	10485191 2	T	C	3.50E-05	4.59E-07	- 21.041398 29	3.96E- 10	71940.5

Obesity	Hypertensi on	rs1275923	2	26932796	C	T	0.012	6.24E-14	19.029586 83	2.59E- 09	77226.55
Obesity	Hypertensi on	rs1299937 3	2	663483	G	A	3.40E-08	0.0014412	17.324809 07	1.27E- 08	76766.35
Obesity	Hypertensi on	rs1457489	18	57861961	A	G	1.50E-16	0.0332154	18.250266 58	5.36E- 09	76026.65
Obesity	Hypertensi on	rs1849338	4	45142805	G	A	1.80E-10	0.0098216 8	16.997142 92	1.72E- 08	77637.95
Obesity	Hypertensi on	rs2172935	1	20182634 0	T	C	2.20E-05	0.0002311 35	15.858263 93	4.97E- 08	77044.5
Obesity	Hypertensi on	rs2920919	8	76712697	G	A	2.00E-07	1.26E-05	23.507198 63	3.94E- 11	76836.5
Obesity	Hypertensi on	rs630372	1	17788576 2	A	G	1.60E-12	0.0111882	18.599350 55	3.87E- 09	76880.85
Obesity	Hypertensi on	rs7023913	9	13101796 2	G	A	7.30E-07	0.0004456 3	17.460153 23	1.12E- 08	76823.5
Obesity	Hypertensi on	rs887912	2	59302877	T	C	2.30E-09	0.0036862 3	17.005170 38	1.71E- 08	77030.9
Obesity	T2D	rs1096857 6	9	28414339	G	A	3.90E-07	5.43E-08	28.461538 46	7.15E- 11	514931.5
Obesity	T2D	rs1104202 5	11	8675475	A	C	5.80E-08	7.65E-07	26.559356 14	3.12E- 10	515662.8 5
Obesity	T2D	rs1167166 4	19	46172278	G	A	0.00029	7.61E-10	- 22.039525 69	1.04E- 08	506699.5

Obesity	T2D	rs12194148	6	32444198	G	T	0.0035	4.41E-14	- 21.4556213	1.65E-08	516102.55
Obesity	T2D	rs12446632	16	19935389	G	A	7.70E-08	2.59E-05	23.41696535	3.58E-09	514054
Obesity	T2D	rs12599391	16	69605349	T	C	0.00083	5.30E-11	22.93846154	5.19E-09	516328.45
Obesity	T2D	rs13039375	20	51157432	G	A	1.90E-06	7.16E-06	21.82142857	1.24E-08	514571.5
Obesity	T2D	rs13130484	4	45175691	T	C	3.40E-16	8.49E-11	54.93685419	1.01E-19	516197.65
Obesity	T2D	rs13422522	2	227011320	G	C	0.00026	5.51E-19	- 33.03291139	2.08E-12	515455.8
Obesity	T2D	rs1519480	11	27675712	C	T	5.10E-10	2.58E-06	29.68325792	2.78E-11	515909.5
Obesity	T2D	rs16945088	16	53812524	A	G	3.00E-06	2.82E-06	21.68067227	1.38E-08	509235.65
Obesity	T2D	rs17146964	11	65249145	G	A	0.0021	3.79E-11	20.16768293	4.49E-08	514964.95
Obesity	T2D	rs17522122	14	33302882	T	G	2.10E-05	2.49E-08	24.38942308	1.68E-09	513811.15
Obesity	T2D	rs17685538	10	114797471	G	C	0.012	4.15E-19	- 22.28971963	8.60E-09	508957.9

Obesity	T2D	rs1778231 3	18	57851097	C	T	3.70E-18	2.21E-13	63.902222 22	1.05E- 22	514706.1
Obesity	T2D	rs2010390	8	9047178	A	G	7.00E-04	1.38E-09	20.382653 06	3.79E- 08	516310
Obesity	T2D	rs2307111	5	75003678	T	C	3.30E-08	1.05E-14	40.991715 98	4.51E- 15	516229
Obesity	T2D	rs2815749	1	72814783	G	A	1.50E-06	2.14E-07	25.520331 33	6.99E- 10	515113.9
Obesity	T2D	rs2820446	1	21974881 8	G	C	0.019	2.83E-17	- 20.852747 25	2.63E- 08	515519.1
Obesity	T2D	rs3776705	5	53304955	T	C	0.00038	9.62E-13	- 26.098825 83	4.46E- 10	515678.0 5
Obesity	T2D	rs4132228	3	64708114	T	C	0.01	3.34E-14	- 20.476706 39	3.53E- 08	515714.5
Obesity	T2D	rs4776970	15	68080886	A	T	2.80E-10	1.69E-08	35.152698 05	4.06E- 13	516324.4
Obesity	T2D	rs6485455	11	43753725	G	C	0.0011	2.49E-12	23.741360 09	2.78E- 09	515477.3 5
Obesity	T2D	rs6857	19	45392254	C	T	0.0042	1.50E-14	22.619339 05	6.65E- 09	510826.4 5
Obesity	T2D	rs693232	1	17788165 1	G	C	1.30E-12	9.67E-12	46.578125	6.15E- 17	515269.9

Obesity	T2D	rs7138803	12	50247468	A	G	2.60E-11	2.16E-07	33.482517 48	1.47E- 12	516311.5
Obesity	T2D	rs7156625	14	79942647	A	G	1.20E-06	8.66E-13	35.014718 61	4.51E- 13	515555.1 5
Obesity	T2D	rs7189927	16	28913787	T	C	3.40E-07	9.95E-08	28.281285 88	8.22E- 11	516094.8
Obesity	T2D	rs7203521	16	53769293	A	G	1.20E-15	1.29E-10	54.358974 36	1.57E- 19	515837.2 5
Obesity	T2D	rs759250	2	59329153	A	G	2.30E-09	6.52E-07	29.202040 82	4.03E- 11	515692
Obesity	T2D	rs7607980	2	16555120 1	C	T	0.0019	2.56E-18	- 27.211068 91	1.88E- 10	513624
Obesity	T2D	rs7647305	3	18583429 0	C	T	1.10E-11	7.89E-05	26.160337 55	4.25E- 10	515548.5
Obesity	T2D	rs7850520	9	12650980 6	G	A	3.20E-06	5.81E-06	22.015384 62	1.06E- 08	515881.8
Obesity	T2D	rs7970350	12	66360164	C	T	0.00035	4.17E-17	-30.765625	1.20E- 11	516310.6
Obesity	T2D	rs8086914	18	40075856	A	G	1.20E-06	5.32E-06	22.060849 6	1.03E- 08	515614.8 5
Obesity	T2D	rs939584	2	621558	T	C	2.00E-19	1.52E-08	49.411764 71	6.98E- 18	515288.3
Obesity	T2D	rs987237	6	50803050	G	A	1.00E-16	3.20E-13	58.955792 68	4.62E- 21	514539.5

Obesity	TG	rs1046276	16	30914626	T	C	0.00054	6.78E-06	16.338461 54	4.47E-08	93774.2
Obesity	TG	rs1076174 1	10	65066186	G	T	0.0048	1.40E-14	21.360294 12	4.36E-10	138012.3 5
Obesity	TG	rs1105740 8	12	12446483 6	T	G	0.004	2.05E-12	- 20.980219 78	6.19E-10	135947.9
Obesity	TG	rs1240658	11	11649636 0	T	C	0.017	3.01E-12	- 17.418764 3	1.65E-08	135373.4 9
Obesity	TG	rs1313048 4	4	45175691	T	C	3.40E-16	0.00156	25.135746 61	1.32E-11	138120.1
Obesity	TG	rs132985	22	38563471	T	C	0.0022	6.65E-11	- 20.919191 92	6.55E-10	136582
Obesity	TG	rs1340426 3	2	22702039 9	A	G	7.00E-04	8.88E-07	- 17.297101 45	1.85E-08	136354.6 15
Obesity	TG	rs1460940	1	72814617	A	G	7.90E-07	0.0001188	18.504787 96	6.08E-09	137039.8 85
Obesity	TG	rs1702439 3	1	11015468 8	C	T	1.70E-06	0.001525	16.913096 7	2.64E-08	114970.6 15
Obesity	TG	rs174449	11	61640379	G	A	0.04	2.46E-17	17.771428 57	1.20E-08	131304.5

Obesity	TG	rs2075650	19	45395619	A	G	0.0064	2.31E-21	- 24.024489 8	3.71E- 11	126776.5 6
Obesity	TG	rs2168708	18	57907311	T	G	3.30E-16	6.20E-06	39.460916 44	2.25E- 17	92505.75
Obesity	TG	rs2301784	19	19390749	G	A	0.0096	1.37E-17	23.769230 77	4.70E- 11	135922.9 5
Obesity	TG	rs3775214	4	88023299	A	G	0.002	3.93E-17	26.818181 82	2.79E- 12	138137.5
Obesity	TG	rs419788	6	31928799	T	C	0.0035	8.85E-19	- 27.359667 36	1.69E- 12	135755
Obesity	TG	rs4784323	16	53797565	G	A	5.20E-19	0.004874	26.25	4.72E- 12	134076.3 5
Obesity	TG	rs492400	2	21934975 2	C	T	2.00E-05	2.25E-06	- 22.574074 07	1.42E- 10	131474.6 5
Obesity	TG	rs550136	1	10865640 3	G	T	0.00019	9.70E-07	17.25	1.93E- 08	93303.4
Obesity	TG	rs641990	6	16077913 4	A	G	0.0059	4.84E-09	- 17.429292 93	1.64E- 08	137405.9
Obesity	TG	rs6545714	2	59307725	G	A	1.20E-07	0.0001355	21.651583 71	3.33E- 10	138258
Obesity	TG	rs7010610	8	19632090	G	T	0.04	1.56E-18	17.5	1.54E- 08	137799

Obesity	TG	rs7103411	11	27700125	T	C	2.80E-12	0.00168	25.483333 33	9.60E- 12	137445.4 9
Obesity	TG	rs7138803	12	50247468	A	G	2.60E-11	0.003131	19.574660 63	2.27E- 09	138211
Obesity	TG	rs7141420	14	79899454	T	C	2.30E-10	0.0116	17.755050 51	1.21E- 08	138178.6 5
Obesity	TG	rs7200543	16	15129970	A	G	0.0054	2.66E-07	- 16.590436 59	3.55E- 08	135795.5 05
Obesity	TG	rs731839	19	33899065	A	G	0.013	2.65E-09	- 16.273504 27	4.75E- 08	136669.0 5
Obesity	TG	rs7588926	2	27342894	T	C	0.0014	1.39E-15	- 24.946428 57	1.58E- 11	133527.8 8
Obesity	TG	rs7607980	2	16555120 1	C	T	0.0019	2.41E-12	- 22.482105 26	1.54E- 10	135508.9 7
Obesity	TG	rs7735253	5	53297611	G	A	0.00032	1.50E-06	- 17.447368 42	1.61E- 08	137608.0 35
Obesity	TG	rs8036171	15	95266810	A	C	7.30E-06	0.0003921	16.764705 88	3.02E- 08	136423
Obesity	TG	rs9816226	3	18583449 9	T	A	1.00E-11	0.001158	22.96875	9.85E- 11	136962.8

Obesity	TG	rs998584	6	43757896	C	A	0.00035	3.42E-15	- 27.452252 25	1.55E-12	135536.4
AAD	TAA	rs1332128 2	3	41959452	T	C	3.76E-05	1.83E-05	17.658090 95	3.30E-09	120462.5
AAD	TAA	rs591519	15	48894200	T	A	1.32E-11	1.06E-09	41.276151 2	1.01E-19	120462.5
AAD	Gout	rs1424065 96	2	22150945	T	G	2.77E-07	0.001328	16.497628 22	3.49E-08	435692.5
AAD	Gout	rs5601131 2	4	89166627	T	C	0.0024182 4	3.73E-17	- 25.508871 81	5.80E-12	471419
AAD	Gout	rs6229428 8	4	9931173	T	C	4.51E-05	1.54E-08	23.062687 79	6.11E-11	492495
AAD	Hypertensi on	rs1275923	2	26932796	T	C	0.0003389 14	6.24E-14	26.864232 48	9.53E-13	138958
AAD	T2D	rs1160285 8	11	72615069	G	C	0.0213747	1.90E-18	- 20.108911 04	1.57E-08	577624.5
AAD	T2D	rs1472772 83	10	11476461 9	T	G	0.0204056	1.15E-17	19.862952 12	1.93E-08	577624.5
AAD	T2D	rs1768553 8	10	11479747 1	G	C	0.0236788	4.15E-19	- 20.170448 85	1.49E-08	577624.5

AAD	T2D	rs2307111	5	75003678	C	T	0.0001137 78	1.05E-14	- 29.804571 48	5.12E- 12	577624.5
AAD	T2D	rs2947794	12	66206598	T	C	0.0025199 4	1.40E-18	- 26.642086 48	6.99E- 11	577624.5
AAD	T2D	rs3560832 7	15	90369204	T	C	0.0215963	5.35E-19	20.514717 33	1.12E- 08	577624.5
AAD	T2D	rs438811	19	45416741	T	C	0.0037846 9	4.91E-13	21.058648 18	7.14E- 09	577624.5
AAD	T2D	rs890220	8	41478361	A	G	0.0274524	1.21E-17	18.886475 58	4.33E- 08	577624.5
AAD	TG	rs1145212	11	11655686 5	A	G	0.0002898 61	4.06E-13	28.140775 36	1.45E- 12	199519.5
AAD	TG	rs1166764 0	19	45379791	T	C	0.0052045 1	1.10E-15	- 22.183451 8	3.59E- 10	196056.1 8
AAD	TG	rs1469513	2	21259562	C	T	0.0004103 36	2.24E-15	- 30.241292 82	2.08E- 13	197985
AAD	TG	rs2395655	6	36645696	G	A	0.0003034 66	2.03E-06	- 18.887262 84	7.70E- 09	199435
AAD	TG	rs2727270	11	61603237	T	C	0.0088358 8	2.10E-14	21.629785 01	6.01E- 10	156146

AAD	TG	rs3810444	19	19103986	A	T	0.031062	1.57E-16	- 18.044617 88	1.69E- 08	193541.3 2
AAD	TG	rs592423	6	13984069 3	C	A	0.0265589	1.85E-13	17.541961 36	2.70E- 08	199486.5
AAD	TG	rs6015233 1	1	63177539	T	G	0.0014524 5	3.84E-10	21.359561 91	7.72E- 10	154006.5
AAD	TG	rs7837390	8	19626120	T	C	0.0282267	2.28E-13	16.972064 46	4.59E- 08	199464
AAD	TG	rs8180991	8	12650035 0	G	C	0.0288689	6.82E-14	- 17.318179 79	3.32E- 08	199477.5 2
TAA	Gout	rs1173422 0	4	9634271	C	A	0.0041911 02	7.60E-12	19.525124 24	1.10E- 09	370602.5
TAA	Gout	rs1701328 5	4	88767008	A	G	0.0169183 34	7.96E-17	19.941011 69	7.31E- 10	370602.5
TAA	Gout	rs3923	6	25783315	C	T	0.0403739 42	5.92E-17	- 17.203412 9	1.08E- 08	391754
TAA	Gout	rs4930312	11	65499719	A	G	0.0500951 24	3.56E-18	17.062157	1.24E- 08	391757
TAA	Gout	rs5449514 35	4	88975969	T	G	0.0316303 54	2.25E-16	- 17.630615 34	7.06E- 09	358921.5
TAA	T2D	rs1088539 7	10	11471188 3	A	G	0.0022636 77	6.49E-16	24.694519 57	2.57E- 10	476808

TAA	T2D	rs1118714 5	10	94478104	T	C	0.0069055 65	1.32E-15	- 21.580217 39	3.52E- 09	476808
TAA	T2D	rs1222113 3	10	12253597	A	G	0.0129555 53	5.79E-19	- 22.194693 98	2.10E- 09	476808
TAA	T2D	rs1767630 9	3	64730121	C	T	0.0047399 75	5.62E-13	- 20.334193 84	1.00E- 08	476808
TAA	T2D	rs1783598	11	72851463	T	C	0.0017363 92	4.49E-16	25.326402 03	1.51E- 10	476808
TAA	T2D	rs1907609 12	10	11468544 0	C	A	0.0126370 69	6.27E-15	- 19.429059 63	2.15E- 08	476808
TAA	T2D	rs2086802	3	17065662 0	C	T	0.0164876 13	5.55E-17	- 20.149348 19	1.17E- 08	476808
TAA	T2D	rs3132535	6	31116526	G	A	0.0040290 83	5.74E-13	20.756320 25	7.03E- 09	476808
TAA	T2D	rs3526569 8	6	32561334	G	C	0.0192214 77	5.81E-19	20.836747 47	6.57E- 09	476808
TAA	T2D	rs3533853 9	9	4298589	A	G	0.0063576 18	1.75E-12	- 19.261717 03	2.48E- 08	476808

TAA	T2D	rs878521	7	44255643	A	G	0.0014771 93	9.31E-17	- 26.550006 87	5.41E- 11	476808
TAA	TG	rs2353082	7	72913168	C	G	0.0075294 07	2.42E-11	17.498345 61	2.61E- 08	85400.5
TAA	TG	rs2442719	6	31320538	T	C	0.0071681 77	7.58E-10	- 18.299652 17	1.24E- 08	88474
TAA	TG	rs2727270	11	61603237	T	C	0.0159706 9	2.10E-14	19.905264 68	2.80E- 09	55329.5
TAA	TG	rs283	8	19815098	T	C	0.0260918 36	1.70E-16	18.708899 98	8.48E- 09	94756.02
TAA	TG	rs634869	6	13983175 7	C	T	0.0170349 66	1.78E-14	19.666030 12	3.49E- 09	98700.5
TAA	TG	rs6547521	2	27488432	C	G	0.0142396 43	1.13E-17	21.824756 23	4.72E- 10	55329.5
TAA	TG	rs7897379	10	65301725	C	T	0.0142527 99	1.27E-17	20.349300 21	1.85E- 09	98727.5
Gout	Hypertensi on	rs1025373 6	7	15141525 6	T	C	1.84E-08	7.06E-06	25.224384 92	1.45E- 11	410129.5
Gout	Hypertensi on	rs1104871	6	26665235	T	G	2.75E-08	0.0004083 23	19.680493 11	2.75E- 09	410224
Gout	Hypertensi on	rs1141653 49	1	27021913	C	G	7.90E-16	3.13E-06	37.474315 62	1.42E- 16	410149
Gout	Hypertensi on	rs1729947 8	16	69775500	T	C	5.23E-10	0.0050446 3	17.452013 35	2.28E- 08	410256

Gout	Hypertension	rs2270114	17	59478776	C	G	8.93E-07	6.69E-07	24.33231985	3.37E-11	389098
Gout	Hypertension	rs3809114	12	57848639	A	G	2.15E-11	0.00905962	17.46405021	2.25E-08	410256
Gout	Hypertension	rs4235343	4	10728594	A	C	2.71E-08	0.000853486	18.54353152	8.09E-09	389098
Gout	Hypertension	rs62310614	4	89085242	A	G	4.85E-11	0.000625336	- 22.48113655	1.94E-10	389098
Gout	Hypertension	rs78412025	11	65495696	T	C	4.20E-18	0.00285592	25.89751312	7.67E-12	410226
Gout	T2D	rs10406327	19	33890838	C	G	0.001947	2.44E-09	18.50545058	4.53E-08	848756.5
Gout	T2D	rs10422508	19	46115484	T	G	0.001405	1.21E-09	19.36933242	2.18E-08	848870
Gout	T2D	rs10882040	10	94011799	A	C	0.001872	1.87E-17	26.35298295	5.95E-11	827764.5
Gout	T2D	rs113045419	12	4406576	T	C	0.00321	2.66E-12	20.62633088	7.50E-09	824893.5
Gout	T2D	rs113788679	19	7242120	T	C	3.27E-08	1.15E-07	29.21869919	5.33E-12	827764.5
Gout	T2D	rs113954968	2	27696207	A	C	5.78E-19	2.88E-08	- 49.29292929	2.65E-19	827764.5
Gout	T2D	rs11727676	4	145659064	T	C	2.27E-05	1.03E-06	20.649259	7.36E-09	846051.5

Gout	T2D	rs1200143 7	9	34074476	T	C	0.001001	1.10E-09	20.108957 22	1.16E- 08	827764.5
Gout	T2D	rs1323437 8	7	73026151	A	T	1.10E-15	0.0001052	- 31.001561 89	1.19E- 12	848850.5
Gout	T2D	rs1408268	6	25826986	A	T	2.27E-16	0.004729	23.335463 84	7.59E- 10	848841.5
Gout	T2D	rs1413700	6	7216484	C	G	3.22E-07	1.08E-08	29.304194 26	4.96E- 12	848834.5
Gout	T2D	rs1454412 83	4	99751794	A	G	3.10E-06	1.68E-05	- 20.082721 99	1.19E- 08	816331
Gout	T2D	rs1473184	10	11489529 5	T	C	0.003436	1.00E-14	22.630454 05	1.38E- 09	848829.5
Gout	T2D	rs1515114	2	22709838 7	A	G	0.00151	6.52E-16	25.636230 47	1.09E- 10	848922.5
Gout	T2D	rs1859805 90	4	88916431	A	G	1.89E-12	0.0007777	23.691642 3	5.62E- 10	826129
Gout	T2D	rs2080090	17	65828371	A	T	0.001325	3.39E-10	20.053004 54	1.22E- 08	827764.5
Gout	T2D	rs2120825	3	12413339	T	G	0.0166	5.79E-16	19.310031 26	2.29E- 08	848922.5
Gout	T2D	rs2303700	19	7976529	T	C	0.006604	1.39E-12	19.229166 67	2.45E- 08	826325
Gout	T2D	rs2583951	12	66182254	A	G	0.02258	3.62E-19	20.314902 17	9.77E- 09	848898

Gout	T2D	rs2708081	12	12146328 8	T	C	0.0008905	1.24E-09	20.176757 81	1.10E-08	848922.5
Gout	T2D	rs2854004	6	31313972	A	G	0.0004627	1.71E-09	21.008955 22	5.43E-09	824893.5
Gout	T2D	rs3533853 9	9	4298589	A	G	0.008217	1.75E-12	18.573216 52	4.28E-08	827764.5
Gout	T2D	rs393223	4	10360591 6	A	G	8.52E-05	1.91E-07	20.414508 34	8.98E-09	848760
Gout	T2D	rs3936510	5	55860866	T	G	0.007556	4.03E-17	22.428192 7	1.63E-09	848805
Gout	T2D	rs39999	16	69653696	C	G	1.69E-10	3.47E-06	29.693662 42	3.57E-12	848899
Gout	T2D	rs423144	1	15516935 5	T	G	1.02E-09	0.002408	- 18.549219 2	4.36E-08	827764.5
Gout	T2D	rs4678408	3	13805318 7	A	G	0.0002326	8.02E-08	19.801093 64	1.51E-08	848922.5
Gout	T2D	rs4711961	6	50833084	A	G	0.001785	2.87E-12	21.717032 97	2.98E-09	848831
Gout	T2D	rs4757615	11	18119884	T	C	6.09E-07	0.000106	- 19.337466 1	2.24E-08	848918.5
Gout	T2D	rs4930295	11	65390554	C	G	9.83E-08	1.07E-06	26.150349 65	7.06E-11	848846
Gout	T2D	rs5574424 7	5	52777864	A	G	8.78E-06	3.83E-06	20.618859 4	7.55E-09	827764.5

Gout	T2D	rs571312	18	57839769	A	C	1.37E-07	4.85E-13	38.284116 33	2.64E- 15	848895
Gout	T2D	rs6178137 3	1	40053093	A	C	0.02275	3.62E-18	19.781401 9	1.53E- 08	848770.5
Gout	T2D	rs6210625 8	2	417167	T	C	0.00153	6.79E-10	19.608542 29	1.78E- 08	824267
Gout	T2D	rs6453143	5	75023210	C	G	0.0007383	4.72E-11	22.248803 83	1.90E- 09	848769.5
Gout	T2D	rs6813703 6	6	43820215	A	G	8.63E-05	2.94E-12	- 27.568493 15	2.14E- 11	827764.5
Gout	T2D	rs738408	22	44324730	T	C	6.48E-12	1.17E-08	- 39.440789 47	1.00E- 15	824893.5
Gout	T2D	rs7471217 8	4	10292182	A	G	2.08E-14	0.004308	21.871580 55	2.61E- 09	827764.5
Gout	T2D	rs7834349 3	2	16550291 1	A	G	0.006849	2.34E-18	23.736616 25	5.41E- 10	848875
Gout	T2D	rs7945560	11	26608497	T	C	2.13E-08	0.0009326	18.655075 19	3.99E- 08	848922.5
Gout	T2D	rs7959831 3	1	27284913	T	C	3.01E-15	0.0008221	26.407766 99	5.68E- 11	847871
Gout	T2D	rs7971518	12	27951387	A	G	0.01239	5.60E-17	21.052631 58	5.23E- 09	848922.5

Gout	T2D	rs8032722	15	91522070	T	C	0.003672	2.66E-14	- 22.287453 02	1.84E- 09	845964
Gout	T2D	rs891368	3	53123273	A	G	1.42E-06	3.25E-09	28.569767 44	9.20E- 12	848922
Gout	T2D	rs9315009	13	31025452	T	C	2.12E-07	9.40E-07	25.547315 1	1.17E- 10	848787
Gout	TG	rs1027554 9	7	72914811	A	T	3.04E-05	5.15E-07	19.693063 35	5.56E- 09	411933.9 7
Gout	TG	rs1051368 8	3	17072721 8	A	G	0.0009275	1.54E-07	18.060362 17	2.52E- 08	469267.2 85
Gout	TG	rs1117213 4	12	57645789	A	T	1.09E-18	1.54E-09	52.443589 48	4.35E- 22	427301.5
Gout	TG	rs1241274 3	10	11404533 3	T	C	0.0007178	3.77E-07	18.295454 55	2.03E- 08	470832.0 3
Gout	TG	rs1242366 4	12	13306989 4	A	G	0.0004084	8.19E-08	18.563068 78	1.58E- 08	455163.5 2
Gout	TG	rs1358980	6	43764551	T	C	0.009041	6.02E-13	19.089058 52	9.72E- 09	470818
Gout	TG	rs1716233 0	1	27236212	T	C	1.70E-05	2.62E-08	24.843039 51	4.75E- 11	470783.4 95
Gout	TG	rs174580	11	61606642	A	G	0.004274	5.46E-16	23.280423 28	2.01E- 10	424390
Gout	TG	rs2066981	1	15517237 9	A	G	5.50E-09	0.0006955	- 20.486378 74	2.67E- 09	469753.0 5

Gout	TG	rs2384655	2	27952235	A	T	1.64E-05	1.35E-15	38.16893082	2.18E-16	425313.55
Gout	TG	rs2844559	6	31340075	T	C	0.000201	7.20E-16	- 29.82070707	4.79E-13	423719.5
Gout	TG	rs2943646	2	227099534	A	G	0.00599	6.23E-15	22.4547849	4.32E-10	469259.55
Gout	TG	rs33063	16	69640217	A	G	2.56E-10	0.0005176	22.22989673	5.32E-10	426664
Gout	TG	rs3775228	4	87985166	T	C	0.017	1.14E-13	18.73071895	1.35E-08	449651.5
Gout	TG	rs3936510	5	55860866	T	G	0.007556	1.09E-14	21.71359558	8.57E-10	469469.535
Gout	TG	rs4665376	2	27509032	T	C	1.03E-09	5.50E-18	54.20943396	8.60E-23	404159
Gout	TG	rs4717763	7	72825125	A	G	8.26E-07	2.73E-12	35.19962687	3.36E-15	424219
Gout	TG	rs4871601	8	126471577	A	G	0.002163	3.35E-14	22.87529301	2.93E-10	467937.605
Gout	TG	rs538656	18	57850422	T	G	2.19E-07	4.89E-05	20.69798658	2.19E-09	437133.5
Gout	TG	rs644740	11	65561468	T	C	5.01E-13	0.004265	21.18624709	1.40E-09	470679.5
Gout	TG	rs7011784	8	9690898	T	G	9.91E-05	9.76E-06	- 19.16283784	9.08E-09	470350.565

Gout	TG	rs7094971	10	61449564	A	G	1.97E-14	0.01544	19.092945 87	9.68E- 09	470835.5 15
Gout	TG	rs7508679	19	7222832	T	C	0.0001319	2.22E-09	24.111312 22	9.34E- 11	469206.5
Gout	TG	rs7607980	2	16555120 1	T	C	0.01188	2.41E-12	18.229948 72	2.15E- 08	470789.9 7
Gout	TG	rs7897379	10	65301725	T	C	0.0001779	1.27E-17	31.057136 25	1.53E- 13	449684
Gout	TG	rs879858	11	11657312 0	A	G	0.008641	3.16E-14	17.648624 23	3.69E- 08	426737.5 25
Gout	TG	rs993173	4	10323935	T	C	4.48E-19	0.06483	18.163011 46	2.29E- 08	427444
Hypertensi on	T2D	rs1040817 9	19	46157004	C	T	0.0032223	1.31E-18	25.885743 83	1.25E- 10	495303.5
Hypertensi on	T2D	rs1084299 5	12	27965566	T	C	0.0058369 1	3.08E-13	20.190850 64	1.42E- 08	495303.5
Hypertensi on	T2D	rs1164927 4	16	30026469	A	G	0.0002257 05	3.28E-10	23.117900 5	1.24E- 09	495303.5
Hypertensi on	T2D	rs1168868 2	2	12134761 2	C	G	0.0001321 41	2.93E-14	29.036374 12	9.17E- 12	495303.5
Hypertensi on	T2D	rs1333045	9	22119195	C	T	0.0053865 9	2.05E-15	22.044289 57	3.03E- 09	495303.5
Hypertensi on	T2D	rs1402522	8	9860588	C	T	0.0021282 9	1.04E-09	18.748488 67	4.72E- 08	495303.5
Hypertensi on	T2D	rs1991947	4	96118757	T	C	5.57E-05	1.01E-06	19.582364 83	2.35E- 08	495303.5

Hypertensi on	T2D	rs2074311	11	17421860	G	A	0.0017460 8	1.61E-17	26.627479 89	6.75E- 11	495303.5
Hypertensi on	T2D	rs2080385	2	65292762	T	G	0.0112625	1.24E-13	18.870757 96	4.26E- 08	495303.5
Hypertensi on	T2D	rs2245994	10	94085474	A	G	0.0130632	1.22E-14	19.157826 28	3.35E- 08	495303.5
Hypertensi on	T2D	rs255757	5	53309371	A	G	0.0006874 75	1.43E-12	24.127562 5	5.37E- 10	495303.5
Hypertensi on	T2D	rs3129860	6	32401079	G	A	0.0030203	1.49E-15	23.657929 7	7.93E- 10	495303.5
Hypertensi on	T2D	rs340836	1	21416306 9	T	C	0.0212508	5.49E-18	- 19.866697 26	1.86E- 08	495303.5
Hypertensi on	T2D	rs3589568 0	17	47060322	A	C	0.0002272 8	1.08E-15	29.578651 91	5.86E- 12	495303.5
Hypertensi on	T2D	rs545608	1	17789912 1	C	G	0.0045611	1.37E-11	19.070736 62	3.61E- 08	495303.5
Hypertensi on	T2D	rs563118	8	41521663	C	T	0.0080145 2	9.87E-13	18.885611 91	4.21E- 08	495303.5
Hypertensi on	T2D	rs6178137 3	1	40053093	C	A	0.0045887 9	3.62E-18	24.570843 1	3.72E- 10	495303.5
Hypertensi on	T2D	rs6245112 7	7	27971300	A	G	0.0002293 14	1.40E-08	20.951999 02	7.52E- 09	495303.5
Hypertensi on	T2D	rs6795735	3	64705365	T	C	0.0069956 2	2.84E-13	19.667042 12	2.19E- 08	495303.5

Hypertensi on	T2D	rs7262502 0	3	18559677 8	T	C	7.09E-05	1.15E-08	22.643785 23	1.84E- 09	495303.5
Hypertensi on	T2D	rs726816	8	95968413	G	T	0.0012913 6	3.11E-14	24.380967 15	4.35E- 10	495303.5
Hypertensi on	T2D	rs7770442 4	2	16114407 9	C	T	0.0002328 92	9.15E-08	19.613276 85	2.29E- 08	495303.5
Hypertensi on	T2D	rs9986109	4	6312976	A	G	0.0223699	1.81E-16	18.682372 3	4.98E- 08	495303.5
Hypertensi on	TG	rs1050918 9	10	65264126	C	T	0.0002861 03	3.07E-17	29.456375 06	5.76E- 13	115690.5 5
Hypertensi on	TG	rs1272628 7	1	27039228	T	C	9.05E-05	2.95E-09	24.139245 61	7.92E- 11	117192.0 1
Hypertensi on	TG	rs1763747 2	17	47461433	A	G	5.19E-06	1.21E-06	21.863886 56	6.53E- 10	116384
Hypertensi on	TG	rs1781796 4	16	53828066	T	C	0.0001194 89	4.12E-06	18.665791 27	1.27E- 08	116429
Hypertensi on	TG	rs2068888	10	94839642	A	G	0.0074116 8	1.68E-11	18.957899 9	9.70E- 09	117174.5
Hypertensi on	TG	rs236915	11	11708845 0	G	A	0.0179985	6.08E-17	20.646784 02	2.02E- 09	73825
Hypertensi on	TG	rs276	8	19814289	C	T	0.015472	7.02E-11	17.973331 1	2.42E- 08	70554.86 5
Hypertensi on	TG	rs2972143	2	22711636 5	G	A	0.0167647	5.15E-14	18.851952 67	1.07E- 08	117215.5

Hypertensi on	TG	rs3792253	2	28002002	C	T	0.0004422 52	1.61E-13	- 25.142684 99	3.12E- 11	73825
Hypertensi on	TG	rs3843467	5	55856375	T	G	0.0219771	4.34E-15	19.358835 04	6.68E- 09	117205.4 85
Hypertensi on	TG	rs437179	6	31929014	C	A	0.0200951	9.17E-19	20.605890 75	2.10E- 09	115327.5 5
Hypertensi on	TG	rs4478581	8	26487608	A	G	4.81E-05	4.12E-05	19.455231 45	6.11E- 09	73825
Hypertensi on	TG	rs4507059	2	21143329	G	A	0.0004435 47	2.92E-09	- 22.245577 57	4.58E- 10	116460.4 5
Hypertensi on	TG	rs4871601	8	12647157 7	G	A	0.0096200 3	3.35E-14	19.330909 08	6.86E- 09	114440.6 05
Hypertensi on	TG	rs998584	6	43757896	A	C	0.016084	3.42E-15	18.960406 81	9.68E- 09	115605
T2D	TG	rs1040884 4	19	7244884	T	C	1.35E-07	0.0001396	21.109675 57	2.88E- 08	554585.5 15
T2D	TG	rs1078603 7	10	94109870	A	G	7.07E-14	0.01267	24.021603 93	3.10E- 09	512491.5
T2D	TG	rs1080192 2	1	11752945 8	A	G	2.06E-12	0.004772	20.748337 77	3.80E- 08	512479
T2D	TG	rs1105740 8	12	12446483 6	T	G	5.62E-06	2.05E-12	33.496638 66	2.28E- 12	554212
T2D	TG	rs1106306 9	12	4374373	A	G	9.94E-13	0.0002976	26.582278 48	4.38E- 10	553108.5 05

T2D	TG	rs1167755 7	2	12131774 7	A	G	5.66E-11	0.0003682	25.367149 76	1.11E- 09	555757.9 5
T2D	TG	rs1172013 0	3	12156316	A	G	1.91E-16	0.0005475	29.149702 97	6.20E- 11	555855.2 5
T2D	TG	rs1232867 5	2	16554080 0	T	C	1.95E-18	1.81E-12	63.453406 1	3.41E- 22	555882.4 85
T2D	TG	rs1245471 2	18	60845884	T	C	2.40E-12	0.0003693	27.339366 52	2.46E- 10	551586
T2D	TG	rs1298227 6	19	19459800	T	C	7.00E-09	1.57E-16	- 49.733167 97	1.05E- 17	506696.5
T2D	TG	rs1313354 8	4	89740128	A	G	3.26E-08	2.11E-07	30.335937 5	2.51E- 11	555264
T2D	TG	rs1324923 4	8	9650401	T	C	4.61E-09	1.34E-06	- 30.652173 91	1.98E- 11	555729.5
T2D	TG	rs1364422	7	13044598 1	T	C	5.14E-14	9.27E-09	45.091739 63	3.50E- 16	555882.5 1
T2D	TG	rs1534696	7	26397239	A	C	5.72E-05	4.39E-07	21.082031 25	2.94E- 08	547181
T2D	TG	rs174562	11	61585144	A	G	1.97E-05	4.82E-17	- 36.414255 25	2.49E- 13	510354.4 5
T2D	TG	rs2075650	19	45395619	A	G	1.00E-11	2.31E-21	- 60.623458 17	2.87E- 21	550021.0 1

T2D	TG	rs2168708	18	57907311	T	G	1.12E-12	6.20E-06	32.865828 09	3.68E- 12	511727.5
T2D	TG	rs2250802	10	11392135 4	A	G	0.0007883	1.21E-10	20.925009 52	3.32E- 08	554351.9 7
T2D	TG	rs2252867	2	65296280	T	C	3.05E-16	1.12E-06	39.872549 02	1.81E- 14	555887.4 5
T2D	TG	rs2384655	2	27952235	A	T	0.0009915	1.35E-15	- 29.201886 79	5.96E- 11	510364.0 5
T2D	TG	rs2613503	1	72839774	A	C	1.27E-07	0.0001417	20.692911 18	3.96E- 08	555893.5 1
T2D	TG	rs2665357	6	16084816 7	A	C	8.32E-09	8.33E-10	36.939393 94	1.67E- 13	553410
T2D	TG	rs2790766	10	80960616	A	G	7.86E-19	0.001978	26.170280 61	6.00E- 10	512476.5
T2D	TG	rs2908290	7	44216137	A	G	1.56E-07	1.45E-06	25.749554 37	8.27E- 10	555867.5
T2D	TG	rs2925979	16	81534790	T	C	7.07E-15	2.14E-07	44.416666 67	5.83E- 16	555090.4 5
T2D	TG	rs2929279	15	44250054	C	G	0.005939	1.50E-16	- 24.524765 73	2.11E- 09	549391.6 1
T2D	TG	rs2943637	2	22708857 7	A	C	2.64E-16	6.77E-09	46.929910 71	8.74E- 17	550650
T2D	TG	rs3508941 1	19	46189861	T	C	4.49E-09	0.0001522	24.004004	3.14E- 09	510335.5 1

T2D	TG	rs3761445	22	38595411	A	G	0.0002317	8.06E-12	25.089592 76	1.37E- 09	554908.0 5
T2D	TG	rs3814730	11	72555553	A	G	6.96E-17	0.01629	- 24.051332 03	3.03E- 09	510367
T2D	TG	rs3847326	10	65331859	A	G	8.11E-06	1.40E-10	28.424202 13	1.08E- 10	512491.5
T2D	TG	rs4665376	2	27509032	T	C	3.70E-05	5.50E-18	- 36.850566 04	1.79E- 13	510364.5
T2D	TG	rs4704546	5	78520731	A	G	1.92E-10	0.00206	20.775401 07	3.72E- 08	555854.5
T2D	TG	rs4775041	15	58674695	C	G	0.0003278	4.83E-16	- 30.221052 63	2.74E- 11	554948.5
T2D	TG	rs4804833	19	7970635	A	G	3.42E-13	9.90E-06	29.680589 68	4.14E- 11	546386.5
T2D	TG	rs485774	6	32290954	A	G	1.93E-09	2.18E-09	35.333333 33	5.65E- 13	547280.5
T2D	TG	rs4871624	8	12662932 8	T	G	0.001236	1.07E-11	22.238294 63	1.21E- 08	555734.9 95
T2D	TG	rs4886722	15	75921636	A	C	1.24E-09	0.002797	- 20.981880 34	3.17E- 08	553630.4 85
T2D	TG	rs4938343	11	11700352 8	C	G	0.0003299	1.75E-15	29.271775 63	5.65E- 11	512491.5

T2D	TG	rs4976033	5	67714246	A	G	5.72E-08	0.0002014	21.244949 49	2.59E- 08	555862.5
T2D	TG	rs5396	3	17074481 5	T	C	6.89E-19	0.002218	- 29.110011 42	6.39E- 11	555850.4 85
T2D	TG	rs587404	1	39908506	A	G	4.51E-19	6.51E-07	40.605405 41	1.04E- 14	555856
T2D	TG	rs6066141	20	45597546	T	C	8.68E-10	2.34E-08	34.478773 58	1.08E- 12	511727.5
T2D	TG	rs634869	6	13983175 7	T	C	2.62E-06	1.78E-14	38.675990 68	4.49E- 14	555862.5
T2D	TG	rs645040	3	13592662 2	T	G	2.98E-06	1.83E-12	34.437012 99	1.12E- 12	555874.4 85
T2D	TG	rs6545714	2	59307725	A	G	2.25E-08	0.0001355	23.816742 08	3.62E- 09	555896
T2D	TG	rs6938091	6	20522290	A	G	8.64E-13	0.0002826	28.970426 83	7.10E- 11	555858.5 3
T2D	TG	rs7132277	12	12359338 2	T	C	6.02E-09	0.001721	20.611174 13	4.22E- 08	555156.4 95
T2D	TG	rs7187961	16	53826034	T	C	3.43E-18	0.005656	22.49	9.99E- 09	510347.5 05
T2D	TG	rs731839	19	33899065	A	G	1.83E-07	2.65E-09	32.483660 13	4.91E- 12	555065.5 5
T2D	TG	rs765751	1	21966922 6	T	C	1.55E-13	1.98E-06	36.242869 88	2.83E- 13	555419

T2D	TG	rs7808044 0	8	19826992	A	G	0.0002303	1.31E-14	32.196574 83	6.11E- 12	510357.4 35
T2D	TG	rs8180991	8	12650035 0	C	G	0.009954	6.82E-14	- 20.542434 21	4.45E- 08	555823.0 2
T2D	TG	rs879858	11	11657312 0	A	G	0.001751	3.16E-14	21.034146 34	3.05E- 08	511826.5 25
T2D	TG	rs911303	20	57387887	A	G	1.86E-10	0.005023	- 20.574448 53	4.34E- 08	551329
T2D	TG	rs9273363	6	32626272	A	C	2.21E-18	1.42E-08	- 51.529560 2	2.72E- 18	553932.5
T2D	TG	rs9289218	3	12306483 1	T	C	6.99E-12	0.003696	-20.53125	4.49E- 08	555844
T2D	TG	rs9491689	6	12739859 5	A	C	1.39E-08	1.73E-07	28.912067	7.43E- 11	555889.9 5
T2D	TG	rs9686661	5	55861786	T	C	4.35E-18	2.54E-16	74.371396 9	9.27E- 26	555510.0 05
T2D	TG	rs998584	6	43757896	A	C	2.25E-08	3.42E-15	44.224116 42	6.75E- 16	554271.5

AAD: Acute aortic dissection; SNPs: single-nucleotide polymorphisms; PLACO: pleiotropic analysis under composite null hypothesis; TAA: thoracic aortic aneurysm; TG: triglyceride; T2D: type 2 diabetes.

Supplementary Table 6. Mendelian randomization analysis among paired metabolic diseases via the IVW method

Exposures	Outcomes	Methods	BETA	SE	OR	Down	Up	Estimate	Pval
Obesity	T2D	IVW	0.392	0.038	1.480	1.374	1.595	1.48 (1.374, 1.595)	4.66E-25
T2D	Hypertension	IVW	0.206	0.024	1.229	1.173	1.288	1.229 (1.173, 1.288)	7.19E-18
Obesity	TG	IVW	0.070	0.012	1.073	1.048	1.099	1.073 (1.048, 1.099)	7.14E-09
TG	Hypertension	IVW	0.250	0.055	1.284	1.153	1.430	1.284 (1.153, 1.43)	5.07E-06
Obesity	Hypertension	IVW	0.164	0.038	1.178	1.094	1.268	1.178 (1.094, 1.268)	1.39E-05
Obesity	Gout	IVW	0.217	0.059	1.243	1.107	1.395	1.243 (1.107, 1.395)	2.20E-04
T2D	Gout	IVW	0.091	0.025	1.095	1.042	1.151	1.095 (1.042, 1.151)	3.69E-04
T2D	TG	IVW	0.037	0.011	1.038	1.015	1.061	1.038 (1.015, 1.061)	9.75E-04
Gout	Hypertension	IVW	0.076	0.024	1.079	1.031	1.130	1.079 (1.031, 1.13)	1.18E-03
Gout	TG	IVW	0.049	0.018	1.051	1.013	1.089	1.051 (1.013, 1.089)	0.007
TG	AAD	IVW	0.484	0.193	1.623	1.112	2.368	1.623 (1.112, 2.368)	0.012
TG	Gout	IVW	0.207	0.087	1.229	1.038	1.457	1.229 (1.038, 1.457)	0.017
T2D	TAA	IVW	-0.142	0.060	0.868	0.771	0.976	0.868 (0.771, 0.976)	0.018
TG	T2D	IVW	0.238	0.107	1.269	1.029	1.564	1.269 (1.029, 1.564)	0.026
TG	TAA	IVW	0.251	0.146	1.285	0.966	1.710	1.285 (0.966, 1.71)	0.085
TAA	Hypertension	IVW	-0.081	0.051	0.922	0.834	1.020	0.922 (0.834, 1.02)	0.114
Gout	T2D	IVW	0.019	0.017	1.019	0.986	1.054	1.019 (0.986, 1.054)	0.257
Gout	Obesity	IVW	0.042	0.045	1.043	0.954	1.139	1.043 (0.954, 1.139)	0.357
Obesity	TAA	IVW	-0.079	0.105	0.924	0.752	1.137	0.924 (0.752, 1.137)	0.456
Hypertension	Gout	IVW	-0.077	0.103	0.926	0.757	1.133	0.926 (0.757, 1.133)	0.456
TAA	Obesity	IVW	-0.035	0.052	0.965	0.872	1.069	0.965 (0.872, 1.069)	0.495
Hypertension	T2D	IVW	-0.048	0.081	0.953	0.814	1.116	0.953 (0.814, 1.116)	0.550

T2D	AAD	IVW	-0.038	0.066	0.963	0.846	1.096	0.963 (0.846, 1.096)	0.566
AAD	TAA	IVW	-0.096	0.172	0.908	0.648	1.273	0.908 (0.648, 1.273)	0.577
TAA	T2D	IVW	0.013	0.026	1.014	0.964	1.066	1.014 (0.964, 1.066)	0.601
TAA	TG	IVW	0.010	0.019	1.010	0.973	1.049	1.01 (0.973, 1.049)	0.604
AAD	Gout	IVW	0.016	0.032	1.017	0.955	1.082	1.017 (0.955, 1.082)	0.608
Hypertension	TAA	IVW	0.142	0.278	1.153	0.668	1.990	1.153 (0.668, 1.99)	0.609
Obesity	AAD	IVW	-0.056	0.115	0.946	0.755	1.185	0.946 (0.755, 1.185)	0.629
T2D	Obesity	IVW	-0.020	0.042	0.980	0.902	1.065	0.98 (0.902, 1.065)	0.634
Hypertension	AAD	IVW	-0.205	0.431	0.815	0.350	1.898	0.815 (0.35, 1.898)	0.635
Hypertension	TG	IVW	-0.018	0.045	0.982	0.899	1.072	0.982 (0.899, 1.072)	0.682
TG	Obesity	IVW	-0.020	0.077	0.980	0.843	1.140	0.98 (0.843, 1.14)	0.798
AAD	Hypertension	IVW	0.006	0.071	1.006	0.874	1.157	1.006 (0.874, 1.157)	0.936
Gout	TAA	IVW	0.003	0.050	1.003	0.910	1.106	1.003 (0.91, 1.106)	0.948
Hypertension	Obesity	IVW	0.007	0.185	1.007	0.701	1.446	1.007 (0.701, 1.446)	0.970
AAD	T2D	IVW	0.000	0.016	1.000	0.970	1.032	1 (0.97, 1.032)	0.976
Gout	AAD	IVW	0.000	0.058	1.000	0.894	1.120	1 (0.894, 1.12)	0.995
TAA	Gout	IVW	0.000	0.051	1.000	0.904	1.106	1 (0.904, 1.106)	0.996

IVW: Inverse-variance weighted.

Supplementary Table 7. Summary results of the sensitivity analysis

Exposures	Outcomes	Methods	BETA	SE	OR	Down	Up	Pval	Heter.est	Heter.Pval
Obesity	AAD	IVW_fix	-0.056	0.115	0.946	0.755	1.185	0.629	14.049	0.522
Obesity	AAD	Egger_slope	0.180	0.326	1.198	0.604	2.375	0.581		
Obesity	AAD	Egger_intercept	-0.028	0.037	-0.028	-0.106	0.049	0.442		
Obesity	AAD	weighted_mode	-0.140	0.217	0.869	0.568	1.332	0.520		
Obesity	AAD	weighted_Median	-0.084	0.168	0.919	0.661	1.278	0.618		
Obesity	AAD	DIVW	-0.057	0.117	0.945	0.752	1.188	0.629		
Obesity	AAD	MR-RAPS	-0.056	0.117	0.945	0.751	1.189	0.630		
Obesity	TAA	IVW_fix	-0.079	0.105	0.924	0.752	1.137	0.456	11.563	0.712
Obesity	TAA	Egger_slope	0.377	0.308	1.458	0.797	2.669	0.221		
Obesity	TAA	Egger_intercept	-0.051	0.033	-0.051	-0.115	0.013	0.116		
Obesity	TAA	weighted_mode	-0.037	0.196	0.964	0.656	1.416	0.852		
Obesity	TAA	weighted_Median	-0.075	0.150	0.927	0.691	1.245	0.615		
Obesity	TAA	DIVW	-0.080	0.107	0.923	0.748	1.139	0.456		
Obesity	TAA	MR-RAPS	-0.080	0.108	0.923	0.748	1.140	0.459		
Obesity	Gout	IVW_random	0.217	0.059	1.243	1.107	1.395	0.000	33.437	0.002
Obesity	Gout	Egger_slope	0.236	0.226	1.267	0.777	2.065	0.315		
Obesity	Gout	Egger_intercept	-0.002	0.022	-0.002	-0.049	0.045	0.931		
Obesity	Gout	weighted_mode	0.286	0.078	1.331	1.141	1.552	0.000		
Obesity	Gout	weighted_Median	0.239	0.058	1.270	1.132	1.423	0.000		

Obesity	Gout	DIVW	0.222	0.057	1.248	1.116	1.397	0.000		
Obesity	Gout	MR-RAPS	0.227	0.039	1.255	1.162	1.356	0.000		
Obesity	Hypertension	IVW_fix	0.164	0.038	1.178	1.094	1.268	0.000	16.580	0.279
Obesity	Hypertension	Egger_slope	0.196	0.160	1.216	0.861	1.718	0.242		
Obesity	Hypertension	Egger_intercept	-0.003	0.016	-0.003	-0.038	0.031	0.837		
Obesity	Hypertension	weighted_mode	0.175	0.080	1.191	1.018	1.394	0.029		
Obesity	Hypertension	weighted_Median	0.157	0.053	1.170	1.055	1.297	0.003		
Obesity	Hypertension	DIVW	0.167	0.040	1.182	1.092	1.279	0.000		
Obesity	Hypertension	MR-RAPS	0.167	0.039	1.182	1.095	1.275	0.000		
Obesity	T2D	IVW_random	0.392	0.038	1.480	1.374	1.595	0.000	34.482	0.000
Obesity	T2D	Egger_slope	0.375	0.186	1.455	0.961	2.202	0.072		
Obesity	T2D	Egger_intercept	0.002	0.018	0.002	-0.038	0.041	0.925		
Obesity	T2D	weighted_mode	0.408	0.047	1.505	1.373	1.648	0.000		
Obesity	T2D	weighted_Median	0.402	0.037	1.495	1.389	1.609	0.000		
Obesity	T2D	DIVW	0.401	0.037	1.493	1.388	1.605	0.000		
Obesity	T2D	MR-RAPS	0.406	0.028	1.501	1.422	1.585	0.000		
Obesity	TG	IVW_fix	0.070	0.012	1.073	1.048	1.099	0.000	11.295	0.335

Obesity	TG	Egger_slope	0.025	0.044	1.025	0.928	1.132	0.589		
Obesity	TG	Egger_intercept	0.004	0.004	0.004	-0.005	0.013	0.305		
Obesity	TG	weighted_mode	0.053	0.023	1.055	1.009	1.102	0.019		
Obesity	TG	weighted_Median	0.056	0.017	1.058	1.023	1.094	0.001		
Obesity	TG	DIVW	0.072	0.013	1.075	1.048	1.102	0.000		
Obesity	TG	MR-RAPS	0.072	0.013	1.075	1.048	1.102	0.000		
AAD	TAA	IVW_fix	-0.096	0.172	0.908	0.648	1.273	0.577	/	/
AAD	TAA	Egger_slope	/	/	/	/	/	/		
AAD	TAA	Egger_intercept	/	/	/	/	/	/		
AAD	TAA	weighted_mode	/	/	/	/	/	/		
AAD	TAA	weighted_Median	/	/	/	/	/	/		
AAD	TAA	DIVW	-0.099	0.179	0.905	0.638	1.286	0.579		
AAD	TAA	MR-RAPS	-0.096	0.182	0.908	0.636	1.297	0.596		
AAD	Gout	IVW_fix	0.016	0.032	1.017	0.955	1.082	0.608	0.227	0.634
AAD	Gout	Egger_slope	/	/	/	/	/	/		
AAD	Gout	Egger_intercept	/	/	/	/	/	/		
AAD	Gout	weighted_mode	/	/	/	/	/	/		
AAD	Gout	weighted_Median	/	/	/	/	/	/		
AAD	Gout	DIVW	0.017	0.033	1.017	0.954	1.085	0.608		
AAD	Gout	MR-RAPS	0.016	0.033	1.017	0.953	1.085	0.620		
AAD	Hypertension	IVW_random	0.006	0.071	1.006	0.874	1.157	0.936	5.063	0.024

AAD	Hypertension	Egger_slope	/	/	/	/	/	/		
AAD	Hypertension	Egger_intercept	/	/	/	/	/	/		
AAD	Hypertension	weighted_mode	/	/	/	/	/	/		
AAD	Hypertension	weighted_Median	/	/	/	/	/	/		
AAD	Hypertension	DIVW	0.006	0.050	1.006	0.912	1.109	0.906		
AAD	Hypertension	MR-RAPS	0.006	0.032	1.006	0.945	1.071	0.848		
AAD	T2D	IVW_fix	0.000	0.016	1.000	0.970	1.032	0.976	3.457	0.063
AAD	T2D	Egger_slope	/	/	/	/	/	/		
AAD	T2D	Egger_intercept	/	/	/	/	/	/		
AAD	T2D	weighted_mode	/	/	/	/	/	/		
AAD	T2D	weighted_Median	/	/	/	/	/	/		
AAD	T2D	DIVW	0.000	0.021	1.000	0.961	1.042	0.981		
AAD	T2D	MR-RAPS	0.001	0.016	1.001	0.970	1.032	0.975		
TAA	Obesity	IVW_fix	-0.035	0.052	0.965	0.872	1.069	0.495	/	/
TAA	Obesity	Egger_slope	/	/	/	/	/	/		
TAA	Obesity	Egger_intercept	/	/	/	/	/	/		
TAA	Obesity	weighted_mode	/	/	/	/	/	/		

TAA	Obesity	weighted_Median	/	/	/	/	/	/		
TAA	Obesity	DIVW	-0.036	0.054	0.964	0.868	1.071	0.498		
TAA	Obesity	MR-RAPS	-0.035	0.054	0.965	0.868	1.074	0.515		
TAA	Gout	IVW_fix	0.000	0.051	1.000	0.904	1.106	0.996	/	/
TAA	Gout	Egger_slope	/	/	/	/	/	/		
TAA	Gout	Egger_intercept	/	/	/	/	/	/		
TAA	Gout	weighted_mode	/	/	/	/	/	/		
TAA	Gout	weighted_Median	/	/	/	/	/	/		
TAA	Gout	DIVW	0.000	0.053	1.000	0.902	1.109	0.996		
TAA	Gout	MR-RAPS	0.000	0.054	1.000	0.900	1.111	0.996		
TAA	Hypertension	IVW_fix	-0.081	0.051	0.922	0.834	1.020	0.114	/	/
TAA	Hypertension	Egger_slope	/	/	/	/	/	/		
TAA	Hypertension	Egger_intercept	/	/	/	/	/	/		
TAA	Hypertension	weighted_mode	/	/	/	/	/	/		
TAA	Hypertension	weighted_Median	/	/	/	/	/	/		
TAA	Hypertension	DIVW	-0.083	0.055	0.920	0.827	1.024	0.127		

TAA	Hypertensio n	MR-RAPS	-0.081	0.055	0.922	0.828	1.027	0.141		
TAA	T2D	IVW_fix	0.013	0.026	1.014	0.964	1.066	0.601	/	/
TAA	T2D	Egger_slope	/	/	/	/	/	/		
TAA	T2D	Egger_intercept	/	/	/	/	/	/		
TAA	T2D	weighted_mode	/	/	/	/	/	/		
TAA	T2D	weighted_Media n	/	/	/	/	/	/		
TAA	T2D	DIVW	0.014	0.027	1.014	0.963	1.068	0.602		
TAA	T2D	MR-RAPS	0.013	0.027	1.014	0.961	1.068	0.617		
TAA	TG	IVW_fix	0.010	0.019	1.010	0.973	1.049	0.604	/	/
TAA	TG	Egger_slope	/	/	/	/	/	/		
TAA	TG	Egger_intercept	/	/	/	/	/	/		
TAA	TG	weighted_mode	/	/	/	/	/	/		
TAA	TG	weighted_Media n	/	/	/	/	/	/		
TAA	TG	DIVW	0.010	0.020	1.010	0.972	1.050	0.606		
TAA	TG	MR-RAPS	0.010	0.020	1.010	0.971	1.050	0.620		
Gout	Obesity	IVW_fix	0.042	0.045	1.043	0.954	1.139	0.357	3.095	0.928
Gout	Obesity	Egger_slope	-0.130	0.216	0.878	0.575	1.340	0.546		
Gout	Obesity	Egger_intercept	0.019	0.023	0.019	-0.027	0.065	0.415		
Gout	Obesity	weighted_mode	0.057	0.081	1.059	0.904	1.240	0.478		
Gout	Obesity	weighted_Media n	0.045	0.058	1.046	0.934	1.172	0.436		
Gout	Obesity	DIVW	0.043	0.046	1.043	0.953	1.142	0.357		

Gout	Obesity	MR-RAPS	0.042	0.046	1.043	0.952	1.142	0.367		
Gout	AAD	IVW_fix	0.000	0.058	1.000	0.894	1.120	0.995	22.134	0.955
Gout	AAD	Egger_slope	-0.033	0.081	0.968	0.825	1.135	0.688		
Gout	AAD	Egger_intercept	0.009	0.015	0.009	-0.021	0.039	0.566		
Gout	AAD	weighted_mode	-0.070	0.079	0.932	0.799	1.088	0.374		
Gout	AAD	weighted_Median	-0.041	0.088	0.960	0.809	1.140	0.643		
Gout	AAD	DIVW	0.000	0.059	1.000	0.892	1.122	0.995		
Gout	AAD	MR-RAPS	0.000	0.059	1.000	0.891	1.123	0.995		
Gout	TAA	IVW_fix	0.003	0.050	1.003	0.910	1.106	0.948	40.015	0.683
Gout	TAA	Egger_slope	0.037	0.066	1.038	0.911	1.182	0.576		
Gout	TAA	Egger_intercept	-0.010	0.013	-0.010	-0.036	0.016	0.444		
Gout	TAA	weighted_mode	0.021	0.063	1.021	0.903	1.156	0.736		
Gout	TAA	weighted_Median	0.025	0.080	1.026	0.877	1.199	0.751		
Gout	TAA	DIVW	0.003	0.050	1.003	0.909	1.107	0.948		
Gout	TAA	MR-RAPS	0.003	0.050	1.003	0.909	1.108	0.948		
Gout	Hypertension	IVW_fix	0.076	0.024	1.079	1.031	1.130	0.001	37.125	0.245
Gout	Hypertension	Egger_slope	0.024	0.048	1.024	0.928	1.129	0.625		
Gout	Hypertension	Egger_intercept	0.009	0.007	0.009	-0.005	0.022	0.208		
Gout	Hypertension	weighted_mode	0.079	0.051	1.082	0.978	1.196	0.125		

Gout	Hypertension	weighted_Median	0.070	0.035	1.072	1.001	1.149	0.046		
Gout	Hypertension	DIVW	0.078	0.026	1.081	1.028	1.137	0.002		
Gout	Hypertension	MR-RAPS	0.078	0.024	1.081	1.031	1.133	0.001		
Gout	T2D	IVW_random	0.019	0.017	1.019	0.986	1.054	0.257	154.347	0.000
Gout	T2D	Egger_slope	0.010	0.024	1.010	0.961	1.061	0.692		
Gout	T2D	Egger_intercept	0.003	0.005	0.003	-0.007	0.012	0.577		
Gout	T2D	weighted_mode	0.012	0.011	1.012	0.990	1.035	0.282		
Gout	T2D	weighted_Median	0.007	0.012	1.007	0.984	1.030	0.556		
Gout	T2D	DIVW	0.020	0.017	1.020	0.986	1.055	0.258		
Gout	T2D	MR-RAPS	0.020	0.008	1.020	1.005	1.036	0.012		
Gout	TG	IVW_fix	0.049	0.018	1.051	1.013	1.089	0.007	7.945	0.337
Gout	TG	Egger_slope	0.079	0.120	1.082	0.807	1.451	0.535		
Gout	TG	Egger_intercept	-0.003	0.012	-0.003	-0.034	0.027	0.811		
Gout	TG	weighted_mode	0.064	0.030	1.066	1.005	1.131	0.033		
Gout	TG	weighted_Median	0.061	0.025	1.063	1.012	1.117	0.015		
Gout	TG	DIVW	0.050	0.019	1.052	1.013	1.092	0.008		
Gout	TG	MR-RAPS	0.050	0.019	1.052	1.013	1.092	0.008		
Hypertension	Obesity	IVW_fix	0.007	0.185	1.007	0.701	1.446	0.970	/	/

Hypertension	Obesity	Egger_slope	/	/	/	/	/	/		
Hypertension	Obesity	Egger_intercept	/	/	/	/	/	/		
Hypertension	Obesity	weighted_mode	/	/	/	/	/	/		
Hypertension	Obesity	weighted_Median	/	/	/	/	/	/		
Hypertension	Obesity	DIVW	0.007	0.190	1.007	0.694	1.462	0.970		
Hypertension	Obesity	MR-RAPS	0.007	0.193	1.007	0.690	1.470	0.971		
Hypertension	AAD	IVW_fix	-0.205	0.431	0.815	0.350	1.898	0.635	0.897	0.344
Hypertension	AAD	Egger_slope	/	/	/	/	/	/		
Hypertension	AAD	Egger_intercept	/	/	/	/	/	/		
Hypertension	AAD	weighted_mode	/	/	/	/	/	/		
Hypertension	AAD	weighted_Median	/	/	/	/	/	/		
Hypertension	AAD	DIVW	-0.211	0.445	0.810	0.338	1.938	0.636		
Hypertension	AAD	MR-RAPS	-0.208	0.449	0.813	0.337	1.961	0.644		

Hypertension	TAA	IVW_fix	0.142	0.278	1.153	0.668	1.990	0.609	2.288	0.319
Hypertension	TAA	Egger_slope	1.421	2.073	4.141	0.000	##### #	0.617		
Hypertension	TAA	Egger_intercept	-0.134	0.215	-0.134	-2.864	2.595	0.644		
Hypertension	TAA	weighted_mode	0.377	0.401	1.458	0.664	3.202	0.347		
Hypertension	TAA	weighted_Median	0.264	0.342	1.302	0.666	2.543	0.441		
Hypertension	TAA	DIVW	0.146	0.286	1.157	0.661	2.026	0.609		
Hypertension	TAA	MR-RAPS	0.145	0.287	1.156	0.659	2.028	0.613		
Hypertension	Gout	IVW_fix	-0.077	0.103	0.926	0.757	1.133	0.456	1.389	0.239
Hypertension	Gout	Egger_slope	/	/	/	/	/	/		
Hypertension	Gout	Egger_intercept	/	/	/	/	/	/		
Hypertension	Gout	weighted_mode	/	/	/	/	/	/		
Hypertension	Gout	weighted_Median	/	/	/	/	/	/		
Hypertension	Gout	DIVW	-0.079	0.106	0.924	0.751	1.137	0.457		

Hypertension	Gout	MR-RAPS	-0.078	0.106	0.925	0.751	1.139	0.462		
Hypertension	T2D	IVW_random	-0.048	0.081	0.953	0.814	1.116	0.550	7.137	0.028
Hypertension	T2D	Egger_slope	-0.645	0.267	0.525	0.018	15.663	0.250		
Hypertension	T2D	Egger_intercept	0.063	0.028	0.063	-0.290	0.415	0.265		
Hypertension	T2D	weighted_mode	-0.111	0.055	0.895	0.804	0.997	0.044		
Hypertension	T2D	weighted_Median	-0.086	0.058	0.917	0.819	1.028	0.137		
Hypertension	T2D	DIVW	-0.049	0.069	0.952	0.832	1.089	0.472		
Hypertension	T2D	MR-RAPS	-0.051	0.043	0.950	0.873	1.034	0.237		
Hypertension	TG	IVW_fix	-0.018	0.045	0.982	0.899	1.072	0.682	/	/
Hypertension	TG	Egger_slope	/	/	/	/	/	/		
Hypertension	TG	Egger_intercept	/	/	/	/	/	/		
Hypertension	TG	weighted_mode	/	/	/	/	/	/		
Hypertension	TG	weighted_Median	/	/	/	/	/	/		

Hypertension	TG	DIVW	-0.019	0.046	0.981	0.896	1.075	0.682		
Hypertension	TG	MR-RAPS	-0.018	0.047	0.982	0.895	1.077	0.695		
T2D	Obesity	IVW_random	-0.020	0.042	0.980	0.902	1.065	0.634	200.564	0.000
T2D	Obesity	Egger_slope	-0.244	0.132	0.784	0.603	1.019	0.068		
T2D	Obesity	Egger_intercept	0.014	0.008	0.014	-0.002	0.030	0.078		
T2D	Obesity	weighted_mode	-0.136	0.090	0.873	0.732	1.041	0.130		
T2D	Obesity	weighted_Median	-0.065	0.046	0.937	0.856	1.026	0.162		
T2D	Obesity	DIVW	-0.020	0.043	0.980	0.900	1.067	0.638		
T2D	Obesity	MR-RAPS	-0.021	0.027	0.979	0.929	1.032	0.435		
T2D	AAD	IVW_fix	-0.038	0.066	0.963	0.846	1.096	0.566	163.435	0.606
T2D	AAD	Egger_slope	0.064	0.158	1.066	0.783	1.452	0.685		
T2D	AAD	Egger_intercept	-0.007	0.010	-0.007	-0.027	0.013	0.477		
T2D	AAD	weighted_mode	-0.106	0.168	0.900	0.648	1.249	0.528		
T2D	AAD	weighted_Median	-0.071	0.104	0.931	0.760	1.142	0.495		
T2D	AAD	DIVW	-0.038	0.067	0.962	0.844	1.097	0.566		
T2D	AAD	MR-RAPS	-0.038	0.067	0.962	0.844	1.097	0.567		
T2D	TAA	IVW_fix	-0.142	0.060	0.868	0.771	0.976	0.018	164.353	0.743
T2D	TAA	Egger_slope	-0.355	0.159	0.701	0.513	0.958	0.026		
T2D	TAA	Egger_intercept	0.014	0.010	0.014	-0.005	0.034	0.148		
T2D	TAA	weighted_mode	-0.120	0.161	0.887	0.647	1.216	0.456		

T2D	TAA	weighted_Median	-0.166	0.092	0.847	0.707	1.014	0.071		
T2D	TAA	DIVW	-0.144	0.061	0.866	0.768	0.976	0.019		
T2D	TAA	MR-RAPS	-0.144	0.061	0.866	0.768	0.976	0.019		
T2D	Gout	IVW_random	0.091	0.025	1.095	1.042	1.151	0.000	307.970	0.000
T2D	Gout	Egger_slope	-0.070	0.066	0.933	0.819	1.062	0.293		
T2D	Gout	Egger_intercept	0.011	0.004	0.011	0.003	0.019	0.009		
T2D	Gout	weighted_mode	-0.003	0.075	0.997	0.861	1.154	0.970		
T2D	Gout	weighted_Median	0.062	0.031	1.064	1.000	1.131	0.050		
T2D	Gout	DIVW	0.092	0.026	1.096	1.042	1.153	0.000		
T2D	Gout	MR-RAPS	0.093	0.019	1.098	1.057	1.140	0.000		
T2D	Hypertension	IVW_random	0.206	0.024	1.229	1.173	1.288	0.000	230.215	0.001
T2D	Hypertension	Egger_slope	0.073	0.061	1.076	0.953	1.213	0.235		
T2D	Hypertension	Egger_intercept	0.009	0.004	0.009	0.001	0.016	0.019		
T2D	Hypertension	weighted_mode	0.090	0.056	1.094	0.980	1.222	0.109		
T2D	Hypertension	weighted_Median	0.151	0.033	1.162	1.090	1.239	0.000		
T2D	Hypertension	DIVW	0.210	0.024	1.233	1.176	1.293	0.000		

T2D	Hypertension	MR-RAPS	0.211	0.021	1.235	1.186	1.286	0.000		
T2D	TG	IVW_random	0.037	0.011	1.038	1.015	1.061	0.001	179.314	0.000
T2D	TG	Egger_slope	0.006	0.030	1.006	0.948	1.068	0.832		
T2D	TG	Egger_intercept	0.002	0.002	0.002	-0.002	0.006	0.270		
T2D	TG	weighted_mode	0.042	0.015	1.043	1.013	1.074	0.004		
T2D	TG	weighted_Median	0.045	0.012	1.046	1.021	1.072	0.000		
T2D	TG	DIVW	0.037	0.012	1.038	1.014	1.063	0.002		
T2D	TG	MR-RAPS	0.038	0.008	1.039	1.024	1.054	0.000		
TG	Obesity	IVW_random	-0.020	0.077	0.980	0.843	1.140	0.798	87.461	0.000
TG	Obesity	Egger_slope	0.152	0.165	1.164	0.835	1.625	0.362		
TG	Obesity	Egger_intercept	-0.008	0.006	-0.008	-0.020	0.005	0.246		
TG	Obesity	weighted_mode	0.048	0.080	1.049	0.897	1.227	0.550		
TG	Obesity	weighted_Median	0.026	0.082	1.027	0.875	1.205	0.748		
TG	Obesity	DIVW	-0.020	0.077	0.980	0.843	1.140	0.796		
TG	Obesity	MR-RAPS	-0.020	0.055	0.980	0.880	1.092	0.714		
TG	AAD	IVW_fix	0.484	0.193	1.623	1.112	2.368	0.012	30.913	0.874
TG	AAD	Egger_slope	0.181	0.327	1.198	0.631	2.275	0.581		
TG	AAD	Egger_intercept	0.016	0.014	0.016	-0.011	0.042	0.251		
TG	AAD	weighted_mode	0.343	0.282	1.409	0.812	2.447	0.223		
TG	AAD	weighted_Median	0.316	0.291	1.372	0.776	2.424	0.276		
TG	AAD	DIVW	0.488	0.194	1.629	1.113	2.385	0.012		

TG	AAD	MR-RAPS	0.487	0.195	1.628	1.111	2.384	0.012		
TG	TAA	IVW_fix	0.251	0.146	1.285	0.966	1.710	0.085	37.772	0.855
TG	TAA	Egger_slope	0.263	0.261	1.301	0.779	2.171	0.314		
TG	TAA	Egger_intercept	-0.001	0.012	-0.001	-0.024	0.023	0.957		
TG	TAA	weighted_mode	0.185	0.227	1.203	0.772	1.875	0.414		
TG	TAA	weighted_Median	0.213	0.209	1.237	0.822	1.863	0.308		
TG	TAA	DIVW	0.253	0.147	1.288	0.966	1.716	0.085		
TG	TAA	MR-RAPS	0.252	0.147	1.287	0.965	1.716	0.086		
TG	Gout	IVW_random	0.207	0.087	1.229	1.038	1.457	0.017	64.469	0.005
TG	Gout	Egger_slope	-0.157	0.214	0.854	0.554	1.318	0.466		
TG	Gout	Egger_intercept	0.014	0.007	0.014	-0.001	0.029	0.072		
TG	Gout	weighted_mode	0.019	0.129	1.020	0.792	1.313	0.881		
TG	Gout	weighted_Median	0.105	0.107	1.111	0.901	1.369	0.326		
TG	Gout	DIVW	0.209	0.086	1.232	1.040	1.460	0.016		
TG	Gout	MR-RAPS	0.211	0.067	1.235	1.082	1.408	0.002		
TG	Hypertension	IVW_fix	0.250	0.055	1.284	1.153	1.430	0.000	49.100	0.210
TG	Hypertension	Egger_slope	0.123	0.109	1.131	0.907	1.410	0.267		
TG	Hypertension	Egger_intercept	0.006	0.005	0.006	-0.003	0.016	0.175		
TG	Hypertension	weighted_mode	0.203	0.094	1.226	1.020	1.473	0.030		

TG	Hypertension	weighted_Median	0.206	0.087	1.229	1.037	1.456	0.018		
TG	Hypertension	DIVW	0.252	0.059	1.287	1.147	1.443	0.000		
TG	Hypertension	MR-RAPS	0.252	0.055	1.287	1.155	1.435	0.000		
TG	T2D	IVW_random	0.238	0.107	1.269	1.029	1.564	0.026	680.905	0.000
TG	T2D	Egger_slope	-0.200	0.173	0.819	0.577	1.161	0.254		
TG	T2D	Egger_intercept	0.023	0.007	0.023	0.008	0.038	0.004		
TG	T2D	weighted_mode	0.016	0.039	1.017	0.942	1.096	0.671		
TG	T2D	weighted_Median	0.035	0.047	1.035	0.944	1.136	0.462		
TG	T2D	DIVW	0.240	0.099	1.271	1.048	1.543	0.015		
TG	T2D	MR-RAPS	0.272	0.025	1.312	1.249	1.379	0.000		

AAD: Acute aortic dissection; IVW: debiased inverse-variance weighted; LDSC: linkage disequilibrium score regression; MR-RAPS: Mendelian randomization-robust adjusted profile score; TAA: thoracic aortic aneurysm; TG: triglyceride; T2D: type 2 diabetes.

Supplementary Table 8. Expression of pleiotropic genes in 54 GTEx tissues

[illegible]

[illegible]

[illegible]

0000115194	A	84	63	19	36	57	03	48	68	29	69	71	44	74	14	89	17	10	62	93	92	75	35	11	69	50	22	96	47	63	95	65	42	69	95	49	55	54	47	84	25	11	46	37	39	09	82	84	11	19
ENSG00000116373	D/JC5G	020381	031254	10251	03801	064254	04737	053037	0728143	0416259	0041521	0005621	1091552	1600541	040847	005084	026505	0018357	0090304	0746073	0014153	03740379	000401379	00221379	0014279	005427	000172	004343	00083	0000383	0015975	001197	000943563	00115975	00011263	0005663	000847	0000957	0004357	0000437	101334	0004373	0006834							

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Supplementary Table 9. The results of pathway analysis for pleiotropic genes

GO	Category	Description	Count	%	Log10(P)	Log10(q)
GO:0009749	GO Biological Processes	response to glucose	5	10.42	-5.41	-1.36
GO:0046982	GO Molecular Functions	protein heterodimerization activity	6	12.5	-4.71	-1.04
GO:0043523	GO Biological Processes	regulation of neuron apoptotic process	5	10.42	-4.38	-0.79
WP4396	WikiPathways	No/lcoholic fatty liver disease	4	8.33	-3.98	-0.51
GO:0007219	GO Biological Processes	Notch sig/ling pathway	3	6.25	-3.09	-0.05
GO:0042803	GO Molecular Functions	protein homodimerization activity	6	12.5	-3.05	-0.05
hsa04010	KEGG Pathway	MAPK sig/ling pathway	4	8.33	-2.89	0
GO:0001822	GO Biological Processes	kidney development	4	8.33	-2.87	0
GO:0007584	GO Biological Processes	response to nutrient	3	6.25	-2.71	0
GO:0009725	GO Biological Processes	response to hormone	5	10.42	-2.1	0
GO:0007346	GO Biological Processes	regulation of mitotic cell cycle	4	8.33	-2.03	0
GO:0010035	GO Biological Processes	response to inorganic substance	4	8.33	-2.02	0

GO: Gene Ontology; KEGG: Kyoto Encyclopedia of Genes and Genomes.