

Supplementary Table S1 Single nucleotide polymorphisms included in the GRS and the reported traits by the genome-wide association (GWA) studies

SNP	Gene name	Gene Symbol	Chromosome Location	Location of SNP	Alleles Risk/Other	Traits	GWA Study
rs1558902	<i>Alpha-ketoglutarate dependent dioxygenase</i>	<i>FTO</i>	16:53769662	Intronic	A/T	HDL-C, BMI, HC, WC, HbA1c and obesity	Locke et al. (2015) (1) Ligthart et al. (2016) (2) Tachmazidou et al. (2017) (3) Wheeler et al. (2017) (4) Scherag et al. (2010) (5)

rs13021737	<i>Transmembrane protein 18</i>	<i>TMEM18</i>	2:632348	Intergenic	G/A	BMI	Locke et al. (2015) (1) Akiyama et al. (2017) (6) Hoffmann et al. (2018) (7) Justice et al. (2017) (8) Pulit et al. (2019) (9) Koskeridis et al. (2022) (10)
rs6567160	<i>Melanocortin 4 receptor</i>	<i>MC4R</i>	18:60161902	Upstream	C/T	HDL-C, TG, WHR, T2D, BMI	Locke et al. (2015) (1)

							<p>Pulit et al. (2019) (9)</p> <p>Vujkovic et al. (2020) (11)</p> <p>Martin et al. (2021) (12)</p> <p>Mahajan et al. (2018) (13)</p>
rs10938397	<i>Glucosamine-6-phosphate deaminase 2</i>	<i>GNPDA2</i>	4:45180510	Intergenic	G/A	<p>HDL-C, LDL-C, BMI, WC, obesity</p>	<p>Locke et al. (2015) (1)</p> <p>Martin et al. (2021) (12)</p> <p>Berndt et al. (2013) (14)</p> <p>Shungin et al. (2015) (15)</p>

rs543874	<i>SEC16 homolog B, endoplasmic reticulum export factor</i>	<i>SEC16B</i>	1:177920345	Upstream	G/A	HDL-C, BMI, HC, WHR	Locke et al. (2015) (1) Pulit et al. (2019) (9) Koskeridis et al. (2022) (10) Shungin et al. (2015) (15) Huang et al. (2022) (16)
rs7138803	<i>BCDIN3 domain containing RNA</i>	<i>BCDIN3D</i>	12:49853685	Intergenic	A/G	HDL-C, BMI, HC, WHR, obesity	Locke et al. (2015) (1) Pulit et al. (2019) (9) Koskeridis et al. (2022) (10)

							Berndt et al. (2013) (14) Shungin et al. (2015) (15)
rs2207139	<i>Transcription factor AP-2 beta</i>	<i>TFAP2B</i>	6:50877777	Intergenic	G/A	BMI	Locke et al. (2015) (1) Justice et al. (2017) (8) Koskeridis et al. (2022) (10) Berndt et al. (2013) (14)
rs3101336	<i>Neuronal growth regulator 1</i>	<i>NEGR1</i>	1:72285502	Intronic	C/T	BMI	Locke et al. (2015) (1) Akiyama et al. (2017) (6)

							Hoffmann et al. (2018) (7) Justice et al. (2017) (8) Pulit et al. (2019) (9)
rs10182181	<i>Adenylate cyclase 3</i>	<i>ADCY3</i>	2:24927427	Intergenic	G/A	BMI	Locke et al. (2015) (1) Akiyama et al. (2017) (6) Hoffmann et al. (2018) (7) Winker et al. (2015) (17)

rs1516725	<i>ETS variant transcription factor 5</i>	<i>ETV5</i>	3:186106215	Intronic	C/T	BMI	Locke et al. (1) Akiyama et al. (2017) (6) Berndt et al. (2013) (14) Graham et al. (2021) (18)
rs2287019	<i>Glutaminyl- peptide cyclotransferase like</i>	<i>QPCTL</i>	19:45698914	Intronic	C/T	LDL-C, TC, SBP, BMI, WC, WHR,	Locke et al. (2015) (1) Pulit et al. (2019) (9) Shungin et al. (2015) (15) Lee et al. (2022) (19)

rs12446632	<i>G protein-coupled receptor class C group 5 member B</i>	<i>GPRC5B</i>	16:19924067	Intergenic	G/A	BMI	Locke et al. (2015) (1) Hoffman et al. (2018) (7) Berndt et al. (2013) (14)
rs3817334	<i>Mitochondrial carrier 2</i>	<i>MTCH2</i>	11:47,607,569	Intronic	T/C	BMI	Akiyama et al. (2017) (6) Hoffman et al. (2018) (7) Huang et al. (2022) (16) Winker et al. (2015) (17) Speliotes et al. (2010) (20)

rs2112347	<i>POC5 centriolar protein</i>	<i>POC5</i>	5:75719417	Upstream	T/G	HDL-C, LDL-C, TG BMI, WC, HC, WHR, body fat percentage	Locke et al. (2015) (1) Pulit et al. (2019) (9) Martin et al. (2021) (12) Shungin et al. (2015) (15)
rs16951275	<i>Mitogen-activated protein kinase 5</i>	<i>MAP2K5</i>	15:67784830	Intronic	T/C	BMI	Locke et al. (2015) (1) Justice et al. (2017) (8) Wood et al. (2016) (21)

rs3810291	<i>zinc finger CCCH-type containing 4</i>	<i>ZC3H4</i>	19:47065746	3 prime UTR	A/G	HDL-C, TG, BMI, WC, T2D, HC	Locke et al. (2015) (1) Martin et al. (2021) (12) Mahajan et al. (2018) (13) Shungin et al. (2015) (15)
rs12566985	<i>FPGT-TNNI3K readthrough</i>	<i>FPGT-TNNI3K</i>	1:74536509	Intronic	G/A	BMI	Locke et al. (2015) (1) Felix et al. (2022) (22)
rs10968576	<i>Leucine rich repeat and Ig domain containing 2</i>	<i>LINGO2</i>	9:28414341	Intronic	G/A	HDL-C, BMI, WC	Locke et al. (2015) (1) Koskeridis et al. (2022) (10)

							Huang et al. (2022) (16) Liu et al. (2017) (23)
rs12286929	<i>Cell adhesion molecule 1</i>	<i>CADM1</i>	11:115151684	Intergenic	G/A	BMI	Locke et al. (2015) (1) Hoffman et al. (2018) (7) Pulit et al. (2019) (9)
rs12885454	<i>Protein kinase D1</i>	<i>PRKD1</i>	14:29267632	Exonic	C/A	BMI, WC	Locke et al. (2015) (1) Hoffman et al. (2018) (7) Shungin et al. (2015) (15)

							Huang et al. (2022) (16)
rs657452	<i>AGBL carboxypeptidase 4</i>	<i>AGBL4</i>	1:49124175	Intronic	A/G	BMI	Locke et al. (2015) (1) Hoffman et al. (2018) (7) Koskeridis et al. (2022) (10)
rs11165643	<i>Polypyrimidine tract binding protein 2</i>	<i>PTBP2</i>	1:96458541	Intergenic	T/C	BMI, body fat percentage	Locke et al. (2015) (1) Akiyama et al. (2017) (6) Koskeridis et al. (2022) (10) Martin et al. (2021) (12)

rs758747	<i>NLR family CARD domain containing 3</i>	<i>NLRC3</i>	16:3577357	5 prime UTR	T/C	BMI	Locke et al. (2015) (1) Hoffman et al. (2018) (7)
rs10132280	<i>Syntaxin binding protein 6</i>	<i>STXBP6</i>	14:25458973	Intergenic	C/T	BMI, WC, HC, WHR	Locke et al. (2015) (1) Pulit et al. (2019) (9) Shungin et al. (2015) (15) Graff et al. (2017) (24)
rs1167827	<i>Huntingtin interacting protein 1</i>	<i>HIP1</i>	7:75533848	3 prime UTR	G/A	BMI	Locke et al. (2015) (1) Huang et al. (2022) (16)

rs13078960	<i>Cell adhesion molecule 2</i>	<i>CADM2</i>	3:85758440	Intronic	G/T	BMI	Locke et al. (2015) (1)
rs12401738	<i>Far upstream element binding protein 1</i>	<i>FUBP1</i>	1:77981077	Intronic	A/G	BMI	Locke et al. (2015) (1) Winkler et al. 2015 (17)
rs12429545	<i>Olfactomedin 4</i>	<i>OLFM4</i>	13:53528071	Intronic	A/G	BMI, WC	Akiyama et al. (2017) (6) Justice et al. (2017) (8) Shungin et al. (2015) (15)
rs16851483	<i>RAS p21 protein activator 2</i>	<i>RASA2</i>	3:141556594	Intronic	T/G	BMI	Locke et al. (2015) (1)

							Pulit et al. (2019) (9)
rs17094222	<i>Hypoxia inducible factor 1 subunit alpha inhibitor</i>	<i>HIF1AN</i>	10:100635683	Intergenic	C/T	BMI	Locke et al. (2015) (1) Huang et al. (2022) (16)
rs17405819	<i>Hepatocyte nuclear factor 4 gamma</i>	<i>HNF4G</i>	8:75894349	Intergenic	T/C	BMI	Hoffman et al. (2018) (7) Pulit et al. (2019) (9) Graff et al. (2017) (24)
rs1928295	<i>Toll like receptor 4</i>	<i>TLR4</i>	9:117616205	Intergenic	T/C	BMI	Locke et al. (2015) (1) Koskeridis et al. (2022) (10)

rs7141420	<i>Neurexin 3</i>	<i>NRXN3</i>	14:79433111	Intronic	T/C	BMI, obesity	Locke et al. (2015) (1) Berndt et al. (2013) (14)
rs205262	<i>Inflammation and lipid regulator with UBA-like and NBR1-like domains</i>	<i>C6orf106</i>	6:34595387	Intronic	G/A	BMI	Locke et al. (2015) (1)
rs2365389	<i>Fragile histidine triad diadenosine triphosphatase</i>	<i>FHIT</i>	3:61250788	Intronic	C/T	BMI	Locke et al. (2015) (1) Huang et al. (2022) (16)
rs2820292	<i>Neuron navigator 1</i>	<i>NAV1</i>	1:201815159	Intronic	C/A	BMI	Locke et al. (2015) (1)

rs4256980	<i>Tripartite motif containing 66</i>	<i>TRIM66</i>	11:8652392	Intronic	G/C	BMI	Locke et al. (2015) (1) Pulit et al. (2019) (9)
rs7599312	<i>Erb-b2 receptor tyrosine kinase 4</i>	<i>ERBB4</i>	2:212548507	Regulatory region	G/A	BMI	Locke et al. (2015) (1) Tachmazidou et al. (2017) (3)
rs9925964	<i>Lysine acetyltransferase 8</i>	<i>KAT8</i>	16:31118574	Splice region	A/G	BMI	Locke et al. (2015) (1) Hoffman et al. (2018) (7)

References

1. Locke AE, Kahali B, Berndt SI, Justice AE, Pers TH, Day FR, et al. Genetic studies of body mass index yield new insights for obesity biology. *Nature*. 2015;518(7538):197-206.
2. Ligthart S, Vaez A, Hsu YH, Stolck R, Uitterlinden AG, Hofman A, et al. Bivariate genome-wide association study identifies novel pleiotropic loci for lipids and inflammation. *BMC Genomics*. 2016;17:443.
3. Tachmazidou I, Süveges D, Min JL, Ritchie GRS, Steinberg J, Walter K, et al. Whole-Genome Sequencing Coupled to Imputation Discovers Genetic Signals for Anthropometric Traits. *Am J Hum Genet*. 2017;100(6):865-84.
4. Wheeler E, Leong A, Liu CT, Hivert MF, Strawbridge RJ, Podmore C, et al. Impact of common genetic determinants of Hemoglobin A1c on type 2 diabetes risk and diagnosis in ancestrally diverse populations: A transethnic genome-wide meta-analysis. *PLoS Med*. 2017;14(9):e1002383.
5. Scherag A, Dina C, Hinney A, Vatin V, Scherag S, Vogel CI, et al. Two new Loci for body-weight regulation identified in a joint analysis of genome-wide association studies for early-onset extreme obesity in French and German study groups. *PLoS Genet*. 2010;6(4):e1000916.
6. Akiyama M, Okada Y, Kanai M, Takahashi A, Momozawa Y, Ikeda M, et al. Genome-wide association study identifies 112 new loci for body mass index in the Japanese population. *Nat Genet*. 2017;49(10):1458-67.
7. Hoffmann TJ, Choquet H, Yin J, Banda Y, Kvale MN, Glymour M, et al. A Large Multiethnic Genome-Wide Association Study of Adult Body Mass Index Identifies Novel Loci. *Genetics*. 2018;210(2):499-515.

8. Justice AE, Winkler TW, Feitosa MF, Graff M, Fisher VA, Young K, et al. Genome-wide meta-analysis of 241,258 adults accounting for smoking behaviour identifies novel loci for obesity traits. *Nat Commun.* 2017;8:14977.
9. Pulit SL, Stoneman C, Morris AP, Wood AR, Glastonbury CA, Tyrrell J, et al. Meta-analysis of genome-wide association studies for body fat distribution in 694 649 individuals of European ancestry. *Hum Mol Genet.* 2019;28(1):166-74.
10. Koskeridis F, Evangelou E, Said S, Boyle JJ, Elliott P, Dehghan A, et al. Pleiotropic genetic architecture and novel loci for C-reactive protein levels. *Nature Communications.* 2022;13(1):6939.
11. Vujkovic M, Keaton JM, Lynch JA, Miller DR, Zhou J, Tcheandjieu C, et al. Discovery of 318 new risk loci for type 2 diabetes and related vascular outcomes among 1.4 million participants in a multi-ancestry meta-analysis. *Nat Genet.* 2020;52(7):680-91.
12. Martin S, Cule M, Basty N, Tyrrell J, Beaumont RN, Wood AR, et al. Genetic Evidence for Different Adiposity Phenotypes and Their Opposing Influences on Ectopic Fat and Risk of Cardiometabolic Disease. *Diabetes.* 2021;70(8):1843-56.
13. Mahajan A, Taliun D, Thurner M, Robertson NR, Torres JM, Rayner NW, et al. Fine-mapping type 2 diabetes loci to single-variant resolution using high-density imputation and islet-specific epigenome maps. *Nat Genet.* 2018;50(11):1505-13.
14. Berndt SI, Gustafsson S, Mägi R, Ganna A, Wheeler E, Feitosa MF, et al. Genome-wide meta-analysis identifies 11 new loci for anthropometric traits and provides insights into genetic architecture. *Nature Genetics.* 2013;45(5):501-12.
15. Shungin D, Winkler TW, Croteau-Chonka DC, Ferreira T, Locke AE, Mägi R, et al. New genetic loci link adipose and insulin biology to body fat distribution. *Nature.* 2015;518(7538):187-96.

16. Huang J, Huffman JE, Huang Y, Do Valle Í, Assimes TL, Raghavan S, et al. Genomics and phenomics of body mass index reveals a complex disease network. *Nat Commun.* 2022;13(1):7973.
17. Winkler TW, Justice AE, Graff M, Barata L, Feitosa MF, Chu S, et al. The Influence of Age and Sex on Genetic Associations with Adult Body Size and Shape: A Large-Scale Genome-Wide Interaction Study. *PLoS Genet.* 2015;11(10):e1005378.
18. Graham SE, Clarke SL, Wu KH, Kanoni S, Zajac GJM, Ramdas S, et al. The power of genetic diversity in genome-wide association studies of lipids. *Nature.* 2021;600(7890):675-9.
19. Lee SB, Choi JE, Park B, Cha MY, Hong KW, Jung DH. Dyslipidaemia-Genotype Interactions with Nutrient Intake and Cerebro-Cardiovascular Disease. *Biomedicines.* 2022;10(7).
20. Speliotes EK, Willer CJ, Berndt SI, Monda KL, Thorleifsson G, Jackson AU, et al. Association analyses of 249,796 individuals reveal 18 new loci associated with body mass index. *Nat Genet.* 2010;42(11):937-48.
21. Wood AR, Tyrrell J, Beaumont R, Jones SE, Tuke MA, Ruth KS, et al. Variants in the FTO and CDKAL1 loci have recessive effects on risk of obesity and type 2 diabetes, respectively. *Diabetologia.* 2016;59(6):1214-21.
22. Felix JF, Bradfield JP, Monnereau C, van der Valk RJ, Stergiakouli E, Chesi A, et al. Genome-wide association analysis identifies three new susceptibility loci for childhood body mass index. *Hum Mol Genet.* 2016;25(2):389-403.
23. Liu DJ, Peloso GM, Yu H, Butterworth AS, Wang X, Mahajan A, et al. Exome-wide association study of plasma lipids in >300,000 individuals. *Nat Genet.* 2017;49(12):1758-66.

24. Graff M, Scott RA, Justice AE, Young KL, Feitosa MF, Barata L, et al.
Genome-wide physical activity interactions in adiposity - A meta-analysis of 200,452
adults. PLoS Genet. 2017;13(4):e1006528.