**Supplementary table 6. Gene function and associated phenotypes in GWAS catalog**

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| **Gene Name** | **Gene Function** | **Associated Phenotypes** | **Phenotypes linked to lifestyle and cardiometabolic factors.** |
| **Top genes identified in our GWAS** | | | |
| *NLRC5* | This gene plays a role in cytokine response and antiviral immunity through its inhibition of NF-kappa-B activation and negative regulation of type I interferon signaling pathways. | * High density lipoprotein cholesterol measurement, sleep duration * High density lipoprotein cholesterol measurement * Lymphocyte count * Eosinophil count * Monocyte count * Neutrophil count * Lymphocyte percentage of leukocytes * Myeloid white cell count * Leukocyte count * Total cholesterol measurement * Schizophrenia, bipolar disorder * Multiple sclerosis * Eosinophil percentage of leukocytes | * High density lipoprotein cholesterol measurement * Leukocyte count |
| *IMPAD1* | Adenosine monophosphate deaminase 1 catalyzes the deamination of AMP to IMP in skeletal muscle and plays an important role in the purine nucleotide cycle. | * Hip circumference adjusted for BMI. * Hepatocyte growth factor levels * Response to selective serotonin reuptake inhibitors and depression * Alcohol dependence | * Hepatocyte growth factor levels * Alcohol dependence * Hip circumference adjusted for BMI. |
| *CPLX2* | This gene encodes complexin/synaphin gene family are cytosolic proteins that function in synaptic vesicle exocytosis. These proteins bind syntaxin, part of the SNAP receptor. The protein product of this gene binds to the SNAP receptor complex and disrupts it, allowing transmitter release. | * Age-related nuclear cataracts * Facial morphology * Obesity-related traits * Attention deficit hyperactivity disorder (inattention symptoms) | * Obesity-related traits |
| *EIF4E3* | This gene belongs to the EIF4E family of translational initiation factors that interact with the 5-prime cap structure of mRNA and recruit mRNA to the ribosome. Among its related pathways are Interferon gamma signaling and Innate Immune System. | * Mosaic loss of chromosome Y * Monocyte percentage of white cells * Granulocyte percentage of myeloid white cells * Apolipoprotein A1 levels * Monocyte count * Type 2 diabetes * Eosinophil counts | * Apolipoprotein A1 levels * Type 2 diabetes * Monocyte percentage of white cells |
| *TBL1XR1* | This gene is a member of the WD40 repeat-containing gene family and shares sequence similarity with transducing (beta)-like 1X-linked (TBL1X). The protein encoded by this gene is thought to be a component of both nuclear receptor corepressor (N-CoR) and histone deacetylase 3 (HDAC 3) complexes, and is required for transcriptional activation by a variety of transcription factors | * Asthma * Mean corpuscular volume, Mean spheric corpuscular volume * Red cell distribution width * Asthma (childhood onset) * Asthma (adult onset) * Self-reported math ability, * Mean corpuscular hemoglobin * Atopic asthma * C-reactive protein levels * Medication use (adrenergics, inhalants) * Body mass index * Pulse pressure * Adult onset asthma and/or BMI * Mean reticulocyte volume * Respiratory diseases * Mental composite score | * C-reactive protein levels * Body mass index * Pulse pressure |
| *BLK* | This gene encodes a nonreceptor tyrosine-kinase of the src family of proto-oncogenes that are typically involved in cell proliferation and differentiation. The protein has a role in B-cell receptor signaling and B-cell development. The protein also stimulates insulin synthesis and secretion in response to glucose and enhances the expression of several pancreatic beta-cell transcription factors. | * Systemic lupus erythematosus * Rheumatoid arthritis, * Neuroticism * Systemic sclerosis * Kawasaki disease * Heel bone mineral density * Estimated glomerular filtration rate. * Phosphatidylcholine levels * Morning vs. Evening chronotype * Systemic lupus erythematosus and Systemic sclerosis * Systemic lupus erythematosus or rheumatoid arthritis * Number of sexual partners * General risk tolerance (MTAG) * Immune response to (IL-6) * Neurofibrillary tangles * Sjogren’s syndrome * Age at first sexual intercourse * Systemic seropositive rheumatic diseases | * Phosphatidylcholine levels * Immune response to (IL-6) |
| *SKI* | This gene encodes the nuclear protooncogene protein homolog of avian sarcoma viral (v-ski) oncogene. It functions as a repressor of TGF-beta signaling, and may play a role in neural tube development and muscle differentiation | * Reported trait(s) * Platelet count * Platelet distribution width * Coronary artery disease * Red cell distribution width * Igg glycosylation. * Educational attainment (years of education) * Height * Low density lipoprotein cholesterol levels * Sedentary behaviour duration * Systolic blood pressure * PR interval * Plateletcrit * Lung function (FVC) * Urate levels | * Coronary artery disease * Low density lipoprotein cholesterol levels * Sedentary behaviour duration * Systolic blood pressure * Urate levels |
| *MEF2D* | This gene is a member of the myocyte-specific enhancer factor 2 (MEF2) family of transcription factors. Members of this family are involved in control of muscle and neuronal cell differentiation and development and are regulated by class II histone deacetylases. | * Reported trait(s) * Electrocardiogram morphology * Migraine, Migraine - clinic-based * Platelet count * TPE interval (resting) * Body mass index * Plateletcrit * Waist circumference adjusted for body mass index. * Resting heart rate * Headache * Migraine and/or diastolic blood pressure * Migraine and/or systolic blood pressure * Migraine without aura and/or diastolic blood pressure * Migraine without aura and/or systolic blood pressure * Height * Waist-to-hip ratio adjusted for BMI. * Monocyte count * Medication use (antimigraine preparations) * White blood cell count | * Body mass index * Waist circumference adjusted for body mass index. * Resting heart rate * Systolic blood pressure * Diastolic blood pressure * Waist-to-hip ratio adjusted for BMI. * White blood cell count |
| *TLX3* | The protein encoded by this gene is an orphan homeobox protein that encodes a DNA-binding nuclear transcription factor | * Acute myeloid leukemia * Family history of lung cancer, squamous cell lung carcinoma * Comparative body size at age 10, self-reported | * None |
| *ST8SIA1* | The protein encoded by this gene is a type II membrane protein that catalyzes the transfer of sialic acid from CMP-sialic acid to GM3 to produce gangliosides GD3 and GT3.Gangliosides are membrane-bound glycosphingolipids containing sialic acid. Ganglioside GD3 is known to be important for cell adhesion and growth of cultured malignant cells. | * Post bronchodilator FEV1/FVC ratio * Non-alcoholic fatty liver disease histology (lobular) * Refractive error * Smoking initiation (ever regular vs never regular) (MTAG) * Height * Coronary artery calcification | * Non-alcoholic fatty liver disease histology (lobular) * Smoking initiation * Coronary artery calcification |
| *ANG* | The protein encoded by this gene is an exceedingly potent mediator of new blood vessel formation. It hydrolyzes cellular tRNAs resulting in decreased protein synthesis and is like pancreatic ribonuclease. | * Blood protein measurement * Angiogenin measurement * Malignant epithelial tumor of ovary, response to paclitaxel * Protein measurement | * Angiogenin measurement |
| *CHRM3* | This gene encodes muscarinic receptors. The muscarinic cholinergic receptors belong to a larger family of G protein-coupled receptors. The functional diversity of these receptors is defined by the binding of acetylcholine and includes cellular responses such as adenylate cyclase inhibition, phosphoinositide degeneration, and potassium channel mediation. Muscarinic receptors influence many effects of acetylcholine in the central and peripheral nervous system. | * Post bronchodilator FEV1 * Lung function (FEV1/FVC) * White matter hyperintensity burden * Hallucinations in long-term cannabis use * Platelet count * Obesity-related traits * Time-dependent creatinine clearance change response to tenofovir treatment in HIV infection (time and treatment arm interaction) * Neuritic plaque * Feeling worried * Peak expiratory flow * FEV1 * Gut microbiota beta diversity (weighted unifrac distance) * Depression in smokers * Chronic obstructive pulmonary disease * Hypertension * Aggressiveness in attention deficit hyperactivity disorder * Venous thromboembolism (SNP x SNP interaction) * Interleukin-6 (red blood cell fatty acid level interaction) * Generalized epilepsy. * Electroencephalogram traits * Vascular endothelial growth factor levels * Sulfasalazine-induced agranulocytosis * Diffuse plaques (SNP x SNP interaction) * Neurofibrillary tangles (SNP x SNP interaction) * Reflection (response to stress) * Aspartate aminotransferase levels in low alcohol consumption | * Obesity-related traits * Hypertension * Venous thromboembolism (SNP x SNP interaction) * Interleukin-6 (red blood cell fatty acid level interaction) * Aspartate aminotransferase levels in low alcohol consumption * Gut microbiota beta diversity |
| *HOXD1* | This gene is a member of the Antp homeobox family and encodes a protein with a homeobox DNA-binding domain. This nuclear protein functions as a sequence-specific transcription factor that is involved in differentiation and limb development | * Estimated glomerular filtration rate 1. * Glucose-dependent insulinotropic peptide measurement | * Glucose-dependent insulinotropic peptide measurement |
| *TRIOBP* | his gene encodes a protein with an N-terminal pleckstrin homology domain and a C-terminal coiled-coil region. The protein interacts with trio, which is involved with neural tissue development and controlling actin cytoskeleton organization, cell motility and cell growth. The protein also associates with F-actin and stabilizes F-actin structures. | * Intraocular pressure * Age-related hearing impairment, * Sex hormone-binding globulin levels adjusted for BMI, Sex hormone-binding globulin levels. * Optic cup area * Intelligence, General cognitive ability * Basophil count * Brain region volumes * Self-reported math ability (MTAG), Highest math class taken (MTAG) * Cognitive performance (MTAG), Cognitive performance * Vertical cup-disc ratio (adjusted for vertical disc diameter), Vertical cup-disc ratio (multi-trait analysis) * Total cholesterol changes in response to fenofibrate in statin-treated type 2 diabetes * Cognitive aspects of educational attainment * Systolic blood pressure * Mean corpuscular volume. * Pulse pressure * Vertical cup-disc ratio * Hip bone size * Bone mineral density (hip) and hip bone size * Brain morphology (mostest) * Height * Glaucoma * Red blood cell count * Mean corpuscular hemoglobin. * Lateral ventricular volume in normal aging | * Sex hormone-binding globulin levels * Total cholesterol changes in response to fenofibrate in statin-treated type 2 diabetes * Systolic blood pressure * Pulse pressure |
| VIPR2 | This gene encodes a receptor for vasoactive intestinal peptide, a small neuropeptide. Vasoactive intestinal peptide is involved in smooth muscle relaxation, exocrine and endocrine secretion, and water and ion flux in lung and intestinal epithelia. | * Spherical equivalent * Diastolic blood pressure * Quantitative lifestyle risk score interaction * Myopia (pathological) * Spherical equivalent or myopia (age of diagnosis) * Corneal astigmatism * Sub-foveal choroidal thickness * Gut microbiota (bacterial taxa, rank normal transformation method) * Refractive error * Neuritic plaques (SNP x SNP interaction) | * Diastolic blood pressure * Quantitative lifestyle risk score interaction * Gut microbiota |