

Table S1. Sample characteristics by phenotyping site (NYU vs CMI).

Variable	NYU	CMI	Statistics			
	n=81	n=85	df	W χ^2	p value	FDR-p value
Primary diagnosis, # (%)			1	0.01	0.94	0.94
ASD	30 (37)	33 (39)				
ADHD _{w/o ASD}	51 (63)	52 (61)				
Age, years, M (SD)	8.8 (1.8)	8.9 (1.7)	-	3575.00	0.67	0.86
Sex assigned at birth, males #, (%)	62 (77)	63 (74)	1	0.03	0.86	0.97
Ethnicity, Hispanic #, (%)^a	20 (25)	19 (23)	1	0.02	0.90	0.97
Race, #, (%)^{a,b}			4	6.40	0.17	0.58
White	51 (63)	44 (52)				
Mixed	15 (19)	11 (13)				
Black/African American	8 (10)	11 (13)				
Asian	4 (5)	10 (12)				
Other	3 (4)	8 (10)				
Socio-economic status, class #, (%)^c			1	0.00	0.99	0.99
Classes 1-3	21 (27)	24 (29)				
Classes 4-5	56 (73)	60 (71)				
Psychoactive Medication Status, #, (%)^d			2	1.59	0.45	0.80
Med naïve	56 (71)	61 (72)				
Currently on medication	19 (24)	16 (19)				
Not Naïve but current off treatment	4 (5)	8 (9)				
Psychiatric Comorbidity (yes) #, (%)	46 (57)	62 (73)	1	4.08	0.04	0.31
DAS-II IQ Standard scores, M (SD)						
Verbal IQ	105.3 (15.7)	108.5 (16.6)	-	3834.50	0.21	0.58
Non-verbal IQ	100.9 (18.9)	106.2 (16.8)	-	4045.00	0.05	0.31
Full-scale IQ	102.7 (16.1)	106.2 (17.1)	-	3819.50	0.22	0.58
ADOS-2, M (SD)						
Expressive Language ^a	7.9 (0.3)	7.9 (0.5)	-	3604.50	0.33	0.75
Social affect CSS	5.4 (2.4)	4.9 (2.7)	-	2993.50	0.14	0.58
RRB CSS	4 (2.9)	5.2 (3.4)	-	4196.50	0.01	0.26
Total CSS	4.8 (2.6)	4.6 (2.8)	-	3260.00	0.55	0.80
K-SADS ADHD severity, M (SD)						
Inattentive	6.7 (2.4)	6.9 (2)	-	3408.00	0.91	0.97
Hyperactive	5.5 (2.6)	5.8 (2.3)	-	3244.50	0.52	0.80
Total	12.2 (4)	12.7 (3.5)	-	3253.50	0.54	0.80
In-scanner motion, median FD, M (SD)	0.1 (0)	0.1 (0)	-	3697.50	0.41	0.80

Over the course of the study, the enrolling and phenotyping site transferred from the NYU Grossman School of Medicine Child Study Center to the Child Mind Institute (CMI) where the principal investigator (ADM) acquired a new position. Wilcoxon Rank sum tests were used to calculate between site differences for the continuous variables and Pearson Chi-square tests for categorical variables. All the obtained p-values were corrected using False Discovery Rate (FDR) at $q > 0.05$. **a.** Missing for one child enrolled at the site; **b.** "Other" includes American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, mixed race or other not specified. Of the n=3 children from NYU under "Other", 1 identified as American Indian/Alaskan Native, and 2 as 'other.' Of the 13 children with ADHD under other, 1 identified as Native Hawaiian/other Pacific Islander, 7 as 'other'; **c.** The group enrolled at the New York University (NYU) site included: n=4 children in the socioeconomic class (SES) Class 1, n=6 in SES Class 2, n=11 in SES Class 3, n=16 in SES Class 4, and n=40 in SES Class 5. The CMI group included n=5 children in SES Class 1, n=6 children in SES Class 2, n=13 in SES Class 3, n=21 in SES Class 4 and n=39 in SES Class 5. Missing data for n=4 children from NYU and n=1 from CMI sites; **d.** Information on medication status was not available for n=2 children from the NYU site; **e.** Autism Diagnostic Observation Schedule second edition (ADOS-2) based measure of expressive language validated in Mazurek et al. 2019, it ranges from 1 to 8 ("1" corresponds to "No spontaneous words or word approximations" and "8" to "Uses sentences in a largely correct fashion (must use some complex speech)"). **Abbreviations:** ASD, Autism Spectrum Disorder; ADHD_{w/o ASD}, Attention Deficit Hyperactivity Disorder without ASD; DAS-II, Differential Ability Scale-2nd Edition; CSS, calibrated severity scores; K-SADS; Kiddie Schedule for Affective Disorders and Schizophrenia; df, degrees of freedom; W χ^2 , Wilcoxon /chi-square statistic.

Variable	Included	Excluded after MRI QA	Statistics			
	n=166	n=28	df	W χ^2	p value	FDR-p value
Primary diagnosis, # (%)			1	1.10	0.29	0.63
ASD	63 (38)	14 (50)				
ADHD _{w/o} ASD	103 (62)	14 (50)				
Age, years, M (SD)	8.9 (1.7)	8.7 (2.0)	-	2380.5	0.84	0.95
Sex assigned at birth, males #, (%)	125 (75)	22 (81)	2	0.61	0.74	0.95
Ethnicity, Hispanic #, (%)^a	39 (24)	10 (37)	1	1.54	0.21	0.63
Race, #, (%)^{a,b}			4	4.60	0.33	0.63
White	95 (58)	14 (52)				
Mixed	26 (16)	5 (19)				
Black/African American	19 (12)	6 (22)				
Asian	14 (8)	0 (0)				
Other	11 (7)	2 (7)				
Socio-economic status, class #, (%)^c			1	0.00	1.00	1.00
Classes 1-3	45 (28)	6 (27)				
Classes 4-5	116 (72)	16 (73)				
DAS-II IQ Standard scores, M (SD)						
Verbal IQ	107 (16)	102 (13)	-	2800.50	0.04	0.63
Non-verbal IQ	104 (18)	102 (17)	-	2298.00	0.83	0.95
Full-scale IQ	105 (17)	101 (14)	-	2439.50	0.46	0.79
ADOS-2, M (SD)						
Expressive Language ^d	7.9 (0.4)	7.8 (0.4)	-	2558.00	0.14	0.63
Social affect CSS	5.1 (2.6)	5.8 (2.6)	-	1874.50	0.14	0.63
RRB CSS	4.6 (3.2)	5.2 (3.0)	-	2015.00	0.33	0.63
Total CSS	4.7 (2.7)	5.4 (2.6)	-	1884.50	0.15	0.63
K-SADS ADHD severity, M (SD)						
Inattentive	6.8 (2.2)	7.1 (1.8)	-	2009.00	0.97	1.00
Hyperactive	5.6 (2.4)	5.5 (2.8)	-	1943.00	0.78	0.95
Total	12.4 (3.8)	11.3 (5.1)	-	2479	0.574	0.886

Wilcoxon Rank sum tests were used to calculate between group differences for the continuous variables and Pearson Chi-square tests for categorical variables. p-values were corrected using False Discovery Rate (FDR) at $q > 0.05$, p values significant after correction are shown in bold in the FDR p-value column. **a.** Missing from n=1 child from the included group, and n=1 from the excluded group; **b.** “Other” includes American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, mixed race or other not specified. Of the n=11 children from the included group under “Other”, 1 identified as American Indian/Alaskan Native, 1 identified as Native Hawaiian/other Pacific Islander, and 9 as ‘other’. Of the n=2 children from the excluded group under “Other”, identified as ‘other’; **c.** The included group included: n=9 children in socioeconomic class (SES) Class 1, n=12 in SES Class 2, n=24 in SES Class 3, n=37 in SES Class 4, and n=79 in SES Class 5. The excluded group included n=3 children in SES Class 2, n=3 in SES Class 3, n=7 in SES Class 4 and n=9 SES Class 5. Missing data for n=5 children from the included group and n=6 from the excluded one; **d.** Autism Diagnostic Observation Schedule second edition (ADOS-2) based measure of expressive language validated in Mazurek et al. 2019, it ranges from 1 to 8 (“1” corresponds to “No spontaneous words or word approximations” and “8” to “Uses sentences in a largely correct fashion (must use some complex speech)”. **Abbreviations:** ASD, Autism Spectrum Disorder; ADHDw/oASD, Attention Deficit Hyperactivity Disorder without ASD; DAS-II, Differential Ability Scales-2nd Edition; CSS, calibrated severity scores; K-SADS; Kiddie Schedule for Affective Disorders and Schizophrenia; df, degrees of freedom; W χ^2 , Wilcoxon /chi-square statistic

Table S4. Curated list of $n=1,046$ genes tested for genetic enrichment in the present study.

Gene symbol	Gene name
AAK1	AP2 associated kinase 1
ABCD3	ATP-binding cassette, sub-family D (ALD), member 3
ABCF2	ATP-binding cassette, sub-family F (GCN20), member 2
ABHD16A	Abhydrolase Domain Containing 16A, Phospholipase
ABLM1	actin binding LIM protein 1
ABR	active BCR-related
ACACA	acetyl-CoA carboxylase alpha
ACLY	ATP citrate lyase
ACTN1	actinin, alpha 1
ACTN2	actinin, alpha 2
ADAD1	adenosine deaminase domain containing 1 (testis-specific)
ADAM10	ADAM metalloproteinase domain 10
ADAM17	ADAM metalloproteinase domain 17
ADCY1	adenylate cyclase 1 (brain)
ADCY9	adenylate cyclase 9
AFF3	AF4/FMR2 family, member 3
AGAP1	ArfGAP with GTPase domain, ankyrin repeat and PH domain 1
AGO2	Argonaute RISC Catalytic Component 2
AGO3	Argonaute RISC Catalytic Component 3
AGO4	Argonaute RISC Catalytic Component 4
AHCYL2	adenosylhomocysteinase-like 2
AHR	aryl hydrocarbon receptor
AKT2	v-akt murine thymoma viral oncogene homolog 2
ALDH1A1	aldehyde dehydrogenase 1 family, member A1
ANAPC7	anaphase promoting complex subunit 7
ANK1	ankyrin 1, erythrocytic
ANK2	ankyrin 2, neuronal
ANK3	ankyrin 3, node of Ranvier (ankyrin G)
ANKFY1	ankyrin repeat and FYVE domain containing 1
ANKRD11	ankyrin repeat domain 11

ANKRD12	ankyrin repeat domain 12
ANKRD34A	ankyrin repeat domain 34A
ANKS1B	ankyrin repeat and sterile alpha motif domain containing 1B
ANO8	anoctamin 8
AP2B1	adaptor-related protein complex 2, beta 1 subunit
AP2M1	adaptor-related protein complex 2, mu 1 subunit
AP2S1	adaptor-related protein complex 2, sigma 1 subunit
AP3B1	adaptor-related protein complex 3, beta 1 subunit
AP3B2	adaptor-related protein complex 3, beta 2 subunit
AP4E1	adaptor-related protein complex 4, epsilon 1 subunit
APBB1	amyloid beta (A4) precursor protein-binding, family B, member 1 (Fe65)
APPBP2	amyloid beta precursor protein (cytoplasmic tail) binding protein 2
AQR	aquarius homolog (mouse)
ARAP3	ArfGAP with RhoGAP domain, ankyrin repeat and PH domain 3
ARFGEF1	ADP-ribosylation factor guanine nucleotide-exchange factor 1 (brefeldin A-inhibited)
ARFGEF2	ADP-ribosylation factor guanine nucleotide-exchange factor 2 (brefeldin A-inhibited)
ARFIP2	ADP-ribosylation factor interacting protein 2
ARHGAP26	Rho GTPase activating protein 26
ARHGAP32	Rho GTPase Activating Protein 32
ARHGAP5	Rho GTPase activating protein 5
ARHGEF1	Rho guanine nucleotide exchange factor (GEF) 1
ARHGEF17	Rho guanine nucleotide exchange factor (GEF) 17
ARHGEF2	Rho/Rac guanine nucleotide exchange factor (GEF) 2
ARHGEF3	Rho guanine nucleotide exchange factor (GEF) 3
ARID1B	AT rich interactive domain 1B (SWI1-like)
ARID4A	AT rich interactive domain 4A (RBP1-like)
ARID4B	AT rich interactive domain 4B (RBP1-like)
ARID5B	AT rich interactive domain 5B (MRF1-like)
ARIH1	ariadne homolog, ubiquitin-conjugating enzyme E2 binding protein, 1 (Drosophila)
ASAP1	ArfGAP with SH3 domain, ankyrin repeat and PH domain 1
ASH1L	ash1 (absent, small, or homeotic)-like (Drosophila)

ASH2L	ash2 (absent, small, or homeotic)-like (Drosophila)
ASTN1	astrotactin 1
ASUN	asunder spermatogenesis regulator
ASXL3	additional sex combs like 3 (Drosophila)
ATAD2	ATPase family, AAA domain containing 2
ATAD2B	ATPase family, AAA domain containing 2B
ATG13	autophagy related 13
ATG2A	autophagy related 2A
ATG4B	autophagy related 4B, cysteine peptidase
ATP11A	ATPase, class VI, type 11A
ATP13A1	ATPase type 13A1
ATP13A3	ATPase type 13A3
ATP1A1	ATPase, Na ⁺ /K ⁺ transporting, alpha 1 polypeptide
ATP1A3	ATPase, Na ⁺ /K ⁺ transporting, alpha 3 polypeptide
ATP2B1	ATPase, Ca ⁺⁺ transporting, plasma membrane 1
ATP2B2	ATPase, Ca ⁺⁺ transporting, plasma membrane 2
ATP8B2	ATPase, aminophospholipid transporter, class I, type 8B, member 2
ATRN	attractin
ATXN2	ataxin 2
ATXN2L	ataxin 2-like
B4GALT5	UDP-Gal:betaGlcNAc beta 1,4- galactosyltransferase, polypeptide 5
BACE1	beta-site APP-cleaving enzyme 1
BAG6	BAG cochaperone 6
BAI2	brain-specific angiogenesis inhibitor 2
BAI3	brain-specific angiogenesis inhibitor 3
BAZ1B	bromodomain adjacent to zinc finger domain, 1B
BAZ2A	bromodomain adjacent to zinc finger domain, 2A
BAZ2B	bromodomain adjacent to zinc finger domain, 2B
BBX	bobby sox homolog (Drosophila)
BCAR3	breast cancer anti-estrogen resistance 3
BCL9L	B-cell CLL/lymphoma 9-like
BCR	breakpoint cluster region
BMS1	BMS1 homolog, ribosome assembly protein (yeast)
BNC2	basonuclin 2

BOD1L1	Biorientation Of Chromosomes In Cell Division 1 Like 1
BPTF	bromodomain PHD finger transcription factor
BRD2	bromodomain containing 2
BRD7	bromodomain containing 7
BRINP1	BMP/Retinoic Acid Inducible Neural Specific 1
BRINP2	BMP/Retinoic Acid Inducible Neural Specific 2
BRPF3	bromodomain and PHD finger containing, 3
BRWD1	bromodomain and WD repeat domain containing 1
BRWD3	bromodomain and WD repeat domain containing 3
BSN	bassoon (presynaptic cytomatrix protein)
BTBD11	BTB (POZ) domain containing 11
C10orf12	chromosome 10 open reading frame 12
C10orf2	chromosome 10 open reading frame 2
C11orf57	chromosome 11 open reading frame 57
C20orf112	chromosome 20 open reading frame 112
C7orf55-LUC7L2	chromosome 7 open reading frame 55 and LUC7-like 2
CA10	carbonic anhydrase X
CABP1	calcium binding protein 1
CACNA1B	calcium channel, voltage-dependent, N type, alpha 1B subunit
CACNA1D	calcium channel, voltage-dependent, L type, alpha 1D subunit
CACNA1E	calcium channel, voltage-dependent, R type, alpha 1E subunit
CACNA1G	calcium channel, voltage-dependent, T type, alpha 1G subunit
CACNA2D2	calcium channel, voltage-dependent, alpha 2/delta subunit 2
CACNA2D3	calcium channel, voltage-dependent, alpha 2/delta subunit 3
CACNB1	calcium channel, voltage-dependent, beta 1 subunit
CACNG3	calcium channel, voltage-dependent, gamma subunit 3
CACTIN	Cactin, Spliceosome C Complex Subunit
CAD	carbamoyl-phosphate synthetase 2, aspartate transcarbamylase, and dihydroorotase
CADM1	cell adhesion molecule 1
CADM2	cell adhesion molecule 2

CADPS2	Ca ⁺⁺ -dependent secretion activator 2
CALCRL	calcitonin receptor-like
CAMSAP2	Calmodulin Regulated Spectrin Associated Protein Family Member 2
CAMSAP3	Calmodulin Regulated Spectrin Associated Protein Family Member 3
CAMTA2	calmodulin binding transcription activator 2
CBX8	chromobox homolog 8
CCDC88A	coiled-coil domain containing 88A
CCNJ	cyclin J
CCT5	chaperonin containing TCP1, subunit 5 (epsilon)
CCT6A	chaperonin containing TCP1, subunit 6A (zeta 1)
CCZ1	CCZ1 Homolog, Vacuolar Protein Trafficking And Biogenesis Associated
CDAN1	codanin 1
CDC42BPA	CDC42 binding protein kinase alpha (DMPK-like)
CDH9	cadherin 9, type 2 (T1-cadherin)
CDYL	chromodomain protein, Y-like
CELF4	CUGBP Elav-Like Family Member 4
CELSR1	cadherin, EGF LAG seven-pass G-type receptor 1 (flamingo homolog, Drosophila)
CELSR2	cadherin, EGF LAG seven-pass G-type receptor 2 (flamingo homolog, Drosophila)
CERS2	Ceramide Synthase 2
CFH	complement factor H
CHD3	chromodomain helicase DNA binding protein 3
CHD5	chromodomain helicase DNA binding protein 5
CHD6	chromodomain helicase DNA binding protein 6
CHD8	chromodomain helicase DNA binding protein 8
CHD9	chromodomain helicase DNA binding protein 9
CHMP7	charged multivesicular body protein 7
CHRM3	cholinergic receptor, muscarinic 3
CIC	capicua homolog (Drosophila)
CIT	citron (rho-interacting, serine/threonine kinase 21)
CIZ1	CDKN1A interacting zinc finger protein 1
CKAP5	cytoskeleton associated protein 5
CLASP2	cytoplasmic linker associated protein 2
CLCN7	chloride channel, voltage-sensitive 7

CLIP2	CAP-GLY domain containing linker protein 2
CLPTM1	cleft lip and palate associated transmembrane protein 1
CLSPN	claspin
CMTR1	Cap Methyltransferase 1
CNOT10	CCR4-NOT transcription complex, subunit 10
CNOT3	CCR4-NOT transcription complex, subunit 3
CNTN1	contactin 1
CNTN4	contactin 4
COBL	cordon-bleu homolog (mouse)
COL11A2	collagen, type XI, alpha 2
COL12A1	collagen, type XII, alpha 1
COL27A1	collagen, type XXVII, alpha 1
COL2A1	collagen, type II, alpha 1 collagen, type IV, alpha 3 (Goodpasture antigen)
COL4A3BP	binding protein
COLEC12	collectin sub-family member 12
COPG1	COPI Coat Complex Subunit Gamma 1
COPS5	COP9 constitutive photomorphogenic homolog subunit 5 (Arabidopsis)
COPS7A	COP9 constitutive photomorphogenic homolog subunit 7A (Arabidopsis)
CPE	carboxypeptidase E
CPNE6	copine VI (neuronal)
CPT1A	carnitine palmitoyltransferase 1A (liver)
CREB1	cAMP responsive element binding protein 1
CRTC2	CREB regulated transcription coactivator 2
CSF1R	colony stimulating factor 1 receptor
CSMD3	CUB and Sushi multiple domains 3
CSNK1D	casein kinase 1, delta
CTIF	Cap Binding Complex Dependent Translation Initiation Factor
CTNNA2	catenin (cadherin-associated protein), alpha 2
CTNND1	catenin (cadherin-associated protein), delta 1 catenin (cadherin-associated protein), delta 2 (neural)
CTNND2	plakophilin-related arm-repeat protein)
CTPS1	CTP Synthase 1
CTR9	Ctr9, Paf1/RNA polymerase II complex component, homolog (S. cerevisiae)

CUL2	cullin 2
CUL5	cullin 5
CUL9	cullin 9
CUX2	cut-like homeobox 2
CYFIP1	cytoplasmic FMR1 interacting protein 1
DAAM1	dishevelled associated activator of morphogenesis 1
DAB1	disabled homolog 1 (Drosophila)
DAG1	dystroglycan 1 (dystrophin-associated glycoprotein 1)
DAPK1	death-associated protein kinase 1
DAZL	deleted in azoospermia-like
DCAF10	DDB1 And CUL4 Associated Factor 10
DCAF5	DDB1 and CUL4 associated factor 5
DCC	deleted in colorectal carcinoma
DCHS1	dachsous 1 (Drosophila)
DCP1A	DCP1 decapping enzyme homolog A (S. cerevisiae)
DDB1	damage-specific DNA binding protein 1, 127kDa
DDHD1	DDHD domain containing 1
DDI2	DNA-damage inducible 1 homolog 2 (S. cerevisiae)
DDN	dendrin
DDX4	DEAD (Asp-Glu-Ala-Asp) box polypeptide 4
DDX46	DEAD (Asp-Glu-Ala-Asp) box polypeptide 46
DENND1A	DENN/MADD domain containing 1A
DENND2A	DENN/MADD domain containing 2A
DENND4B	DENN/MADD domain containing 4B
DENND5A	DENN/MADD domain containing 5A
DEPDC5	DEP domain containing 5
DGKD	diacylglycerol kinase, delta 130kDa
DHCR24	24-dehydrocholesterol reductase
DHX36	DEAH (Asp-Glu-Ala-His) box polypeptide 36
DHX8	DEAH (Asp-Glu-Ala-His) box polypeptide 8
DHX9	DEAH (Asp-Glu-Ala-His) box polypeptide 9
DIDO1	death inducer-obliterators 1
DIP2B	DIP2 disco-interacting protein 2 homolog B (Drosophila)
DKFZP761J1410	Lipid phosphate phosphatase-related protein type 2
DLC1	deleted in liver cancer 1
DLG5	discs, large homolog 5 (Drosophila)

DLGAP2	discs, large (Drosophila) homolog-associated protein 2
DLGAP3	discs, large (Drosophila) homolog-associated protein 3
DLGAP4	discs, large (Drosophila) homolog-associated protein 4
DLL1	delta-like 1 (Drosophila)
DLST	Dihydrolipoamide S-Succinyltransferase
DMBX1	diencephalon/mesencephalon homeobox 1
DMD	dystrophin
DMTF1	cyclin D binding myb-like transcription factor 1
DNAJC2	DnaJ (Hsp40) homolog, subfamily C, member 2
DNAJC3	DnaJ (Hsp40) homolog, subfamily C, member 3
DNAJC6	DnaJ (Hsp40) homolog, subfamily C, member 6
DOCK11	dedicator of cytokinesis 11
DOCK3	dedicator of cytokinesis 3
DOCK4	dedicator of cytokinesis 4
DOCK9	dedicator of cytokinesis 9
DOPEY1	dopey family member 1
DPP6	dipeptidyl-peptidase 6
DPP8	dipeptidyl-peptidase 8
DPP9	dipeptidyl-peptidase 9
DRG1	developmentally regulated GTP binding protein 1
DSCAML1	Down syndrome cell adhesion molecule like 1
DST	dystonin
DVL3	dishevelled, dsh homolog 3 (Drosophila)
DYNC1H1	dynein, cytoplasmic 1, heavy chain 1
DYNC1LI1	dynein, cytoplasmic 1, light intermediate chain 1
DYRK1B	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1B
DYRK2	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2
ECE1	endothelin converting enzyme 1
EDC4	enhancer of mRNA decapping 4
EEF2	eukaryotic translation elongation factor 2
EFEMP1	EGF containing fibulin-like extracellular matrix protein 1
EFHC2	EF-hand domain (C-terminal) containing 2
EGFR	epidermal growth factor receptor
EGLN1	egl nine homolog 1 (C. elegans)

EHBP1	EH domain binding protein 1
EIF2B5	eukaryotic translation initiation factor 2B, subunit 5 epsilon, 82kDa
EIF3D	eukaryotic translation initiation factor 3, subunit D
EIF4A2	eukaryotic translation initiation factor 4A2
EIF4ENIF1	eukaryotic translation initiation factor 4E nuclear import factor 1
EIF5	eukaryotic translation initiation factor 5
ELMO1	engulfment and cell motility 1
EML1	echinoderm microtubule associated protein like 1
EP400	E1A binding protein p400
EPHA4	EPH receptor A4
EPHB1	EPH receptor B1
EPHB4	EPH receptor B4
	v-erb-b2 erythroblastic leukemia viral oncogene homolog 2, neuro/glioblastoma derived oncogene
ERBB2	homolog (avian)
ERBB2IP	erbb2 interacting protein
	v-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian)
ERBB4	
ERC2	ELKS/RAB6-interacting/CAST family member 2
ESRRG	estrogen-related receptor gamma
EYA1	eyes absent homolog 1 (Drosophila)
EYA3	eyes absent homolog 3 (Drosophila)
F2	coagulation factor II (thrombin)
FAM208A	transcription activation suppressor
FAM208B	transcription activation suppressor family member 2
FAM214A	atos homolog A
FARSB	phenylalanyl-tRNA synthetase, beta subunit
FAT3	FAT tumor suppressor homolog 3 (Drosophila)
FAT4	FAT tumor suppressor homolog 4 (Drosophila)
FBRS	fibrosin
FBXL20	F-box and leucine-rich repeat protein 20
FBXO28	F-box protein 28
FBXO41	F-box protein 41
FBXO42	F-box protein 42
FCHO1	FCH domain only 1
FCHO2	FCH domain only 2

FCHSD2	FCH and double SH3 domains 2
FGD5	FYVE, RhoGEF and PH domain containing 5
FGF8	fibroblast growth factor 8 (androgen-induced)
FGFR1	fibroblast growth factor receptor 1
FLCN	folliculin
FLNA	filamin A, alpha
FLNC	filamin C, gamma
FLRT3	fibronectin leucine rich transmembrane protein 3
FLT1	fms-related tyrosine kinase 1 (vascular endothelial growth factor/vascular permeability factor receptor)
FMN2	formin 2
FNDC3A	fibronectin type III domain containing 3A
FNDC3B	fibronectin type III domain containing 3B
FOXJ2	forkhead box J2
FOXJ3	forkhead box J3
FOXP1	forkhead box P1
FRY	furry homolog (Drosophila)
FRYL	FRY-like
FURIN	furin (paired basic amino acid cleaving enzyme)
FUS	fused in sarcoma
FXR2	fragile X mental retardation, autosomal homolog 2
FZD4	frizzled family receptor 4
G3BP1	GTPase activating protein (SH3 domain) binding protein 1
G3BP2	GTPase activating protein (SH3 domain) binding protein 2
GABRA1	gamma-aminobutyric acid (GABA) A receptor, alpha 1
GABRA5	gamma-aminobutyric acid (GABA) A receptor, alpha 5
GABRB1	gamma-aminobutyric acid (GABA) A receptor, beta 1
GABRB2	gamma-aminobutyric acid (GABA) A receptor, beta 2
GABRG2	gamma-aminobutyric acid (GABA) A receptor, gamma 2
GANAB	glucosidase, alpha; neutral AB
GATAD2A	GATA zinc finger domain containing 2A
GCN1L1	GCN1 general control of amino-acid synthesis 1-like 1 (yeast)
GFPT1	glutamine--fructose-6-phosphate transaminase 1
GIGYF1	GRB10 interacting GYF protein 1

GIT1	G protein-coupled receptor kinase interacting ArfGAP 1
GLI2	GLI family zinc finger 2
GLTSCR1L	BICRA like chromatin remodeling complex associated protein
GLUL	glutamate-ammonia ligase
GLYR1	glyoxylate reductase 1 homolog
GMEB2	glucocorticoid modulatory element binding protein 2
GNAI1	guanine nucleotide binding protein (G protein), alpha inhibiting activity polypeptide 1
GNAO1	guanine nucleotide binding protein (G protein), alpha activating activity polypeptide O
GNAS	GNAS complex locus
GOLGA2	golgin A2
GOLGA8M	golgin A8 family member M
GON4L	gon-4-like (C. elegans)
GPR116	G protein-coupled receptor 116
GPR125	G protein-coupled receptor 125
GRIA1	glutamate receptor, ionotropic, AMPA 1
GRIA2	glutamate receptor, ionotropic, AMPA 2
GRIA4	glutamate receptor, ionotropic, AMPA 4
GRID2	glutamate receptor, ionotropic, delta 2
GRIP1	glutamate receptor interacting protein 1
GRM2	glutamate receptor, metabotropic 2
GRM3	glutamate receptor, metabotropic 3
GRM4	glutamate receptor, metabotropic 4
GRM5	glutamate receptor, metabotropic 5
GRM7	glutamate receptor, metabotropic 7
GSPT2	G1 to S phase transition 2
GTF2E1	general transcription factor IIE, polypeptide 1, alpha 56kDa
GTPBP1	GTP binding protein 1
HCFC2	host cell factor C2
HCN1	hyperpolarization activated cyclic nucleotide-gated potassium channel 1
HDAC5	histone deacetylase 5
HDAC7	histone deacetylase 7
HDAC9	histone deacetylase 9
HDLBP	high density lipoprotein binding protein

HEATR1	HEAT repeat containing 1
HECTD1	HECT domain containing E3 ubiquitin protein ligase 1
HECTD4	HECT domain E3 ubiquitin protein ligase 4
HECW1	HECT, C2 and WW domain containing E3 ubiquitin protein ligase 1
HERC1	HECT and RLD domain containing E3 ubiquitin protein ligase family member 1
HERC2	HECT and RLD domain containing E3 ubiquitin protein ligase 2
HIAT1	hippocampus abundant transcript 1
HIF1A	hypoxia inducible factor 1, alpha subunit (basic helix-loop-helix transcription factor)
HINFP	histone H4 transcription factor
HIP1	huntingtin interacting protein 1
HIRA	HIR histone cell cycle regulation defective homolog A (<i>S. cerevisiae</i>)
HIVEP1	human immunodeficiency virus type I enhancer binding protein 1
HNF4A	hepatocyte nuclear factor 4, alpha
HNRNPM	heterogeneous nuclear ribonucleoprotein M
HOMER1	homer homolog 1 (<i>Drosophila</i>)
HOXA3	homeobox A3
HP1BP3	heterochromatin protein 1, binding protein 3
HSP90B1	heat shock protein 90kDa beta (Grp94), member 1
HSPA12A	heat shock 70kDa protein 12A
HSPA14	heat shock 70kDa protein 14
HSPA8	heat shock 70kDa protein 8
HSPD1	heat shock 60kDa protein 1 (chaperonin)
HUNK	hormonally up-regulated Neu-associated kinase
HYOU1	hypoxia up-regulated 1
IGF2R	insulin-like growth factor 2 receptor
IGSF3	immunoglobulin superfamily, member 3
IGSF9B	immunoglobulin superfamily member 9B
INCENP	inner centromere protein antigens 135/155kDa
INO80D	INO80 complex subunit D
INPP4A	inositol polyphosphate-4-phosphatase, type I, 107kDa
INTS3	integrator complex subunit 3
INTS8	integrator complex subunit 8

IPO11	importin 11
IPO8	importin 8
IQSEC3	IQ motif and Sec7 domain 3
ITGA5	integrin, alpha 5 (fibronectin receptor, alpha polypeptide)
ITPR1	inositol 1,4,5-trisphosphate receptor, type 1
ITSN1	intersectin 1 (SH3 domain protein)
IVNS1ABP	influenza virus NS1A binding protein
JADE2	jade family PHD finger 2
JAK3	Janus kinase 3
JAKMIP1	janus kinase and microtubule interacting protein 1
JMY	junction mediating and regulatory protein, p53 cofactor
JPH3	junctophilin 3
KALRN	kalirin, RhoGEF kinase
KANK2	KN motif and ankyrin repeat domains 2
KAT2B	K(lysine) acetyltransferase 2B
KAT7	lysine acetyltransferase 7
KCND2	potassium voltage-gated channel, Shal-related subfamily, member 2
KCNQ4	potassium voltage-gated channel, KQT-like subfamily, member 4
KCTD3	potassium channel tetramerisation domain containing 3
KDM3A	lysine (K)-specific demethylase 3A
KDM5A	lysine (K)-specific demethylase 5A
KDM5C	lysine (K)-specific demethylase 5C
KDM7A	lysine demethylase 7A
KIAA0232	KIAA0232
KIAA0907	KIAA0907
KIAA0922	KIAA0922
KIAA1244	KIAA1244
KIAA1429	KIAA1429
KIAA1549	KIAA1549
KIF13A	kinesin family member 13A
KIF1B	kinesin family member 1B
KIF21B	kinesin family member 21B
KIF3A	kinesin family member 3A
KIF5A	kinesin family member 5A

KIRREL	kin of IRRE like (Drosophila)
KIRREL3	kin of IRRE like 3 (Drosophila)
KIT	v-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog
KLHL3	kelch-like 3 (Drosophila)
KMT2C	lysine methyltransferase 2C
KMT2D	lysine methyltransferase 2D
KRT1	keratin 1
L3MBTL3	l(3)mbt-like 3 (Drosophila)
LAMC1	laminin, gamma 1 (formerly LAMB2)
LARGE	like-glycosyltransferase
LCK	lymphocyte-specific protein tyrosine kinase
LCP2	lymphocyte cytosolic protein 2 (SH2 domain containing leukocyte protein of 76kDa)
LEMD3	LEM domain containing 3
LEPR	leptin receptor
LHX2	LIM homeobox 2
LIMCH1	LIM and calponin homology domains 1
LIMK1	LIM domain kinase 1
LINGO1	leucine rich repeat and Ig domain containing 1
LLGL1	lethal giant larvae homolog 1 (Drosophila)
LPHN1	latrophilin 1
LPHN3	latrophilin 3
LRCH1	leucine-rich repeats and calponin homology (CH) domain containing 1
LRP1	low density lipoprotein receptor-related protein 1
LRP1B	low density lipoprotein receptor-related protein 1B
LRP2	low density lipoprotein receptor-related protein 2
LRP6	low density lipoprotein receptor-related protein 6
LRP8	low density lipoprotein receptor-related protein 8, apolipoprotein e receptor
LRRC41	leucine rich repeat containing 41
LRRC4C	leucine rich repeat containing 4C
LRRC8A	leucine rich repeat containing 8 family, member A
LRRTM2	leucine rich repeat transmembrane neuronal 2
LTBP3	latent transforming growth factor beta binding protein 3
LTBP4	latent transforming growth factor beta binding protein 4
LYST	lysosomal trafficking regulator

MACF1	microtubule-actin crosslinking factor 1
MAGEL2	MAGE-like 2
MAGI1	membrane associated guanylate kinase, WW and PDZ domain containing 1
MAML2	mastermind-like 2 (Drosophila)
MAP1A	microtubule-associated protein 1A
MAP2K1	mitogen-activated protein kinase kinase 1
MAP3K12	mitogen-activated protein kinase kinase kinase 12
MAP3K4	mitogen-activated protein kinase kinase kinase 4
MAP3K9	mitogen-activated protein kinase kinase kinase 9
MAP4	microtubule-associated protein 4
MAP4K5	mitogen-activated protein kinase kinase kinase kinase 5
MAP7	microtubule-associated protein 7
MAPK8IP1	mitogen-activated protein kinase 8 interacting protein 1
MAPKBP1	mitogen-activated protein kinase binding protein 1
MAPRE1	microtubule-associated protein, RP/EB family, member 1
MARK2	MAP/microtubule affinity-regulating kinase 2
MAST3	microtubule associated serine/threonine kinase 3
MBD1	methyl-CpG binding domain protein 1
MBD6	methyl-CpG binding domain protein 6
MDGA1	MAM domain containing glycosylphosphatidylinositol anchor 1
MDN1	MDN1, midasin homolog (yeast)
MED1	mediator complex subunit 1
MED12L	mediator complex subunit 12-like
MED13	mediator complex subunit 13
MED15	mediator complex subunit 15
MEF2D	myocyte enhancer factor 2D
MEGF10	multiple EGF-like-domains 10
MEGF8	multiple EGF-like-domains 8
MEPCE	methylphosphate capping enzyme
MEST	mesoderm specific transcript homolog (mouse)
MET	met proto-oncogene (hepatocyte growth factor receptor)
METTTL16	methyltransferase like 16
MFN2	mitofusin 2
MFSD2A	MFSD2 lysolipid transporter A, lysophospholipid

MICAL3	microtubule associated monooxygenase, calponin and LIM domain containing 3
MLLT4	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 4
MLLT6	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 6
MLXIP	MLX interacting protein
MORC2	MORC family CW-type zinc finger 2
MORC4	MORC family CW-type zinc finger 4
MOV10	Mov10, Moloney leukemia virus 10, homolog (mouse)
MPHOSPH8	M-phase phosphoprotein 8
MPP1	membrane protein, palmitoylated 1, 55kDa
MPPED2	metallophosphoesterase domain containing 2
MRC2	mannose receptor, C type 2
MTA2	metastasis associated 1 family, member 2
MTF1	metal-regulatory transcription factor 1
MTMR12	myotubularin related protein 12
MTMR3	myotubularin related protein 3
MTOR	mechanistic target of rapamycin (serine/threonine kinase)
MTPAP	mitochondrial poly(A) polymerase
MYCBP2	MYC binding protein 2, E3 ubiquitin protein ligase
MYEF2	myelin expression factor 2
MYH14	myosin, heavy chain 14, non-muscle
MYO18A	myosin XVIII A
MYO9A	myosin IX A
MYO9B	myosin IX B
MYT1	myelin transcription factor 1
NAA15	N-alpha-acetyltransferase 15, NatA auxiliary subunit
NACC1	nucleus accumbens associated 1, BEN and BTB (POZ) domain containing
NAV3	neuron navigator 3
NCDN	neurochondrin
NCOA1	nuclear receptor coactivator 1
NCOA3	nuclear receptor coactivator 3
NCOA6	nuclear receptor coactivator 6
NCOA7	nuclear receptor coactivator 7
NCOR1	nuclear receptor corepressor 1

NCOR2	nuclear receptor corepressor 2
NDST1	N-deacetylase/N-sulfotransferase (heparan glucosaminyl) 1
NDUFS2	NADH dehydrogenase (ubiquinone) Fe-S protein 2, 49kDa (NADH-coenzyme Q reductase)
NEMF	nuclear export mediator factor
NEURL4	neuralized homolog 4 (Drosophila)
NF1	neurofibromin 1
NFASC	neurofascin
NFATC4	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 4
NFIA	nuclear factor I/A
NFIL3	nuclear factor, interleukin 3 regulated
NFIX	nuclear factor I/X (CCAAT-binding transcription factor)
NFKBIZ	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, zeta
NKD1	naked cuticle homolog 1 (Drosophila)
NKTR	natural killer-tumor recognition sequence
NLGN2	neuroligin 2
NMT1	N-myristoyltransferase 1
NNT	nicotinamide nucleotide transhydrogenase
NOP56	NOP56 ribonucleoprotein homolog (yeast)
NOS1	nitric oxide synthase 1 (neuronal)
NPAS2	neuronal PAS domain protein 2
NR2C2	nuclear receptor subfamily 2, group C, member 2
NR3C2	nuclear receptor subfamily 3, group C, member 2
NRXN1	neurexin 1
NRXN2	neurexin 2
NRXN3	neurexin 3
NSD1	nuclear receptor binding SET domain protein 1
NTN4	netrin 4
NUMA1	nuclear mitotic apparatus protein 1
NUP155	nucleoporin 155kDa
NUP188	nucleoporin 188kDa
NUP205	nucleoporin 205kDa
NUP214	nucleoporin 214kDa

NYAP2	neuronal tyrosine-phosphorylated phosphoinositide-3-kinase adaptor 2
ODC1	ornithine decarboxylase 1
ONECUT2	one cut homeobox 2
OPN5	opsin 5
OSBP	oxysterol binding protein
OSBPL9	oxysterol binding protein-like 9
OXSRL1	oxidative-stress responsive 1
PABPC1L	poly(A) binding protein, cytoplasmic 1-like protein kinase C and casein kinase substrate in neurons 1
PACSIN1	1
PAK7	p21 protein (Cdc42/Rac)-activated kinase 7
PAN2	PAN2 poly(A) specific ribonuclease subunit homolog (S. cerevisiae)
PAPPA	pregnancy-associated plasma protein A, pappalysin 1
PARK7	parkinson protein 7
PATL1	protein associated with topoisomerase II homolog 1 (yeast)
PAXBP1	PAX3 and PAX7 binding protein 1
PBX1	pre-B-cell leukemia homeobox 1
PCDH17	protocadherin 17
PCLO	piccolo (presynaptic cytomatrix protein)
PCNX	pecanex homolog (Drosophila)
PCSK2	proprotein convertase subtilisin/kexin type 2
PDE2A	phosphodiesterase 2A, cGMP-stimulated
PDE4A	phosphodiesterase 4A, cAMP-specific
PDGFC	platelet derived growth factor C
PDPK1	3-phosphoinositide dependent protein kinase-1
PDS5B	PDS5, regulator of cohesion maintenance, homolog B (S. cerevisiae)
PDZD2	PDZ domain containing 2
PDZRN3	PDZ domain containing ring finger 3
PELI2	pellino E3 ubiquitin protein ligase family member 2
PELP1	proline, glutamate and leucine rich protein 1
PHACTR3	phosphatase and actin regulator 3
PHC3	polyhomeotic homolog 3 (Drosophila)
PHF2	PHD finger protein 2
PHF20	PHD finger protein 20

PHIP	pleckstrin homology domain interacting protein
PHKA2	phosphorylase kinase, alpha 2 (liver)
PI4K2A	phosphatidylinositol 4-kinase type 2 alpha
PI4KB	phosphatidylinositol 4-kinase, catalytic, beta
PICALM	phosphatidylinositol binding clathrin assembly protein
PIK3C2B	phosphoinositide-3-kinase, class 2, beta polypeptide
PIK3CA	phosphoinositide-3-kinase, catalytic, alpha polypeptide
PIK3CB	phosphoinositide-3-kinase, catalytic, beta polypeptide
PIK3CD	phosphoinositide-3-kinase, catalytic, delta polypeptide
PIK3R2	phosphoinositide-3-kinase, regulatory subunit 2 (beta)
PIKFYVE	phosphoinositide kinase, FYVE finger containing
PITPNC1	phosphatidylinositol transfer protein, cytoplasmic 1
PITPNM2	phosphatidylinositol transfer protein, membrane-associated 2
PKM	pyruvate kinase M1/2
PLCB3	phospholipase C, beta 3 (phosphatidylinositol-specific)
PLCG2	phospholipase C, gamma 2 (phosphatidylinositol-specific)
PLCL2	phospholipase C-like 2
PLEKHA5	pleckstrin homology domain containing, family A member 5
PLEKHA6	pleckstrin homology domain containing, family A member 6
PLEKHO1	pleckstrin homology domain containing, family O member 1
PLXNA1	plexin A1
PLXNA2	plexin A2
PLXNA4	plexin A4
PLXND1	plexin D1
PML	promyelocytic leukemia
PNISR	PNN interacting serine and arginine rich protein
POLR1A	polymerase (RNA) I polypeptide A, 194kDa
POLR2A	polymerase (RNA) II (DNA directed) polypeptide A, 220kDa
POLR2B	polymerase (RNA) II (DNA directed) polypeptide B, 140kDa
POU2F1	POU class 2 homeobox 1
PPARGC1A	peroxisome proliferator-activated receptor gamma, coactivator 1 alpha

PPFIA3	protein tyrosine phosphatase, receptor type, f polypeptide (PTPRF), interacting protein (liprin), alpha 3
PPIG	peptidylprolyl isomerase G (cyclophilin G)
PPP1R13B	protein phosphatase 1, regulatory subunit 13B
PPP2R3A	protein phosphatase 2, regulatory subunit B", alpha
PPP3CB	protein phosphatase 3, catalytic subunit, beta isozyme
PPP5C	protein phosphatase 5, catalytic subunit
PPP6R1	protein phosphatase 6 regulatory subunit 1
PPRC1	peroxisome proliferator-activated receptor gamma, coactivator-related 1
PRDM10	PR domain containing 10
PRDM2	PR domain containing 2, with ZNF domain
PREX1	phosphatidylinositol-3,4,5-trisphosphate-dependent Rac exchange factor 1
PRICKLE2	prickle homolog 2 (Drosophila)
PRKACA	protein kinase, cAMP-dependent, catalytic, alpha
PRKAR2A	protein kinase, cAMP-dependent, regulatory, type II, alpha
PRKCA	protein kinase C, alpha
PRKCG	protein kinase C, gamma
PRKDC	protein kinase, DNA-activated, catalytic polypeptide
PRMT5	protein arginine methyltransferase 5
PRPF38B	PRP38 pre-mRNA processing factor 38 (yeast) domain containing B
PRPF8	PRP8 pre-mRNA processing factor 8 homolog (S. cerevisiae)
PRR12	proline rich 12
PRR14L	proline rich 14 like
PRRC2A	proline rich coiled-coil 2A
PRRC2B	proline rich coiled-coil 2B
PSIP1	PC4 and SFRS1 interacting protein 1
PSMD11	proteasome (prosome, macropain) 26S subunit, non-ATPase, 11
PSME3	proteasome (prosome, macropain) activator subunit 3 (PA28 gamma; Ki)
PSME4	proteasome (prosome, macropain) activator subunit 4
PTBP3	polypyrimidine tract binding protein 3
PTCH1	patched 1

PTCHD1	patched domain containing 1
PTK2B	PTK2B protein tyrosine kinase 2 beta
PTPN14	protein tyrosine phosphatase, non-receptor type 14
PTPN2	protein tyrosine phosphatase, non-receptor type 2
PTPRB	protein tyrosine phosphatase, receptor type, B
PTPRK	protein tyrosine phosphatase, receptor type, K
PTPRT	protein tyrosine phosphatase, receptor type, T
PTPRU	protein tyrosine phosphatase, receptor type, U
PUM1	pumilio homolog 1 (Drosophila)
PXK	PX domain containing serine/threonine kinase
QRICH1	glutamine-rich 1
QSER1	glutamine and serine rich 1
RAB30	RAB30, member RAS oncogene family RAB3 GTPase activating protein subunit 2 (non-catalytic)
RAB3GAP2	
RAB4B	RAB4B, member RAS oncogene family
RABGAP1	RAB GTPase activating protein 1
RAD51	RAD51 homolog (S. cerevisiae)
RAD54L2	RAD54-like 2 (S. cerevisiae)
RAI1	retinoic acid induced 1
RALGPS2	Ral GEF with PH domain and SH3 binding motif 2
RANBP2	RAN binding protein 2
RAP1GAP	RAP1 GTPase activating protein
RAP1GAP2	RAP1 GTPase activating protein 2
RAPGEF5	Rap guanine nucleotide exchange factor (GEF) 5 Ras association (RalGDS/AF-6) and pleckstrin
RAPH1	homology domains 1 Ras protein-specific guanine nucleotide-releasing factor
RASGRF2	2 RAS guanyl releasing protein 2 (calcium and DAG-regulated)
RASGRP2	
RBBP6	retinoblastoma binding protein 6
RBL2	retinoblastoma-like 2 (p130)
RBM14	RNA binding motif protein 14
RBM15	RNA binding motif protein 15
RBM39	RNA binding motif protein 39
RBM5	RNA binding motif protein 5
RC3H1	ring finger and CCCH-type domains 1

RC3H2	ring finger and CCCH-type domains 2
RDX	radixin
RELN	reelin
REPS1	RALBP1 associated Eps domain containing 1
RERE	arginine-glutamic acid dipeptide (RE) repeats REV3-like, polymerase (DNA directed), zeta, catalytic subunit
REV3L	regulatory factor X, 3 (influences HLA class II expression)
RFX3	regulatory factor X, 4 (influences HLA class II expression)
RFX4	regulatory factor X, 4 (influences HLA class II expression)
RHOT1	ras homolog family member T1
RIC8B	resistance to inhibitors of cholinesterase 8 homolog B (C. elegans)
RICTOR	RPTOR independent companion of MTOR, complex 2
RIF1	RAP1 interacting factor homolog (yeast) required for meiotic nuclear division 5 homolog A (S. cerevisiae)
RMND5A	
RNF123	ring finger protein 123
RNF220	ring finger protein 220
RNF40	ring finger protein 40, E3 ubiquitin protein ligase roundabout, axon guidance receptor, homolog 2 (Drosophila)
ROBO2	
ROCK1	Rho-associated, coiled-coil containing protein kinase 1
ROR1	receptor tyrosine kinase-like orphan receptor 1
RORC	RAR-related orphan receptor C
RPL3	ribosomal protein L3
RPS3	ribosomal protein S3
RPS6KA5	ribosomal protein S6 kinase, 90kDa, polypeptide 5
RSPRY1	ring finger and SPRY domain containing 1
RTN1	reticulon 1
RUNDC3A	RUN domain containing 3A runt-related transcription factor 1; translocated to, 1 (cyclin D-related)
RUNX1T1	
RXRG	retinoid X receptor, gamma
RYR3	ryanodine receptor 3
SCAF1	SR-related CTD-associated factor 1
SCAF11	SR-related CTD-associated factor 11

SCHIP1	schwannomin interacting protein 1
SCN2A	sodium channel, voltage-gated, type II, alpha subunit
SCN3A	sodium channel, voltage-gated, type III, alpha subunit
SCN8A	sodium channel, voltage gated, type VIII, alpha subunit
SCRIB	scribbled homolog (Drosophila)
SEC24B	SEC24 family, member B (S. cerevisiae)
SEMA3A	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3A
SEMA3F	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3F
SEMA4D	sema domain, immunoglobulin domain (Ig), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 4D
SEMA6A	sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6A
SENP3	SUMO1/sentrin/SMT3 specific peptidase 3
SEPHS1	selenophosphate synthetase 1
SETD1A	SET domain containing 1A
SETD2	SET domain containing 2
SF3B3	splicing factor 3b, subunit 3, 130kDa
SFSWAP	splicing factor SWAP
SGIP1	SH3-domain GRB2-like (endophilin) interacting protein 1
SGTB	small glutamine-rich tetratricopeptide repeat (TPR)-containing, beta
SHANK1	SH3 and multiple ankyrin repeat domains 1
SHANK2	SH3 and multiple ankyrin repeat domains 2
SIK2	salt-inducible kinase 2
SIN3B	SIN3 transcription regulator homolog B (yeast)
SIPA1L1	signal-induced proliferation-associated 1 like 1
SIPA1L3	signal-induced proliferation-associated 1 like 3
SIRT1	sirtuin 1
SKAP2	src kinase associated phosphoprotein 2
SKI	v-ski sarcoma viral oncogene homolog (avian)
SKP2	S-phase kinase-associated protein 2, E3 ubiquitin protein ligase
SLC13A4	solute carrier family 13 (sodium/sulfate symporters), member 4

SLC18A2	solute carrier family 18 (vesicular monoamine), member 2
SLC24A3	solute carrier family 24 (sodium/potassium/calcium exchanger), member 3
SLC25A19	solute carrier family 25 (mitochondrial thiamine pyrophosphate carrier), member 19
SLC2A14	solute carrier family 2 (facilitated glucose transporter), member 14
SLC38A2	solute carrier family 38, member 2
SLC38A4	solute carrier family 38, member 4
SLC4A8	solute carrier family 4, sodium bicarbonate cotransporter, member 8
SLC6A1	solute carrier family 6 (neurotransmitter transporter, GABA), member 1
SLC6A17	solute carrier family 6, member 17
SLC6A3	solute carrier family 6 (neurotransmitter transporter, dopamine), member 3
SLC6A6	solute carrier family 6 (neurotransmitter transporter, taurine), member 6
SLC7A3	solute carrier family 7 (cationic amino acid transporter, y ⁺ system), member 3
SLIT2	slit homolog 2 (Drosophila)
SLIT3	slit homolog 3 (Drosophila)
SLITRK1	SLIT and NTRK-like family, member 1
SLTM	SAFB-like, transcription modulator
SMAD5	SMAD family member 5
SMARCA4	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily a, member 4
SMARCA4	SWI/SNF-related, matrix-associated actin-dependent regulator of chromatin, subfamily a, containing
SMARCA4	DEAD/H box 1
SMARCA4	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily c, member 2
SMARCC2	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily c, member 2
SMC1B	structural maintenance of chromosomes 1B
SMC3	structural maintenance of chromosomes 3
SMC5	structural maintenance of chromosomes 5
SMG6	smg-6 homolog, nonsense mediated mRNA decay factor (C. elegans)
SMG7	smg-7 homolog, nonsense mediated mRNA decay factor (C. elegans)

SMURF1	SMAD specific E3 ubiquitin protein ligase 1
SNIP1	Smad nuclear interacting protein 1
SNRNP200	small nuclear ribonucleoprotein 200kDa (U5)
SNW1	SNW domain containing 1
SNX27	sorting nexin family member 27
SOGA1	suppressor of glucose, autophagy associated 1
SORCS1	sortilin-related VPS10 domain containing receptor 1
SOS1	son of sevenless homolog 1 (Drosophila)
SOX6	SRY (sex determining region Y)-box 6
SP4	Sp4 transcription factor
SPAST	spastin
SPEG	SPEG complex locus
SPTB	spectrin, beta, erythrocytic
SPTBN1	spectrin, beta, non-erythrocytic 1
SPTY2D1	SPT2, Suppressor of Ty, domain containing 1 (S. cerevisiae)
SRCIN1	SRC kinase signaling inhibitor 1
SREBF1	sterol regulatory element binding transcription factor 1
SREBF2	sterol regulatory element binding transcription factor 2
SRGAP1	SLIT-ROBO Rho GTPase activating protein 1
SRGAP3	SLIT-ROBO Rho GTPase activating protein 3
SRPR	signal recognition particle receptor (docking protein)
SRSF6	serine and arginine rich splicing factor 6
SSH1	slingshot homolog 1 (Drosophila)
STAT1	signal transducer and activator of transcription 1, 91kDa signal transducer and activator of transcription 3 (acute-phase response factor)
STAT3	
STAT5B	signal transducer and activator of transcription 5B
STOX2	storkhead box 2
STRBP	spermatid perinuclear RNA binding protein
STXBP1	syntaxin binding protein 1
STXBP5	syntaxin binding protein 5 (tomosyn)
SUPT16H	suppressor of Ty 16 homolog (S. cerevisiae)
SUV420H1	suppressor of variegation 4-20 homolog 1 (Drosophila)
SVIL	supervillin
SYDE1	synapse defective 1, Rho GTPase, homolog 1 (C. elegans)

TAF5L	TAF5-like RNA polymerase II, p300/CBP-associated factor (PCAF)-associated factor, 65kDa
TANC2	tetratricopeptide repeat, ankyrin repeat and coiled-coil containing 2
TBC1D10B	TBC1 domain family, member 10B
TBC1D22A	TBC1 domain family, member 22A
TCERG1	transcription elongation regulator 1
TCF12	transcription factor 12
TCF7L2	transcription factor 7-like 2 (T-cell specific, HMG-box)
TECPR2	tectonin beta-propeller repeat containing 2
TENM3	teneurin transmembrane protein 3
TEX10	testis expressed 10
TEX264	testis expressed 264
THRB	thyroid hormone receptor, beta
THSD7A	thrombospondin, type I, domain containing 7A
TJP1	tight junction protein 1 (zona occludens 1)
TLE3	transducin-like enhancer of split 3 (E(sp1) homolog, Drosophila)
TLK2	tousled-like kinase 2
TLN1	talin 1
TLN2	talin 2
TM9SF4	transmembrane 9 superfamily protein member 4
TMEM108	transmembrane protein 108
TMEM132D	transmembrane protein 132D
TMEM165	transmembrane protein 165
TMEM63C	transmembrane protein 63C
TNIK	TRAF2 and NCK interacting kinase
TNPO2	transportin 2
TNR	tenascin R (restrictin, janusin)
TNRC18	trinucleotide repeat containing 18
TNRC6C	trinucleotide repeat containing 6C
TNS3	tensin 3
TOP1	topoisomerase (DNA) I
TP53BP1	tumor protein p53 binding protein 1
TP63	tumor protein p63
TPP2	tripeptidyl peptidase II
TPX2	TPX2, microtubule-associated, homolog (Xenopus laevis)

TRERF1	transcriptional regulating factor 1
TRIM33	tripartite motif containing 33
TRIM8	tripartite motif containing 8
TRIO	triple functional domain (PTPRF interacting)
TRMT12	tRNA methyltransferase 12 homolog (S. cerevisiae)
TRMT1L	tRNA methyltransferase 1 like
TRMT5	tRNA methyltransferase 5 homolog (S. cerevisiae)
TRPC4	transient receptor potential cation channel, subfamily C, member 4
TRPC4AP	transient receptor potential cation channel, subfamily C, member 4 associated protein
TRRAP	transformation/transcription domain-associated protein
TSHZ1	teashirt zinc finger homeobox 1
TTBK2	tau tubulin kinase 2
TTC17	tetratricopeptide repeat domain 17
TUBB3	tubulin beta 3 class III
TUBGCP3	tubulin, gamma complex associated protein 3
TULP4	tubby like protein 4
UBA3	ubiquitin-like modifier activating enzyme 3
UBA6	ubiquitin-like modifier activating enzyme 6
UBAP2	ubiquitin associated protein 2
UBE2Z	ubiquitin-conjugating enzyme E2Z
UBE4B	ubiquitination factor E4B
UBN1	ubinuclein 1
UBN2	ubinuclein 2
UBR2	ubiquitin protein ligase E3 component n-recognin 2
UBR4	ubiquitin protein ligase E3 component n-recognin 4
UBTF	upstream binding transcription factor, RNA polymerase I
UBXN4	UBX domain protein 4
UBXN7	UBX domain protein 7
UCHL1	ubiquitin carboxyl-terminal esterase L1 (ubiquitin thiolesterase)
UHRF1BP1L	UHRF1 binding protein 1-like
UHRF2	ubiquitin-like with PHD and ring finger domains 2, E3 ubiquitin protein ligase
UNC79	unc-79 homolog, NALCN channel complex subunit
USP10	ubiquitin specific peptidase 10

USP15	ubiquitin specific peptidase 15
USP19	ubiquitin specific peptidase 19
USP33	ubiquitin specific peptidase 33
USP42	ubiquitin specific peptidase 42
USP47	ubiquitin specific peptidase 47
USP5	ubiquitin specific peptidase 5 (isopeptidase T)
USP7	ubiquitin specific peptidase 7 (herpes virus-associated)
VCL	vinculin
VCP	valosin containing protein
VEZF1	vascular endothelial zinc finger 1
VPS13D	vacuolar protein sorting 13 homolog D (<i>S. cerevisiae</i>)
WDFY3	WD repeat and FYVE domain containing 3
WDR33	WD repeat domain 33
WDR47	WD repeat domain 47
WEE1	WEE1 homolog (<i>S. pombe</i>)
WHSC1	Wolf-Hirschhorn syndrome candidate 1
WNK1	WNK lysine deficient protein kinase 1
WWP1	WW domain containing E3 ubiquitin protein ligase 1
	XK, Kell blood group complex subunit-related family, member 6
XKR6	
XPO4	exportin 4
XPO7	exportin 7
XPOT	exportin, tRNA (nuclear export receptor for tRNAs)
XPR1	xenotropic and polytropic retrovirus receptor 1
XYLT1	xylosyltransferase I
YEATS2	YEATS domain containing 2
YLPM1	YLP motif containing 1
ZBTB17	zinc finger and BTB domain containing 17
ZBTB21	zinc finger and BTB domain containing 21
ZBTB4	zinc finger and BTB domain containing 4
ZBTB7C	zinc finger and BTB domain containing 7C
ZC3H7B	zinc finger CCCH-type containing 7B
ZCCHC6	zinc finger, CCHC domain containing 6
ZDHHC14	zinc finger, DHHC-type containing 14
ZEB1	zinc finger E-box binding homeobox 1
ZFC3H1	zinc finger, C3H1-type containing
ZFHX3	zinc finger homeobox 3

ZFHX4	zinc finger homeobox 4
ZFR	zinc finger RNA binding protein
ZFYVE9	zinc finger, FYVE domain containing 9
ZMYND11	zinc finger, MYND-type containing 11
ZMYND8	zinc finger, MYND-type containing 8
ZNF133	zinc finger protein 133
ZNF407	zinc finger protein 407
ZNF445	zinc finger protein 445
ZNF512B	zinc finger protein 512B
ZNF521	zinc finger protein 521
ZNF532	zinc finger protein 532
ZNF536	zinc finger protein 536
ZNF574	zinc finger protein 574
ZNF592	zinc finger protein 592
ZNF628	zinc finger protein 628
ZNF629	zinc finger protein 629
ZNF644	zinc finger protein 644
ZNF710	zinc finger protein 710
ZNF711	zinc finger protein 711
ZNF777	zinc finger protein 777
ZNF827	zinc finger protein 827
ZNFX1	zinc finger, NFX1-type containing 1
ZSWIM8	zinc finger SWIM-type containing 8
ZZZ3	zinc finger, ZZ-type containing 3
ZNF606	zinc finger protein 606
NR1H4	nuclear receptor subfamily 1, group H, member 4
TUSC2	tumor suppressor candidate 2
ALX1	ALX homeobox 1
SNX17	sorting nexin 17
UBR1	ubiquitin protein ligase E3 component n-recognin 1
C1orf115	chromosome 1 open reading frame 115
KCND3	potassium voltage-gated channel, Shal-related subfamily, member 3
CYB5R3	cytochrome b5 reductase 3
PRG4	proteoglycan 4
GPRASP1	G protein-coupled receptor associated sorting protein 1
IMPAD1	inositol monophosphatase domain containing 1

PRKCI	protein kinase C, iota
WDR36	WD repeat domain 36
CNKSRR3	CNKSRR family member 3
RFK	riboflavin kinase
ST3GAL4	ST3 beta-galactoside alpha-2,3-sialyltransferase 4
SYNPR	synaptoporin
CCL25	chemokine (C-C motif) ligand 25
ETS1	v-ets erythroblastosis virus E26 oncogene homolog 1 (avian)
SPIN2A	spindlin family, member 2A
FUBP3	far upstream element (FUSE) binding protein 3
OR1C1	olfactory receptor, family 1, subfamily C, member 1
SYT13	synaptotagmin XIII
TMX2	thioredoxin-related transmembrane protein 2
OR7G3	olfactory receptor, family 7, subfamily G, member 3
CASS4	Cas scaffolding protein family member 4
DYNLRB2	dynein, light chain, roadblock-type 2
TSKU	tsukushi small leucine rich proteoglycan homolog (Xenopus laevis)
GPR158	G protein-coupled receptor 158
HSD17B6	hydroxysteroid (17-beta) dehydrogenase 6 homolog (mouse)
SEC14L1	SEC14-like 1 (S. cerevisiae)
ADIPOR1	adiponectin receptor 1
CBX4	chromobox homolog 4
FAM81A	family with sequence similarity 81, member A
GRAP2	GRB2-related adaptor protein 2
KCNK5	potassium channel, subfamily K, member 5
KRTAP17-1	keratin associated protein 17-1
LIN28A	lin-28 homolog A
NMT2	N-myristoyltransferase 2
PPP2R1A	protein phosphatase 2, regulatory subunit A, alpha
RAB24	RAB24, member RAS oncogene family
REEP2	receptor accessory protein 2
SERPINB5	serpin peptidase inhibitor, clade B (ovalbumin), member 5
ZBTB7B	zinc finger and BTB domain containing 7B
HOMEZ	homeobox and leucine zipper encoding

RNASE1	ribonuclease, RNase A family, 1 (pancreatic)
SMOX	spermine oxidase
ST8SIA2	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 2
ATF7	activating transcription factor 7
KCNB1	potassium voltage-gated channel, Shab-related subfamily, member 1
PAX5	paired box 5
CHD2	chromodomain helicase DNA binding protein 2
HNRNPU	heterogeneous nuclear ribonucleoprotein U (scaffold attachment factor A)
ZMYM2	zinc finger, MYM-type 2
BMPR1B	bone morphogenetic protein receptor, type IB
KCMF1	potassium channel modulatory factor 1
KDM5B	lysine (K)-specific demethylase 5B
YPEL4	yippee-like 4 (Drosophila)
CCAR2	cell cycle and apoptosis regulator 2
AK4	adenylate kinase 4
FGF9	fibroblast growth factor 9 (glia-activating factor)
GPR34	G protein-coupled receptor 34
CYTH2	cytohesin 2
GPHN	gephyrin
SMAD2	SMAD family member 2
CDK5	cyclin-dependent kinase 5
SMC1A	structural maintenance of chromosomes 1A
KCNJ6	potassium inwardly-rectifying channel, subfamily J, member 6
LTBR	lymphotoxin beta receptor (TNFR superfamily, member 3)
MIA3	melanoma inhibitory activity family, member 3
SRP9	signal recognition particle 9kDa
HNF1B	HNF1 homeobox B
GAPDH	glyceraldehyde-3-phosphate dehydrogenase
KLHL26	kelch-like 26 (Drosophila)
MADD	MAP-kinase activating death domain
RPL38	ribosomal protein L38
TMEM178A	transmembrane protein 178A
BCKDK	branched chain ketoacid dehydrogenase kinase

UBE2Q1	ubiquitin-conjugating enzyme E2Q family member 1
HIST3H2A	histone cluster 3, H2a
LNK2	ligand of numb-protein X 2
CLEC16A	C-type lectin domain family 16, member A
DCAF12L1	DDB1 and CUL4 associated factor 12 like 1
PDZD8	PDZ domain containing 8
RAB6A	RAB6A, member RAS oncogene family
SV2A	synaptic vesicle glycoprotein 2A
MMP16	matrix metalloproteinase 16 (membrane-inserted)
STT3A	STT3, subunit of the oligosaccharyltransferase complex, homolog A (<i>S. cerevisiae</i>)
ATP6V0D1	ATPase, H ⁺ transporting, lysosomal 38kDa, V0 subunit d1
FZD7	frizzled family receptor 7
FRG2	FSHD region gene 2
KCNS2	potassium voltage-gated channel, delayed-rectifier, subfamily S, member 2
EFTUD2	elongation factor Tu GTP binding domain containing 2
MED12	mediator complex subunit 12
ERLIN1	ER lipid raft associated 1
GNB1	guanine nucleotide binding protein (G protein), beta polypeptide 1
PICK1	protein interacting with PRKCA 1
ADAMTS10	ADAM metalloproteinase with thrombospondin type 1 motif, 10
SAMD8	sterile alpha motif domain containing 8
HIST2H2AB	histone cluster 2, H2ab
HDAC3	histone deacetylase 3
KLHL31	kelch-like 31 (<i>Drosophila</i>)
SOX17	SRY (sex determining region Y)-box 17
MED23	mediator complex subunit 23
CRAMP1L	Crm, cramped-like (<i>Drosophila</i>)
EIF2S1	eukaryotic translation initiation factor 2, subunit 1 alpha, 35kDa
FBXL3	F-box and leucine-rich repeat protein 3
RHOA	ras homolog family member A
SPCS2	signal peptidase complex subunit 2 homolog (<i>S. cerevisiae</i>)

TOMM22	translocase of outer mitochondrial membrane 22 homolog (yeast)
CSNK2A2	casein kinase 2, alpha prime polypeptide
ZYG11B	zyg-11 homolog B (C. elegans)
NPR2	natriuretic peptide receptor B/guanylate cyclase B (atrionatriuretic peptide receptor B)
*This table lists $n=1046$ genes used to perform enrichment analyses with iFC maps in the present study. The list combines two sets of genes (set 1 $n=932$, set 2 $n=114$) selected from a larger list of genes analyzed in Satterstrom et al (2019). Set 1 encompasses $n=932$ genes with similarly high rate of protein truncating variants (PTVs) in ASD and ADHD including genes with high probability (>0.9) of loss-of-function intolerant (pLI) (see the original supplementary file 3 in Satterstrom et al., 2019). Set 2 includes $n=114$ genes with both PTVs at $pLI < 0.9$ (without including the 932 mentioned above) and Missense (Mis) variants at pLI above and below 0.9 that we identified based on two-tailed Fisher z exact tests comparing the rate of variants between ‘cases’ (i.e., ASD and ADHD) without intellectual disability vs. controls among 1,514 genes listed in Satterstrom et al's original supplementary file 4 (Satterstrom et al. 2019).	

Table S5. Comorbid psychiatric diagnoses information in the primary diagnosis groups

Variable	Combined Sample	ASD	ADHD _{w/o ASD}
	N=166	n=63	n=103
Number of psychiatric comorbid diagnoses #, (%)			
No Comorbidities	58 (35)	4 (6)	54 (52)
1 Comorbidity	58 (35)	25 (40)	33 (32)
> 1 Comorbidities	50 (30)	34 (54)	16 (16)
Type of Comorbid disorders, #, (%)			
ADHD only	NA	22 (35)	NA
Any Anxiety disorder only ^a	21 (13)	3 (5)	18 (17)
Behavioral Disruptive Disorders only ^b	10 (6)	1 (2)	9 (9)
ADHD + Anxiety ^c	18 (11)	18 (29)	NA
ADHD + other behavioral disruptive disorders ^d	5 (3)	5 (8)	NA
Anxiety + Mood disorders ^e	6 (4)	1 (2)	5 (5)
SCD only and combined with others ^f	2 (1)	NA	2 (2)
Elimination only and combined with other disorders ^g	16 (10)	8 (13)	8 (8)
Specific Learning Disorders only and combined with others ^h	6 (4)	1* (2)	5 (5)
Tic disorders only or combined with others ⁱ	3 (2)	1 (2)	2 (2)
a. n=16 children with ADHDw/oASD had a comorbid anxiety disorder alone: anxiety NOS (5), GAD (3), separation anxiety (3), social phobia (2) and specific phobia (3). And 2 had 2 comorbid anxiety disorders: social phobia in combination with specific phobia (1) and separation anxiety (1). 2 children with ASD had a comorbid anxiety disorder alone : anxiety NOS (1) and social phobia (1). 1 child with ASD had comorbid separation anxiety and GAD; b. 8 children with ADHD and 1 child with ASD had comorbid ODD only. 1 child with ADHD had a comorbid other disruptive impulse-control disorder; c. 18 children with ASD with comorbid ADHD in combination with one anxiety disorder (13): specific phobia (5), anxiety NOS (3), GAD (2), social phobia (1) and separation anxiety (2); 1 children combined with ODD and separation anxiety and 4 combined with specific phobia (1 with ODD, 1 with anxiety NOS, 1 with anxiety NOS and mood NOS and 1 with social phobia, GAD and separation anxiety); d. 5 children with ASD and comorbid ADHD combined with ODD (from which 1 child had a second disruptive control disorder); e. 3 children with ADHD and comorbid mood NOS combined with anxiety NOS (1), with OCD (1, also combined with DMDD) and with GAD and specific learning disorder (1). 1 children with ADHD and comorbid ODD combined with GAD; f. 1 child with ADHD and comorbid dysthymia with separation anxiety. 1 child with ASD and comorbid specific phobia in combination with DMDD; g. 2 children with ADHD : one with comorbid SCD alone and one in combination with social phobia and GAD; h. From those 8 children with ADHD and comorbid elimination disorders, 4 had comorbid enuresis only and 2 had comorbid enuresis combined with GAD. 2 children had both enuresis and encopresis combined with ODD (1) and specific language disorder (1). From those 8 with ASD, 2 comorbid encopresis and 4 enuresis combined with ADHD; and 1 child comorbid enureis and encopresis in combination with ADHD and ODD. 1 child with ASD had comorbid enuresis with specific learning disorder; i. From those 5 children with ADHD with comorbid specific learning disorders, 3 were alone and 2 combined (2 with anxiety NOS, from which 1 with OCD and ODD). A child with ASD had comorbid specific learning disorder combined with enuresis (double counted*); j. From those 2 children with ADHD with comorbid tic disorder, one child had comorbid tic disorder alone and 1 combined with ODD and a third comorbid encopresis disorder. 1 child with ASD had a comorbid tic disorder combined with ADHD.			

Table S6. List of the $n=107$ genes enriched among those expressed across middle frontal gyrus iFC map.

Gene symbol	Gene name
ABR	active BCR-related
ACTN2	actinin, alpha 2
AP2S1	adaptor-related protein complex 2, sigma 1 subunit
ARHGGEF17	Rho guanine nucleotide exchange factor (GEF) 17
ARID5B	AT rich interactive domain 5B (MRF1-like)
ASTN1	astrotactin 1
ASXL3	additional sex combs like 3 (Drosophila)
BAI2	brain-specific angiogenesis inhibitor 2
BTBD11	BTB (POZ) domain containing 11
C20orf112	chromosome 20 open reading frame 112
CACNB1	calcium channel, voltage-dependent, beta 1 subunit
CACNG3	calcium channel, voltage-dependent, gamma subunit 3
CDH9	cadherin 9, type 2 (T1-cadherin)
CHRM3	cholinergic receptor, muscarinic 3
COL12A1	collagen, type XII, alpha 1
CSNK2A2	cascin kinase 2, alpha prime polypeptide
CTNNA2	catenin (cadherin-associated protein), alpha 2
CTNND2	catenin (cadherin-associated protein), delta 2 (neural plakophilin-related arm-repeat protein)
CUX2	cut-like homeobox 2
DIDO1	death inducer-oblierator 1
DLGAP2	discs, large (Drosophila) homolog-associated protein 2
DMBX1	diencephalon/mesencephalon homeobox 1
DOCK3	dedicator of cytokinesis 3
DPP6	dipeptidyl-peptidase 6
ECE1	endothelin converting enzyme 1
EPHB1	EPH receptor B1
EPHB4	EPH receptor B4
ERBB4	v-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian)
ERC2	ELKS/RAB6-interacting/CAST family member 2
FAM81A	family with sequence similarity 81, member A
FGD5	FYVE, RhoGEF and PH domain containing 5
FMN2	formin 2
FZD4	frizzled family receptor 4
FZD7	frizzled family receptor 7
G3BP2	GTPase activating protein (SH3 domain) binding protein 2
GABRG2	gamma-aminobutyric acid (GABA) A receptor, gamma 2
GPRASP1	G protein-coupled receptor associated sorting protein 1
GRM3	glutamate receptor, metabotropic 3
HIST3H2A	histone cluster 3, H2a
HIVEP1	human immunodeficiency virus type 1 enhancer binding protein 1
HSPA12A	heat shock 70kDa protein 12A
IGSF3	immunoglobulin superfamily, member 3
JAKMIP1	janus kinase and microtubule interacting protein 1
KCNB1	potassium voltage-gated channel, Shab-related subfamily, member 1
KCND2	potassium voltage-gated channel, Shal-related subfamily, member 2
KCNS2	potassium voltage-gated channel, delayed-rectifier, subfamily S, member 2
KIF5A	kinesin family member 5A
KIT	v-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog
LCP2	lymphocyte cytosolic protein 2 (SH2 domain containing leukocyte protein of 76kDa)
LHX2	LIM homeobox 2
LIMK1	LIM domain kinase 1
LRCH1	leucine-rich repeats and calponin homology (CH) domain containing 1
LRRC4C	leucine rich repeat containing 4C
MAML2	mastermind-like 2 (Drosophila)
MAP1A	microtubule-associated protein 1A
MAST3	microtubule associated serine/threonine kinase 3
MED13	mediator complex subunit 13
MED15	mediator complex subunit 15
MMP16	matrix metalloproteinase 16 (membrane-inserted)
MYT1	myelin transcription factor 1
NFIA	nuclear factor I/A
NPR2	natriuretic peptide receptor B/guanylate cyclase B (atrionatriuretic peptide receptor B)
NTN4	netrin 4
NUP205	nucleoporin 205kDa
PATL1	protein associated with topoisomerase II homolog 1 (yeast)
PBX1	pre-B-cell leukemia homeobox 1
PCSK2	proprotein convertase subtilisin/kexin type 2
PDE2A	phosphodiesterase 2A, cGMP-stimulated
PDZD2	PDZ domain containing 2
PDZRN3	PDZ domain containing ring finger 3
PELI2	pellino E3 ubiquitin protein ligase family member 2
PHC3	polyhomeotic homolog 3 (Drosophila)
PLCB3	phospholipase C, beta 3 (phosphatidylinositol-specific)
PLXND1	plexin D1
PRPF38B	PRP38 pre-mRNA processing factor 38 (yeast) domain containing B
PTPRK	protein tyrosine phosphatase, receptor type, K
PTPRT	protein tyrosine phosphatase, receptor type, T
RASGRF2	Ras protein-specific guanine nucleotide-releasing factor 2
REV3L	REV3-like, polymerase (DNA directed), zeta, catalytic subunit
SCAF11	SR-related CTD-associated factor 11
SEC24B	SEC24 family, member B (S. cerevisiae)
SEMA3A	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3A
SGTB	small glutamine-rich tetratricopeptide repeat (TPR)-containing, beta
SHANK1	SH3 and multiple ankyrin repeat domains 1
SIK2	salt-inducible kinase 2
SIPA1L3	signal-induced proliferation-associated 1 like 3
SIRT1	sirtuin 1
SKAP2	src kinase associated phosphoprotein 2
SKP2	S-phase kinase-associated protein 2, E3 ubiquitin protein ligase
SLC24A3	solute carrier family 24 (sodium/potassium/calcium exchanger), member 3
SLIT2	slit homolog 2 (Drosophila)
SLITRK1	SLIT and NTRK-like family, member 1
SORCS1	sortilin-related VPS10 domain containing receptor 1
SOX6	SRY (sex determining region Y)-box 6
TAF5L	TAF5-like RNA polymerase II, p300/CBP-associated factor (PCAF)-associated factor, 65kDa
TANC2	tetratricopeptide repeat, ankyrin repeat and coiled-coil containing 2
TCERG1	transcription elongation regulator 1
TMEM132D	transmembrane protein 132D
TPP2	tripeptidyl peptidase II
TSKU	tsukushi small leucine rich proteoglycan homolog (Xenopus laevis)
TTC17	tetratricopeptide repeat domain 17
UBN2	ubiquitin 2
UCHL1	ubiquitin carboxyl-terminal esterase L1 (ubiquitin thiolesterase)
USP5	ubiquitin specific peptidase 5 (isopeptidase T)
ZDHHC14	zinc finger, DHHC-type containing 14
ZNF521	zinc finger protein 521
ZNF532	zinc finger protein 532

Table S7. Genetic Ontology (GO) terms significantly associated with the n=107 genes enriched in our MFG iFC map sorted following their hierarchical relations provided by the GO database.

GO Biological Process	# genes	Expected	Fold enrichment	FDR-p value
axonogenesis / axonogenesis involved in innervation	14/3	1.9/0.05	7.35/64.75	0.0000094 /0.00488
cell morphogenesis involved in neuron differentiation	17	2.31	7.36	0.000002
neuron development	20	4.47	4.47	0.000018
cell development	30	11.53	2.6	0.000408
cell differentiation	36	18.81	1.91	0.016100
cellular developmental process	36	18.82	1.91	0.016000
developmental process	50	29.54	1.69	0.009070
anatomical structure development	49	26.93	1.82	0.002760
neuron differentiation	25	5.64	4.44	0.000001
generation of neurons	26	6.03	4.31	0.000001
neurogenesis	27	6.93	3.9	0.000002
nervous system development	35	11.36	3.08	0.000002
system development	44	18.25	2.41	0.000009
multicellular organism development	46	20.41	2.25	0.000018
multicellular organismal process	57	34.72	1.64	0.004380
cell morphogenesis	20	3.58	5.58	0.000001
anatomical structure morphogenesis	32	11.53	2.78	0.000042
neuron projection morphogenesis	16	2.53	6.33	0.000010
neuron projection development	17	3.61	4.7	0.000091
plasma membrane bounded cell projection organization	21	5.95	3.53	0.000284
cell projection organization	21	6.2	3.39	0.000486
cellular component organization	48	29.01	1.65	0.019400
cellular component organization or biogenesis	48	30.12	1.59	0.041700
plasma membrane bounded cell projection morphogenesis	16	2.55	6.27	0.000010
cell projection morphogenesis	16	2.58	6.2	0.000009
cellular anatomical entity morphogenesis	17	3.15	5.4	0.000017
axon development	14	2.18	6.43	0.000035
dendritic spine morphogenesis	3	0.09	32.38	0.024000
neuron projection organization	4	0.23	17.66	0.020200
synapse organization	13	1.77	7.36	0.000024
cell junction organization	15	2.78	5.39	0.000093
dendrite development	6	0.59	10.22	0.008900
dendrite morphogenesis	5	0.33	15.18	0.007140
olfactory bulb development	4	0.18	22.2	0.009550
olfactory lobe development	4	0.19	21	0.011500
brain development	13	3.82	3.4	0.025700
head development	14	4.08	3.43	0.016100
axon extension	4	0.24	16.53	0.024900
developmental growth	11	2.22	4.95	0.005690
growth	11	2.22	4.95	0.005840
ovulation cycle process	4	0.24	16.53	0.024500
protein localization to synapse	5	0.32	15.42	0.006770
protein localization to cell junction	5	0.46	10.79	0.024300
female gonad development	6	0.48	12.53	0.004070
development of primary female sexual characteristics	6	0.5	12.02	0.004750
female sex differentiation	6	0.58	10.41	0.008600
regulation of axonogenesis	6	0.81	7.38	0.035600
regulation of neuron projection development	11	2.36	4.66	0.008410
regulation of plasma membrane bounded cell projection organization	12	3.38	3.55	0.031300
regulation of cell projection organization	12	3.46	3.47	0.036400
regulation of cellular process	79	57.48	1.37	0.007430
regulation of biological process	85	60.34	1.41	0.000407
biological regulation	86	62.5	1.38	0.000818
regulation of anatomical structure morphogenesis	15	4.35	3.45	0.008800
ameboid-type cell migration	7	1.03	6.8	0.020500
axon guidance	7	1.17	5.96	0.036400
neuron projection guidance	7	1.17	5.96	0.035900
positive regulation of nervous system development	8	1.51	5.29	0.031600
regulation of nervous system development	10	2.39	4.19	0.030800
modulation of chemical synaptic transmission	13	2.48	5.24	0.000752
regulation of trans-synaptic signaling	13	2.49	5.23	0.000738
regulation of cell communication	34	17.71	1.92	0.025500
regulation of signaling	35	17.68	1.98	0.010700
chemical synaptic transmission	10	2.16	4.63	0.017300
anterograde trans-synaptic signaling	10	2.16	4.63	0.017000
trans-synaptic signaling	10	2.25	4.44	0.022400
synaptic signaling	10	2.4	4.16	0.032000
signaling	47	26.3	1.79	0.005370
cell communication	49	27.09	1.81	0.002780
regulation of neurogenesis	9	2	4.49	0.036200
enzyme-linked receptor protein signaling pathway	13	3.16	4.11	0.006200
cell surface receptor signaling pathway	26	10.7	2.43	0.005570
behavior	12	3.25	3.69	0.024200
cell adhesion	17	4.92	3.45	0.003780
animal organ morphogenesis	15	5.13	2.93	0.036600
regulation of molecular function	26	10.34	2.52	0.003770
regulation of biological quality	33	14.67	2.25	0.003150
*Only genetic ontology (GO) terms surviving FDR correction at q<0.05 are shown. Gene ontology database sorts biological process terms based on their hierarchical relations going from the most specific to more general terms. Multiple terms may share hierarchical relationships with more general terms in that case the "parent" term would appear indented directly below the specific term. Examples of broad biological process terms are <i>multicellular organismal processes</i> or <i>nervous system development</i> . Examples of more specific terms are <i>axonogenesis</i> or <i>dendritic spine morphogenesis</i> . The top 20 statistically significant terms are indicated as bold text. Most these terms are associated to the parent term <i>neuron projection morphogenesis</i> and their most specific related terms are <i>axonogenesis</i> and <i>regulation of axonogenesis</i> , <i>dendritic spine morphogenesis</i> , <i>axon extension</i> and <i>axon guidance</i> , their hierarchical relationship and definitions are described in Figure S6.				