

## SUPPLEMENTARY TABLES

**Supplementary Table 7. MetaQTL effects of significant SNPs.**

SNP	Traits	Metabolics	Related disease or biofunctions(PMID)	Sample Type	P_value	Source
rs10774625	Pleiotropic	5-hydroxytryptophan	Depression(31071306)	serum	6.52E-06	SI data (Long et al.)
		hypoxanthine	Coronary artery disease (18651524)	serum	1.29E-06	SI data (Long et al.)
		quinolinate	Acute kidney injury (31055583)	serum	3.21E-06	SI data (Long et al.)
		C-glycosyltryptophan		serum	5.41E-05	SI data (Shin et al.)
		gamma-glutamylleucine		serum	6.14E-05	SI data (Shin et al.)
		kynurenine	Blood pressure (20190767)	serum	1.47E-16	SI data (Shin et al.)
		erythronate	Cirrhosis (29291380)	serum	5.78E-05	SI data (Shin et al.)
rs11066301	Pleiotropic	kynurenine	Blood pressure (20190767)	serum	2.93E-11	SI data (Shin et al.)
		erythronate	Cirrhosis (29291380)	serum	1.71E-05	SI data (Shin et al.)
rs11172113	Pleiotropic	SM C18:1	Coronary artery disease (28431006)	serum	9.21E-05	SI data (Draisma et al.)
rs630014	Pleiotropic	glycylglycine	Alzheimer's disease (28951883)	serum	6.26E-06	SI data (Long et al.)
		ADpSGEGDFXAEGGGVR	T2D (30372032)	serum	3.53E-09	SI data (Shin et al.)
		ADpSGEGDFXAEGGGVR	T2D (30372032)	serum	1.64E-06	SI data (Suhre et al.)
rs10791643	CAD	propylene glycol	Hyperketonemia (27638258)	urine	4.60E-05	SI data (Raffler et al.)
rs11066301	CAD	kynurenine	Blood pressure (20190767)	serum	2.93E-11	SI data (Shin et al.)
		erythronate	Cirrhosis (29291380)	serum	1.71E-05	SI data (Shin et al.)
rs11668477	CAD	cholesterol	Multiple metabolic disease (28319895)	serum	7.69E-05	SI data (Shin et al.)
rs1418278	CAD	X-14057		serum	2.98E-05	SI data (Shin et al.)
rs1541853	CAD	PC aa C32:2		serum	9.24E-05	SI data (Draisma et al.)
rs3811417	CAD	nonanoylcarnitine		serum	9.50E-05	SI data (Shin et al.)
rs3918291	CAD	1,7-dimethylurate		serum	5.41E-05	SI data (Suhre et al.)
rs405509	CAD	X-11820		serum	4.82E-11	SI data (Shin et al.)
rs4245791	CAD	X-12063		serum	3.07E-08	SI data (Shin et al.)
rs445925	CAD	palmitoyl-linoleoyl-glycerol		serum	2.11E-06	SI data (Long et al.)
		17beta-diol monosulfate		serum	2.07E-06	SI data (Long et al.)
		oleoyl-linoleoyl-glycerol		serum	7.34E-06	SI data (Long et al.)
		Tetradecenoylcarnitine	Ageing-related Diseases (30498825)	serum	3.00E-05	SI data (Draisma et al.)
		PC aa C28:1		serum	6.54E-06	SI data (Draisma et al.)
		palmitoyl sphingomyelin	Dyslipidemia (18299615)	serum	1.97E-09	SI data (Shin et al.)
		cholesterol	Multiple metabolic disease (28319895)	serum	4.10E-10	SI data (Shin et al.)
rs4895390	CAD	2-hydroxyacetaminophen sulfate	Children obesity (30253079)	serum	8.89E-05	SI data (Shin et al.)
rs624249	CAD	X-12798		serum	2.38E-11	SI data (Long et al.)
rs6922782	CAD	X-12411		serum	6.65E-06	SI data (Long et al.)
rs998584	CAD	SM C16:1		serum	2.76E-05	SI data (Draisma et al.)
rs10221235	BW	PC aa C38:6		serum	1.66E-05	SI data (Draisma et al.)
rs1042725	BW	serine	Multiple metabolic disease (28319895)	serum	7.98E-07	SI data (Shin et al.)
rs10786156	BW	cyclo(leu-pro)		serum	1.26E-05	SI data (Shin et al.)
rs10786706	BW	X-12212		serum	2.68E-05	SI data (Shin et al.)
rs11125079	BW	HWESASXX	Blood pressure (27129722)	serum	7.34E-05	SI data (Suhre et al.)
rs11187076	BW	pregnen-diol disulfate		serum	1.55E-07	SI data (Long et al.)
rs12371967	BW	malate		serum	2.47E-05	SI data (Shin et al.)
rs12656216	BW	lysine	birth weight (19067286)	serum	2.82E-05	SI data (Shin et al.)
rs1389923	BW	hydroxyphenylacetic acid monosulfate		serum	7.18E-06	SI data (Shin et al.)

rs16887484	BW	guanosine		serum	8.82E-07	SI data (Shin et al.)
		inosine		serum	4.51E-05	SI data (Shin et al.)
rs1797081	BW	X-12749		serum	5.74E-05	SI data (Shin et al.)
rs2087826	BW	cotinine		serum	3.39E-05	SI data (Shin et al.)
rs2497304	BW	21-hydroxypregnenolone disulfate		serum	3.37E-06	SI data (Long et al.)
		dehydroisoandrosterone sulfate		serum	8.55E-05	SI data (Shin et al.)
rs3198697	BW	1-dihomo-linolenoyl-GPC		serum	4.53E-06	SI data (Long et al.)
		dihomo-linolenate	Oxidative stress (24760997)	serum	1.56E-07	SI data (Shin et al.)
		1-eicosatrienoylglycerophosphocholine		serum	2.35E-05	SI data (Suhre et al.)
rs3849774	BW	1-(1-enyl-stearoyl)-2-docosahexaenoyl-GPE		serum	8.36E-06	SI data (Long et al.)
rs4428060	BW	ADpSGEGDFXAEGGGVR	T2D (30372032)	serum	5.56E-05	SI data (Shin et al.)
		ADpSGEGDFXAEGGGVR	T2D (30372032)	serum	6.92E-05	SI data (Suhre et al.)
rs4712542	BW	dehydroisoandrosterone sulfate		serum	4.09E-05	SI data (Shin et al.)
rs475931	BW	4-hydroxyhippurate		serum	1.82E-05	SI data (Shin et al.)
rs4812493	BW	ADSGEGDFXAEGGGVR	T2D (30372032)	serum	6.73E-05	SI data (Shin et al.)
rs4875812	BW	deoxycholate		serum	6.12E-05	SI data (Shin et al.)
rs533318	BW	tiglyl carnitine		serum	4.81E-05	SI data (Suhre et al.)
rs6948511	BW	X-11795		serum	3.30E-06	SI data (Shin et al.)
rs8108865	BW	HWESASXX	Blood pressure (27129722)	serum	7.05E-05	SI data (Suhre et al.)
rs889203	BW	3-methylxanthine		serum	9.95E-06	SI data (Suhre et al.)

**Supplementary Table 8. 9 pleiotropic SNPs also associated with other phenotypes.**

SNP	Chr	Pos	Alt	metaQTL/pQTL/meQTL/eQTL	ccFDR	Traits	PMID
rs10774625	12	111472415	A/T	metaQTL/pQTL/meQTL/eQTL(3 hits)	3.06E-05	Colorectal cancer	29547645
						Hashimoto's thyroiditis	27268232
						Systemic lupus	27906046
						Type 1 diabetes	24936253
						Hypertension	19430479
rs11066301	12	112433568	A/T	metaQTL/meQTL/eQTL(1 hit)	6.50E-03	Hematological parameters	19820697
rs11172113	12	57133500	T/A	metaQTL/meQTL/eQTL(4 hits)	3.18E-02	Headache	29397368
						Migraine	27322543
						Pulmonary function	21946350
rs3756668	5	68300260	G/C		1.32E-02	Type 2 diabetes	29893513
						Small cell lung cancer	28280736
						Endometrial cancer	22146979
rs630014	9	133274306	A/T	metaQTL/meQTL/eQTL(9 hits)	1.16E-02	Pancreatic ductal adenocarcinoma	23816557
						Venous thromboembolism	21463476
						Pancreatic cancer	22523087
rs670950	19	43777410	T/A	eQTL(1 hit)	3.15E-02	Vascular diseases	19644414
rs6713510	2	226169783	G/C		1.29E-02	Fasting plasma glucose	21188353
rs8039305	15	90879313	T/A	meQTL/eQTL(27 hits)	3.77E-06	Hypertension	28686695
rs821551	1	155718789	C/G	meQTL/eQTL(50 hits)	1.08E-02	Osteoporotic fractures	21760914

**Supplementary Table 9. Conjunction cFDR for 17 pleiotropic SNPs in CAD and BW in validation dataset (ccFDR  $\leq 0.05$ ).**

SNP	Chr	Pos	Alt	Gene	Annotation	cFDR.CAD	cFDR.BW	ccFDR	Validation
rs1042725	12	65964567	C/T	<i>HMG2</i>	3'-UTR	1.05E-02	7.21E-29	1.05E-02	No
rs10774625	12	111472415	A/T	<i>ATXN2</i>	intronic	5.16E-12	2.04E-05	2.04E-05	Yes
rs11066301	12	112433568	A/T	<i>PTPN11</i>	intronic	9.98E-05	9.88E-03	9.88E-03	Yes
rs11206803	1	56411837	C/G	<i>AC119674.2</i>	intronic	4.86E-03	4.44E-02	4.44E-02	Yes
rs11853441	15	90856978	T/G	<i>Metazoa_SRP</i>	intergenic	9.38E-03	5.99E-03	9.38E-03	No
rs12306172	12	54145221	G/C	<i>SMUG1</i>	intronic	2.20E-03	1.52E-04	2.20E-03	Yes
rs2243621	6	31464043	C/T	<i>HCP5</i>	3'-UTR	2.56E-02	4.50E-02	4.50E-02	No
rs2339940	2	24028917	G/C	<i>MFSD2B</i>	intronic	4.45E-02	1.16E-04	4.45E-02	Yes
rs4233701	2	23706216	G/C	<i>KLHL29</i>	intronic	4.50E-02	1.15E-04	4.50E-02	Yes
rs4704942	5	158466352	G/C	<i>RP11</i>	intergenic	4.95E-02	1.83E-05	4.95E-02	No
rs6016377	20	40544088	C/T	<i>SNORD112</i>	intergenic	2.95E-02	1.83E-07	2.95E-02	No
rs630014	9	133274306	A/T	<i>ABO</i>	intronic	2.05E-03	9.57E-03	9.57E-03	Yes
rs6673081	1	155017119	T/A	<i>ZBTB7B</i>	3'-UTR	3.73E-02	2.11E-07	3.73E-02	Yes
rs6713510	2	226169783	G/C	<i>LOC646736</i>	intronic	1.07E-02	1.63E-02	1.63E-02	Yes
rs8039305	15	90879313	T/A	<i>FURIN</i>	intronic	2.86E-11	3.92E-07	3.92E-07	Yes
rs866919	10	30224354	C/G	<i>RP11</i>	intergenic	3.92E-02	2.45E-02	3.92E-02	Yes
rs965098	21	15185306	G/C	<i>JCAD</i>	intergenic	4.84E-02	4.08E-02	4.84E-02	Yes

**Supplementary Table 10. 52 SNPs for genetic association from BW to CAD by mendelian randomization analysis.**

SNP	Gene	Alt	BW		CAD	
			<i>P</i>	$\beta$	<i>P</i>	$\beta$
rs1011939	<i>GPR139</i>	G/C	3.00E-09	2.36E-02	2.46E-01	-1.20E-02
rs10402712	<i>PEPD</i>	A/T	2.00E-08	2.29E-02	5.33E-03	-2.94E-02
rs10830963	<i>MTNR1B</i>	G/C	1.00E-07	2.20E-02	5.27E-02	2.04E-02
rs10935733	<i>CPA3</i>	T/A	6.00E-10	2.31E-02	8.81E-02	-1.64E-02
rs1101081	<i>ESR1</i>	C/G	6.00E-20	3.70E-02	1.45E-02	-2.61E-02
rs11055034	<i>APOLD1</i>	C/G	2.00E-08	2.30E-02	8.28E-01	-2.32E-03
rs113086489	<i>CLDN7</i>	T/A	1.00E-15	2.96E-02	3.59E-01	-8.98E-03
rs11765649	<i>IGF2BP3</i>	T/A	1.00E-09	2.58E-02	4.07E-01	-9.34E-03
rs12543725	<i>SLC45A4</i>	G/C	2.00E-09	2.23E-02	9.53E-03	-2.52E-02
rs12823128	<i>ITPR2</i>	T/A	3.00E-08	2.04E-02	2.13E-01	1.20E-02
rs12906125	<i>FES</i>	G/C	1.00E-08	2.26E-02	8.64E-08	-5.97E-02
rs12942207	<i>SP6</i>	C/G	3.00E-09	2.38E-02	9.52E-01	-6.04E-04
rs13266210	<i>ANK1</i>	A/T	2.00E-11	2.98E-02	6.57E-01	5.10E-03
rs13322435	<i>CCN1</i>	A/T	1.00E-42	5.24E-02	1.64E-01	-1.37E-02
rs134594	<i>KREMEN1</i>	C/G	2.00E-08	2.15E-02	3.07E-02	-2.07E-02
rs1351394	<i>HMGA2</i>	T/A	2.00E-33	4.30E-02	3.40E-02	-2.03E-02
rs1374204	<i>EPAS1</i>	T/A	2.00E-29	4.59E-02	3.98E-01	-8.52E-03
rs138715366	<i>YKT6</i>	C/G	1.00E-26	2.44E-01	1.29E-01	-9.68E-02
rs1415701	<i>L3MBTL3</i>	G/C	4.00E-11	2.70E-02	8.78E-02	-1.79E-02
rs144843919	<i>SUZ12P1</i>	G/C	2.00E-09	6.85E-02	6.89E-02	-7.51E-02
rs1819436	<i>RNF219</i>	C/G	2.00E-09	3.29E-02	3.60E-02	2.96E-02
rs2150052	<i>LPAR1</i>	T/A	3.00E-08	2.03E-02	1.75E-01	-1.25E-02
rs2229742	<i>NRIP1</i>	G/C	2.00E-08	3.37E-02	1.82E-02	-3.93E-02
rs2242116	<i>PTH1R</i>	A/T	1.00E-08	2.09E-02	2.21E-01	1.17E-02
rs2324499	<i>LINC00332</i>	G/C	8.00E-09	2.25E-02	8.94E-01	1.39E-03
rs2421016	<i>PLEKHA1</i>	T/A	6.00E-09	2.07E-02	1.27E-01	-1.41E-02
rs2473248	<i>WNT4</i>	C/G	1.00E-09	3.31E-02	9.76E-01	3.83E-04
rs28510415	<i>PTCH1</i>	G/C	4.00E-16	5.26E-02	1.06E-01	-2.74E-02
rs28530618	<i>C20orf203</i>	A/T	8.00E-11	2.40E-02	5.89E-01	5.16E-03
rs2854355	<i>RB1</i>	G/C	2.00E-08	2.40E-02	2.15E-01	1.33E-02
rs35261542	<i>CDKAL1</i>	C/G	1.00E-28	4.44E-02	3.05E-02	-2.21E-02
rs3753639	<i>ZBTB7B</i>	C/G	1.00E-12	3.10E-02	6.05E-03	-3.33E-02
rs6016377	<i>MAFB</i>	T/A	4.00E-10	2.39E-02	7.13E-03	-2.61E-02
rs6040076	<i>JAG1</i>	C/G	7.00E-09	2.18E-02	1.73E-01	1.32E-02
rs61154119	<i>ACTL9</i>	T/A	2.00E-08	2.83E-02	6.48E-01	6.01E-03
rs61830764	<i>DTL</i>	A/T	5.00E-08	2.18E-02	9.62E-01	5.36E-04
rs61862780	<i>HHEX</i>	T/A	1.00E-14	2.79E-02	7.55E-02	-1.69E-02
rs62240962	<i>SREBF2</i>	C/G	4.00E-12	4.70E-02	7.52E-01	-6.01E-03
rs62466330	<i>MLXIPL</i>	C/G	6.00E-12	5.12E-02	9.99E-02	-3.68E-02
rs6537307	<i>HHIP</i>	G/C	1.00E-12	2.59E-02	9.11E-01	-1.05E-03
rs6989280	<i>TRIB1</i>	G/C	5.00E-08	2.21E-02	5.61E-01	-5.95E-03
rs700059	<i>STRBP</i>	G/C	1.00E-12	3.61E-02	7.39E-01	4.23E-03
rs7076938	<i>ADRB1</i>	T/A	5.00E-18	3.49E-02	3.97E-01	8.89E-03
rs72480273	<i>FCGR2B</i>	C/G	2.00E-09	3.00E-02	2.36E-01	-1.70E-02
rs72851023	<i>INS</i>	T/A	7.00E-10	4.63E-02	4.75E-01	1.51E-02

rs7402982	<i>IGF1R</i>	A/T	1.00E-09	2.31E-02	5.19E-01	-6.29E-03
rs74233809	<i>NT5C2</i>	T/A	2.00E-09	-3.87E-02	4.09E-07	7.21E-02
rs7575873	<i>ATAD2B</i>	A/T	6.00E-11	3.62E-02	7.08E-03	-3.87E-02
rs7729301	<i>EBF1</i>	A/T	1.00E-09	2.46E-02	1.12E-02	-2.59E-02
rs7742369	<i>HMGA1</i>	G/C	1.00E-08	2.68E-02	7.87E-01	-3.53E-03
rs7964361	<i>IGF1</i>	A/T	1.00E-08	3.78E-02	2.12E-01	-2.08E-02
rs798489	<i>GNAI2</i>	C/G	5.00E-09	2.40E-02	9.54E-01	-6.78E-04
rs854037	<i>Intergenic</i>	A/T	3.00E-08	2.51E-02	6.33E-01	5.40E-03
rs925098	<i>LCORL</i>	G/C	1.00E-15	3.22E-02	1.01E-02	-2.72E-02

**Supplementary Table 11. Heterogeneity test assesses whether heterogeneity exists in SNPs.**

Method	<i>Q</i>	<i>Q</i> _df	<i>P</i> _value
Fixed effects meta-analysis (simple SE)	121.202	51	0.1804443
Random effects meta-analysis (delta method)	121.202	51	0.1804443
Maximum likelihood	120.8839	50	0.1289658
MR Egger	121.202	51	0.1143716
Inverse variance weighted	119.6123	51	0.1415539

**Supplementary Table 12. Causal association from CAD to BW by mendelian randomization analysis.**

Method	nSNP	$\beta$ (95%CI)	<i>P</i> _value
Simple median	39	-0.0002 (-0.0152, 0.0149)	0.98
Weighted median	39	-0.0002 (-0.0253, 0.0250)	0.99
Weighted mode	39	0.0163 (-0.0077, 0.0403)	0.19
Maximum likelihood	39	-0.0002 (-0.0155, 0.0152)	0.98
MR Egger	39	0.0162 (-0.0443, 0.0767)	0.60
Inverse variance weighted	39	-0.0002 (-0.0253, 0.0250)	0.99