

Supplemental Material

	N	Hemoglobin AA	N	Hemoglobin SS	P
		Median (IQR)		Median (IQR)	
Age (years)	17	37 (28, 48)	33	35 (29, 46)	0.7
Female gender n (%)	17	8 (47)	33	15 (45)	1
Systolic blood pressure (mm Hg)	16	125 (115, 135)	33	120 (116, 125)	0.3
Diastolic blood pressure (mm Hg)	16	77 (69, 81)	33	69 (60, 77)	0.053
Pulse pressure (mm Hg)	16	48 (45, 56)	33	52 (46, 58)	0.5
Hemoglobin O ₂ saturation (%)	16	99 (98, 99)	32	98 (95, 99)	0.017
Hemoglobin (g/dl)	17	13.5 (12.9, 13.9)	33	8.4 (7.7, 10.0)	<0.001
Reticulocytes (1000/ μ l)	15	59.2 (41.7, 74.2)	33	231 (136.3, 291)	<0.001
White blood cells (1000/ μ l)	17	6 (5.4, 6.5)	33	9.9 (8.3, 11.2)	<0.001
Platelet counts (1000/ μ l)	17	241 (216, 271)	33	349 (251, 394)	0.009
Lactate dehydrogenase (U/l)	17	152 (140, 177)	33	309 (216, 397)	<0.001
Aspartate aminotransferase (U/l)	17	24 (21, 30)	32	32.5 (28, 41)	0.002
Bilirubin (mg/dl)	17	0.8 (0.6, 1)	32	2.6 (1.9, 3.5)	<0.001
Creatinine (mg/dl)	17	1.0 (0.9, 1.1)	33	0.7 (0.6, 0.9)	0.007
Erythropoietin (IU/l)	16	7.8 (6.4, 10.2)	33	64 (42.2, 92.9)	<0.001
Ferritin (μ g/l)	17	97 (63, 201)	33	572 (259, 1278)	<0.001
Tricuspid regurgitation velocity (m/sec)	17	2.2 (2.2, 2.3)	33	2.6 (2.4, 2.7)	<0.001

Supplemental Table 1. Summary for the clinical covariates between hemoglobin AA and hemoglobin SS subjects in the Howard University cohort. P value represents Wilcoxon's rank sum test for continuous covariates and Fisher's exact test for categorical covariates.

	Hemoglobin AA		Hemoglobin SC		P	Hemoglobin S β^+ -thalassemia		P
	N	Median (IQR)	N	Median (IQR)		N	Mean (Range)	
Age (years)	17	37 (28, 48)	7	47 (38.5, 53)	0.3	2	50.5 (46 , 55)	0.3
Female gender n (%)	17	8 (47)	7	1 (14)	0.2	2	1 (50%)	1
Systolic blood pressure (mm Hg)	16	125 (115.2, 135)	7	129 (119, 135)	0.8	2	110.5 (110, 111)	0.1
Diastolic blood pressure (mm Hg)	16	76.5 (69.2, 81.2)	7	75 (74, 78)	>0.9	2	71.5 (66, 77)	0.5
Pulse pressure (mm Hg)	16	48 (44.5, 56.2)	7	52 (44.5, 58.5)	0.9	2	39 (33, 45)	0.1
Hemoglobin O ₂ saturation (%)	16	99 (98, 99)	7	97 (96.5, 98)	0.032	2	98.5 (98, 99)	1
Hemoglobin (g/dl)	17	13.5 (12.9, 13.9)	7	11.7 (11.5, 13.1)	0.039	2	10.3 (9.2, 11.5)	0.028
Reticulocyte count (1000/ul)	15	59.2 (41.7, 74.2)	6	164 (138, 180)	0.004	2	129 (99, 159)	0.062
White blood cells (1000/ul)	17	6 (5.4, 6.5)	7	8.9 (8.7, 9.6)	0.02	2	9.5 (4.9, 14.1)	0.6
Platelets (1000/ul)	17	241 (216, 271)	7	297 (249, 357)	0.1	2	221.5 (204, 239)	0.4
Lactate dehydrogenase (U/l)	17	152 (140, 177)	7	249 (222, 271.5)	<0.001	2	262.5 (234, 291)	0.028
Aspartate aminotransferase (U/l)	17	24 (21, 30)	7	33 (31, 48.5)	0.013	2	21 (15, 27)	0.4
Bilirubin (mg/dl)	17	0.8 (0.6, 1)	7	1.5 (1.2, 2.4)	0.001	2	0.85 (0.8, 0.9)	0.8
Creatinine (mg/dl)	17	1 (0.9, 1.1)	7	0.9 (0.8, 1.2)	>0.9	2	0.8 (0.6, 1)	0.2
Erythropoietin (IU/l)	16	7.8 (6.4, 10.2)	7	47.8 (20.9, 51.1)	<0.001	2	28.6 (14.2, 43.1)	0.042
Ferritin (ug/l)	17	97 (63, 201)	7	291 (140, 1151.5)	0.07	2	361 (195, 527)	0.1
Tricuspid regurgitation velocity (m/sec)	17	2.2 (2.2, 2.3)	7	2.5 (2.1, 2.6)	0.2	2	2.85 (2.6, 3.1)	0.029

Supplemental Table 2. Summary for the clinical covariates between hemoglobin AA control and hemoglobin SC or hemoglobin S β^+ -thalassemia individuals. P value represents Wilcoxon's rank sum test for continuous covariates and Fisher's exact test for categorical covariates.

AffyID	Fold Change	Gene Symbol	Gene Annotation
2731332	4.88	IL8	interleukin 8
3759006	4.68	SLC4A1	solute carrier family 4, anion exchanger, member 1 (erythrocyte membrane protein band 3, Diego blood group)
3142967	4.60	CA1	carbonic anhydrase I
3360401	4.40	HBB	hemoglobin, beta
2435005	4.17	SELENBP1	selenium binding protein 1
3657253	3.29	AHSP	alpha hemoglobin stabilizing protein
2571510	3.18	IL1B	interleukin 1, beta
3090006	3.13	SLC25A37	solute carrier family 25, member 37
2777714	3.06	SNCA	synuclein, alpha (non A4 component of amyloid precursor)
2353988	3.05	FAM46C	family with sequence similarity 46, member C
3360417	2.98	HBD	hemoglobin, delta
3809621	2.93	FECH	ferrochelatase
3090053	2.81	SLC25A37	solute carrier family 25, member 37
2773434	2.81	CXCL2	chemokine (C-X-C motif) ligand 2
3621029	2.77	EPB42	erythrocyte membrane protein band 4.2
3025500	2.75	BPGM	2,3-bisphosphoglycerate mutase
3203855	2.71	DCAF12	DDB1 and CUL4 associated factor 12
3830484	2.42	FFAR2	free fatty acid receptor 2
3902489	2.38	BCL2L1	BCL2-like 1
2378068	2.36	G0S2	G0/G1switch 2
3642654	2.28	HBM	hemoglobin, mu
3444252	2.27	CSDA	cold shock domain protein A
2788003	2.20	GYPA	glycophorin A (MNS blood group)
3257204	2.19	IFIT3	interferon-induced protein with tetratricopeptide repeats 3
3066818	2.19	NAMPT	nicotinamide phosphoribosyltransferase
3561039	2.15	NFKBIA	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha
2468351	2.13	RSAD2	radical S-adenosyl methionine domain containing 2
2672096	2.10	CCR1	chemokine (C-C motif) receptor 1
3945515	2.04	APOBEC3A	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3A
2990464	2.02	ARL4A	ADP-ribosylation factor-like 4A
2775390	2.02	RASGEF1B	RasGEF domain family, member 1B
2830861	2.01	EGR1	early growth response 1
3257246	1.98	IFIT1	interferon-induced protein with tetratricopeptide repeats 1
3286921	1.98	March8	membrane-associated ring finger (C3HC4) 8
3862108	1.97	CLC	Charcot-Leyden crystal protein
3549575	1.97	IFI27	interferon, alpha-inducible protein 27

3091000	1.95	BNIP3L	BCL2/adenovirus E1B 19kDa interacting protein 3-like
3257192	1.95	IFIT2	interferon-induced protein with tetratricopeptide repeats 2
2448382	1.94	PTGS2	prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase)
2895945	1.94	CD83	CD83 molecule
3595594	1.92	AQP9	aquaporin 9
3942531	1.91	OSBP2	oxysterol binding protein 2
3181240	1.90	TMOD1	tropomodulin 1
2451463	1.89	ADIPOR1	adiponectin receptor 1
3759077	1.88	SLC25A39	solute carrier family 25, member 39
3703885	1.86	SLC7A5	solute carrier family 7 (cationic amino acid transporter, y+ system), member 5
2927506	1.86	TNFAIP3	tumor necrosis factor, alpha-induced protein 3
3905875	1.85	MAFB	v-maf musculoaponeurotic fibrosarcoma oncogene homolog B (avian)
3147508	1.83	KLF10	Kruppel-like factor 10
2343473	1.82	IFI44L	interferon-induced protein 44-like
2415084	1.82	JUN	jun proto-oncogene
2582124	1.81	NR4A2	nuclear receptor subfamily 4, group A, member 2
2347732	1.80	TMEM56-RWDD3	transmembrane protein 56
3214451	1.77	NFIL3	nuclear factor, interleukin 3 regulated
3217077	1.77	HEMGN	hemogen
3836266	1.77	FOSB	FBJ murine osteosarcoma viral oncogene homolog B
3838004	1.77	PPP1R15A	protein phosphatase 1, regulatory (inhibitor) subunit 15A
3680610	1.75	GSPT1	G1 to S phase transition 1
3132940	1.75	ANK1	ankyrin 1, erythrocytic
2390050	1.75	NLRP3	NLR family, pyrin domain containing 3
3352503	1.73	ARHGEF12	Rho guanine nucleotide exchange factor (GEF) 12
3781654	1.72	RIOK3	RIO kinase 3 (yeast)
2896545	1.71	GMPR	guanosine monophosphate reductase
2325274	1.71	PITHD1	chromosome 1 open reading frame 128
2953570	1.71	TREM1	triggering receptor expressed on myeloid cells 1
3246372	1.71	NCOA4	nuclear receptor coactivator 4
2321058	1.70	PRAMEF2	PRAME family member 2
3786868	1.70	SLC14A1	solute carrier family 14 (urea transporter), member 1 (Kidd blood group)
3943414	1.69	FBXO7	F-box protein 7
2982319	1.69	SOD2	superoxide dismutase 2, mitochondrial

3475794	1.69	HCAR3	hydroxycarboxylic acid receptor 3
3815014	1.66	BSG	basigin (Ok blood group)
2895841	1.66	CD83	CD83 molecule
3253880	1.66	PPIF	peptidylprolyl isomerase F
3527684	1.65	RNASE3	ribonuclease, RNase A family, 3
2878273	1.65	HBEGF	heparin-binding EGF-like growth factor
2372781	1.64	RGS1	regulator of G-protein signaling 1
3443868	1.64	CD69	CD69 molecule
3434413	1.64	RNF10	ring finger protein 10
2439373	1.63	SPTA1	spectrin, alpha, erythrocytic 1 (elliptocytosis 2)
3089102	1.62	EPB49	erythrocyte membrane protein band 4.9 (dematin)
3527514	1.62	PNP	purine nucleoside phosphorylase
3864551	1.62	PLAUR	plasminogen activator, urokinase receptor
2376376	1.62	TMCC2	transmembrane and coiled-coil domain family 2
2669930	1.61	CSRNP1	cysteine-serine-rich nuclear protein 1
3568534	1.61	SPTB	spectrin, beta, erythrocytic
3430086	1.60	TCP11L2	t-complex 11 (mouse)-like 2
3761725	1.60	PHOSPHO1	phosphatase, orphan 1
3862661	1.59	BLVRB	biliverdin reductase B (flavin reductase (NADPH))
3841862	1.59	FCAR	Fc fragment of IgA, receptor for
3115008	1.59	TRIB1	tribbles homolog 1 (Drosophila)
2778856	1.58	TSPAN5	tetraspanin 5
3890597	1.58	RBM38	RNA binding motif protein 38
2887309	1.58	DUSP1	dual specificity phosphatase 1
3944129	1.57	HMOX1	heme oxygenase (decycling) 1
3837257	1.57	C5AR1	complement component 5a receptor 1
2895792	1.57	RNF182	ring finger protein 182
4047185	1.56	CCRL2	chemokine (C-C motif) receptor-like 2
2796553	1.56	ACSL1	acyl-CoA synthetase long-chain family member 1
2401448	1.55	E2F2	E2F transcription factor 2
3331355	1.55	SERPING1	serpin peptidase inhibitor, clade G (C1 inhibitor), member 1
3724505	1.54	MYL4	myosin, light chain 4, alkali; atrial, embryonic
3237548	1.54	ARL5B	ADP-ribosylation factor-like 5B
3212919	1.53	ISCA1	iron-sulfur cluster assembly 1 homolog (S. cerevisiae)
3771543	1.53	UBE2O	ubiquitin-conjugating enzyme E2O
2510464	1.52	TNFAIP6	tumor necrosis factor, alpha-induced protein 6
3122721	1.52	DEFA4	defensin, alpha 4, corticostatin
2841699	1.51	CPEB4	cytoplasmic polyadenylation element binding protein 4
3456688	1.51	GPR84	G protein-coupled receptor 84

2975014	1.51	SGK1	serum/glucocorticoid regulated kinase 1
3884524	1.51	BPI	bactericidal/permeability-increasing protein
2442698	1.51	CREG1	cellular repressor of E1A-stimulated genes 1
3821893	1.50	JUNB	jun B proto-oncogene
3299469	1.50	ANKRD22	ankyrin repeat domain 22
7385547	1.49	CCL2	chemokine (C-C motif) ligand 2
3820443	1.49	ICAM1	intercellular adhesion molecule 1
2403261	1.49	IFI6	interferon, alpha-inducible protein 6
2487549	1.49	MXD1	MAX dimerization protein 1
2343511	1.49	IFI44	interferon-induced protein 44
2731513	1.48	EREG	epiregulin
2707764	1.47	DCUN1D1	DCN1, defective in cullin neddylation 1, domain containing 1 (S. cerevisiae)
3543979	1.47	C14orf45	chromosome 14 open reading frame 45
3623655	1.47	HDC	histidine decarboxylase
3922100	1.47	MX1	myxovirus (influenza virus) resistance 1, interferon-inducible protein p78 (mouse)
2940202	1.47	F13A1	coagulation factor XIII, A1 polypeptide
2594812	1.47	TRAK2	trafficking protein, kinesin binding 2
3125571	1.47	MSR1	macrophage scavenger receptor 1
2948630	1.46	IER3	immediate early response 3
2527580	1.46	CXCR2	chemokine (C-X-C motif) receptor 2
3722872	1.46	RUNDC3A	RUN domain containing 3A
3832978	1.45	ZFP36	zinc finger protein 36, C3H type, homolog (mouse)
3770345	1.45	CD300E	CD300e molecule
3550077	1.45	GLRX5	glutaredoxin 5
2379132	1.45	ATF3	activating transcription factor 3
2421883	1.45	GBP1	guanylate binding protein 1, interferon-inducible, 67kDa
3957188	1.44	OSM	oncostatin M
2592268	1.44	STAT1	signal transducer and activator of transcription 1, 91kDa
3072276	1.44	UBE2H	ubiquitin-conjugating enzyme E2H (UBC8 homolog, yeast)
2737840	1.44	CISD2	CDGSH iron sulfur domain 2
2833024	1.44	RNF14	ring finger protein 14
3740664	1.44	MIR22HG	MIR22 host gene
3215146	1.44	NINJ1	ninjurin 1
3759137	1.44	ITGA2B	integrin, alpha 2b (platelet glycoprotein IIb of IIb/IIIa complex, antigen CD41)
3475782	1.44	HCAR2	hydroxycarboxylic acid receptor 2
3364306	1.44	SOX6	SRY (sex determining region Y)-box 6
2902416	1.43	TNF	tumor necrosis factor
3894322	1.43	SRXN1	sulfiredoxin 1
3464860	1.42	DUSP6	dual specificity phosphatase 6
2599303	1.42	CXCR1	chemokine (C-X-C motif) receptor 1

3223928	1.42	STOM	stomatin
3944564	1.42	CSF2RB	colony stimulating factor 2 receptor, beta, low-affinity (granulocyte-macrophage)
3106243	1.42	RIPK2	receptor-interacting serine-threonine kinase 2
2599153	1.42	TNS1	tensin 1
3714729	1.42	MAP2K3	mitogen-activated protein kinase kinase 3
3791935	1.42	SERPINB2	serpin peptidase inhibitor, clade B (ovalbumin), member 2
3511698	1.42	EPSTI1	epithelial stromal interaction 1 (breast)
2875348	1.42	IRF1	interferon regulatory factor 1
3790704	1.41	PMAIP1	phorbol-12-myristate-13-acetate-induced protein 1
2775259	1.41	RASGEF1B	RasGEF domain family, member 1B
2363689	1.41	FCGR2A	Fc fragment of IgG, low affinity IIa, receptor (CD32)
3320123	1.41	ADM	adrenomedullin
2863885	1.41	LHFPL2	lipoma HMGIC fusion partner-like 2
3850676	1.41	KANK2	KN motif and ankyrin repeat domains 2
2692060	1.40	PARP9	poly (ADP-ribose) polymerase family, member 9
2405312	1.40	RNF19B	ring finger protein 19B
2327677	1.40	EPB41	erythrocyte membrane protein band 4.1 (elliptocytosis 1, RH-linked)
3432467	1.40	OAS3	2'-5'-oligoadenylate synthetase 3, 100kDa
2447066	1.40	GLUL	glutamate-ammonia ligase
2772566	1.40	IGJ	immunoglobulin J polypeptide, linker protein for immunoglobulin alpha and mu polypeptides
3326400	1.40	CAT	catalase
2403446	1.40	PTAFR	platelet-activating factor receptor
3594129	1.40	MAPK6	mitogen-activated protein kinase 6
2828479	1.40	SLC22A4	solute carrier family 22 (organic cation/ergothioneine transporter), member 4
3592401	1.40	C15orf48	chromosome 15 open reading frame 48
3351841	1.40	HMBS	hydroxymethylbilane synthase
3332276	1.39	MS4A2	membrane-spanning 4-domains, subfamily A, member 2 (Fc fragment of IgE, high affinity I, receptor for; beta polypeptide)
3863723	1.39	CEACAM8	carcinoembryonic antigen-related cell adhesion molecule 8
3474831	1.39	OASL	2'-5'-oligoadenylate synthetase-like
3869237	1.39	FPR1	formyl peptide receptor 1
3672830	1.39	MAP1LC3B	microtubule-associated protein 1 light chain 3 beta
3320717	1.39	MICAL2	microtubule associated monooxygenase, calponin and LIM domain containing 2
2632491	1.39	NSUN3	NOP2/Sun domain family, member 3
3695867	1.39	RANBP10	RAN binding protein 10

3860101	1.39	NFKBID	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, delta
3885464	1.39	TOP1	topoisomerase (DNA) I
2882834	1.39	C5orf4	chromosome 5 open reading frame 4
2731373	1.39	PF4V1	platelet factor 4 variant 1
3305313	1.39	ITPRIP	inositol 1,4,5-triphosphate receptor interacting protein
3669059	1.38	GABARAPL2	GABA(A) receptor-associated protein-like 2
3855071	1.38	FKBP8	FK506 binding protein 8, 38kDa
2411173	1.38	PDZK1IP1	PDZK1 interacting protein 1
3502710	1.38	TFDP1	transcription factor Dp-1
2648677	1.38	MME	membrane metallo-endopeptidase
3945006	1.38	H1F0	H1 histone family, member 0
3404636	1.38	GABARAPL1	GABA(A) receptor-associated protein like 1
2672140	1.38	LTF	lactotransferrin
3263624	1.37	MXI1	MAX interactor 1
3089816	1.37	TNFRSF10C	tumor necrosis factor receptor superfamily, member 10c, decoy without an intracellular domain
3862640	1.37	SERTAD1	SERTA domain containing 1
2708922	1.37	IGF2BP2	insulin-like growth factor 2 mRNA binding protein 2
3428573	1.37	SPIC	Spi-C transcription factor (Spi-1/PU.1 related)
2651782	1.37	SEC62	SEC62 homolog (S. cerevisiae)
3352813	1.37	TBCEL	tubulin folding cofactor E-like
3839920	1.37	FPR3	formyl peptide receptor 3
2922215	1.37	MARCKS	myristoylated alanine-rich protein kinase C substrate
3821015	1.36	LDLR	low density lipoprotein receptor
3442854	1.36	SLC2A3	solute carrier family 2 (facilitated glucose transporter), member 3
3127584	1.36	EGR3	early growth response 3
2735409	1.36	HERC5	hect domain and RLD 5
2905169	1.36	CDKN1A	cyclin-dependent kinase inhibitor 1A (p21, Cip1)
2612371	1.36	EAF1	ELL associated factor 1
3816509	1.36	GADD45B	growth arrest and DNA-damage-inducible, beta
3458587	1.36	DDIT3	DNA-damage-inducible transcript 3
3320819	1.36	MICALCL	MICAL C-terminal like
2409104	1.35	SLC2A1	solute carrier family 2 (facilitated glucose transporter), member 1
2340350	1.35	DNAJC6	DnaJ (Hsp40) homolog, subfamily C, member 6
2948239	1.35	TRIM10	tripartite motif-containing 10
4050485	1.35	TUBB2C	tubulin, beta 2C

3866276	1.35	SLC1A5	solute carrier family 1 (neutral amino acid transporter), member 5
3936330	1.35	C22orf37	chromosome 22 open reading frame 37
3124537	1.34	CTSB	cathepsin B
2766788	1.34	RBM47	RNA binding motif protein 47
3942472	1.34	TCN2	transcobalamin II
3233605	1.34	PFKFB3	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3
3088983	1.34	XPO7	exportin 7
3349918	1.34	RBM7	RNA binding motif protein 7
3190190	1.34	LCN2	lipocalin 2
3955327	1.34	C22orf13	chromosome 22 open reading frame 13
2929127	1.34	STX11	syntaxin 11
2773387	1.34	CXCL3	chemokine (C-X-C motif) ligand 3
3907190	1.33	SLPI	secretory leukocyte peptidase inhibitor
3714177	1.33	SPECC1	sperm antigen with calponin homology and coiled-coil domains 1
2647109	1.33	CPA3	carboxypeptidase A3 (mast cell)
2835792	1.33	GM2A	GM2 ganglioside activator
2787902	1.33	GYPE	glycophorin E (MNS blood group)
3822216	1.33	IER2	immediate early response 2
2565119	1.33	DUSP2	dual specificity phosphatase 2
3724545	1.33	ITGB3	integrin, beta 3 (platelet glycoprotein IIIa, antigen CD61)
3742285	1.33	CXCL16	chemokine (C-X-C motif) ligand 16
3374890	1.33	TCN1	transcobalamin I (vitamin B12 binding protein, R binder family)
3316208	1.33	TALDO1	transaldolase 1
2530713	1.33	CCL20	chemokine (C-C motif) ligand 20
3383227	1.33	GAB2	GRB2-associated binding protein 2
3263743	1.33	DUSP5	dual specificity phosphatase 5
3181976	1.33	NR4A3	nuclear receptor subfamily 4, group A, member 3
2870828	1.33	STARD4	StAR-related lipid transfer (START) domain containing 4
2634091	1.33	NFKBIZ	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, zeta
3251393	1.33	DDIT4	DNA-damage-inducible transcript 4
3250146	1.33	SRGN	serglycin
2488252	1.32	DYSF	dysferlin, limb girdle muscular dystrophy 2B (autosomal recessive)
3957003	1.32	ASCC2	activating signal cointegrator 1 complex subunit 2
2437736	1.32	RIT1	Ras-like without CAAX 1
3966000	1.32	TYMP	thymidine phosphorylase
3076178	1.32	MKRN1	makorin ring finger protein 1
3757329	1.32	JUP	junction plakoglobin

3076868	1.32	CLEC5A	C-type lectin domain family 5, member A
3591327	1.32	CCNDBP1	cyclin D-type binding-protein 1
3061484	1.32	HEPACAM2	HEPACAM family member 2
3764245	1.32	MPO	myeloperoxidase
2370926	1.32	NPL	N-acetylneuraminate pyruvate lyase (dihydrodipicolinate synthase)
2720145	1.32	LAP3	leucine aminopeptidase 3
3259978	1.32	PI4K2A	phosphatidylinositol 4-kinase type 2 alpha
2443417	1.32	SELP	selectin P (granule membrane protein 140kDa, antigen CD62)
2319802	1.32	PGD	phosphogluconate dehydrogenase
3735752	1.32	SEC14L1	SEC14-like 1 (<i>S. cerevisiae</i>)
3934111	1.32	SIK1	salt-inducible kinase 1
3823304	1.31	CYP4F3	cytochrome P450, family 4, subfamily F, polypeptide 3
3443183	1.31	CLEC4E	C-type lectin domain family 4, member E
3921068	1.31	ETS2	v-ets erythroblastosis virus E26 oncogene homolog 2 (avian)
2939213	1.31	TUBB2A	tubulin, beta 2A
3874636	1.31	SMOX	spermine oxidase
2330687	1.31	ZC3H12A	zinc finger CCCH-type containing 12A
3888613	1.31	CEBPB	CCAAT/enhancer binding protein (C/EBP), beta
2556302	1.31	PELI1	pellino homolog 1 (<i>Drosophila</i>)
2334191	1.31	PLK3	polo-like kinase 3
3579546	1.31	WARS	tryptophanyl-tRNA synthetase
3274361	1.31	KLF6	Kruppel-like factor 6
3822122	1.31	NFIX	nuclear factor I/X (CCAAT-binding transcription factor)
3638607	1.31	ANPEP	alanyl (membrane) aminopeptidase
3302240	1.31	RRP12	ribosomal RNA processing 12 homolog (<i>S. cerevisiae</i>)
2434124	1.31	HIST2H2BE	histone cluster 2, H2be
3669092	1.31	TERF2IP	telomeric repeat binding factor 2, interacting protein
2501204	1.30	IL1RN	interleukin 1 receptor antagonist
2699726	1.30	PLSCR1	phospholipid scramblase 1
3901041	1.30	THBD	thrombomodulin
3642687	1.30	HBQ1	hemoglobin, theta 1
3119945	1.30	GRINA	glutamate receptor, ionotropic, N-methyl D-aspartate-associated protein 1 (glutamate binding)
3028011	1.30	MGAM	maltase-glucoamylase (alpha-glucosidase)
3722681	1.30	C17orf88	chromosome 17 open reading frame 88
2608725	1.30	BHLHE40	basic helix-loop-helix family, member e40
3886765	1.30	PI3	peptidase inhibitor 3, skin-derived
2732844	1.30	ANXA3	annexin A3

3917305	1.30	BACH1	BTB and CNC homology 1, basic leucine zipper transcription factor 1
3556386	1.30	RAB2B	RAB2B, member RAS oncogene family
3834379	1.30	CEACAM6	carcinoembryonic antigen-related cell adhesion molecule 6 (non-specific cross reacting antigen)
3043264	1.30	JAZF1	JAZF zinc finger 1
3709153	1.30	TMEM88	transmembrane protein 88
3432438	1.30	OAS1	2',5'-oligoadenylate synthetase 1, 40/46kDa
3844855	1.30	C19orf22	chromosome 19 open reading frame 22
2873897	1.30	MARCH3	membrane-associated ring finger (C3HC4) 3
3815233	1.30	ELANE	elastase, neutrophil expressed
2700828	1.30	SIAH2	seven in absentia homolog 2 (Drosophila)
2469252	1.29	RRM2	ribonucleotide reductase M2
2406783	1.29	CSF3R	colony stimulating factor 3 receptor (granulocyte)
3846783	1.29	UBXN6	UBX domain protein 6
3442706	1.29	CD163	CD163 molecule
2974592	1.29	VNN1	vanin 1
2956502	1.29	RHAG	Rh-associated glycoprotein
2712632	1.29	TFRC	transferrin receptor (p90, CD71)
3753474	1.29	AMAC1	acyl-malonyl condensing enzyme 1
3456666	1.29	NFE2	nuclear factor (erythroid-derived 2), 45kDa
3358950	1.29	CTSD	cathepsin D
2485406	1.29	HSPC159	galectin-related protein
2957700	1.29	GCLC	glutamate-cysteine ligase, catalytic subunit
3890109	1.29	C20orf108	chromosome 20 open reading frame 108
3157660	1.29	TSTA3	tissue specific transplantation antigen P35B
3167325	1.28	UBAP1	ubiquitin associated protein 1
3895614	1.28	SIGLEC1	sialic acid binding Ig-like lectin 1, sialoadhesin
3204558	1.28	KIAA1539	KIAA1539
2340529	1.28	PDE4B	phosphodiesterase 4B, cAMP-specific
3873389	1.28	PSMF1	proteasome (prosome, macropain) inhibitor subunit 1 (PI31)
3099750	1.28	SDCBP	syndecan binding protein (syntenin)
3119339	1.28	LY6E	lymphocyte antigen 6 complex, locus E
2474977	1.28	FOSL2	FOS-like antigen 2
3740462	1.28	RILP	Rab interacting lysosomal protein
3839910	1.28	FPR2	formyl peptide receptor 2
4053534	1.28	ISG15	ISG15 ubiquitin-like modifier
3771037	1.28	WBP2	WW domain binding protein 2
3873629	1.28	SIRPA	signal-regulatory protein alpha
2702307	1.28	CCNL1	cyclin L1
2458649	1.27	C1orf55	chromosome 1 open reading frame 55
2496907	1.27	IL1R2	interleukin 1 receptor, type II
3178147	1.27	CTSL1	cathepsin L1

4054117	1.27	TAF13	TAF13 RNA polymerase II, TATA box binding protein (TBP)-associated factor, 18kDa
3945225	1.27	MAFF	v-maf musculoaponeurotic fibrosarcoma oncogene homolog F (avian)
2874920	1.27	ACSL6	acyl-CoA synthetase long-chain family member 6
2719656	1.27	CD38	CD38 molecule
3945396	1.27	GTPBP1	GTP binding protein 1
3203482	1.27	BAG1	BCL2-associated athanogene
2539125	1.27	CMPK2	cytidine monophosphate (UMP-CMP) kinase 2, mitochondrial
2359439	1.27	LCE1D	late cornified envelope 1D
2539607	1.27	MBOAT2	membrane bound O-acyltransferase domain containing 2
2709778	1.27	BCL6	B-cell CLL/lymphoma 6
2991150	1.27	TSPAN13	tetraspanin 13
3772279	1.27	SOCS3	suppressor of cytokine signaling 3
3866605	1.27	NAPA	N-ethylmaleimide-sensitive factor attachment protein, alpha
3851840	1.27	KLF1	Kruppel-like factor 1 (erythroid)
2451593	1.27	CHI3L1	chitinase 3-like 1 (cartilage glycoprotein-39)
3676165	1.27	HAGH	hydroxyacylglutathione hydrolase
3377988	1.26	FOSL1	FOS-like antigen 1
2971801	1.26	MAN1A1	mannosidase, alpha, class 1A, member 1
3851072	1.26	ACP5	acid phosphatase 5, tartrate resistant
3539070	1.26	HIF1A	hypoxia inducible factor 1, alpha subunit (basic helix-loop-helix transcription factor)
3375648	1.26	FTH1	ferritin, heavy polypeptide 1
2953481	1.26	TREML1	triggering receptor expressed on myeloid cells-like 1
3708074	1.26	XAF1	XIAP associated factor 1
2327659	1.26	OPRD1	opioid receptor, delta 1
3854877	1.26	JUND	jun D proto-oncogene
2905404	1.26	PIM1	pim-1 oncogene
3536706	1.26	LGALS3	lectin, galactoside-binding, soluble, 3
3457160	1.26	CD63	CD63 molecule
3291601	1.26	EGR2	early growth response 2
3037193	1.26	EIF2AK1	eukaryotic translation initiation factor 2-alpha kinase 1
3185498	1.26	SLC31A2	solute carrier family 31 (copper transporters), member 2
3933999	1.26	U2AF1	U2 small nuclear RNA auxiliary factor 1
2731381	1.26	CXCL1	chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)
3608398	1.26	FURIN	furin (paired basic amino acid cleaving enzyme)

2390102	1.26	C1orf150	chromosome 1 open reading frame 150
2475628	1.26	YPEL5	yippee-like 5 (Drosophila)
2370355	1.25	IER5	immediate early response 5
3883921	1.25	MYL9	myosin, light chain 9, regulatory
3219215	1.25	KLF4	Kruppel-like factor 4 (gut)
3883013	1.25	TP53INP2	tumor protein p53 inducible nuclear protein 2
2662491	1.25	TMEM111	transmembrane protein 111
2882098	1.25	SPARC	secreted protein, acidic, cysteine-rich (osteonectin)
2400655	1.25	RAP1GAP	RAP1 GTPase activating protein
3922037	1.25	MX2	myxovirus (influenza virus) resistance 2 (mouse)
3779579	1.25	TUBB6	tubulin, beta 6
3592484	1.25	PLDN	pallidin homolog (mouse)
3662851	1.25	GPR97	G protein-coupled receptor 97
3739431	1.25	METRNL	meteorin, glial cell differentiation regulator-like
2505404	1.25	MZT2B	mitotic spindle organizing protein 2B
2376894	1.25	DYRK3	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 3
3598165	1.25	PLEKHO2	pleckstrin homology domain containing, family O member 2
2900059	1.25	HIST1H2BM	histone cluster 1, H2bm
2341083	1.25	GADD45A	growth arrest and DNA-damage-inducible, alpha
2458082	1.25	WDR26	WD repeat domain 26
3507766	1.25	SLC7A1	solute carrier family 7 (cationic amino acid transporter, y+ system), member 1
3835726	1.25	BCL3	B-cell CLL/lymphoma 3
3769969	1.25	FAM104A	family with sequence similarity 104, member A
2548699	1.24	CYP1B1	cytochrome P450, family 1, subfamily B, polypeptide 1
3851055	1.24	ELOF1	elongation factor 1 homolog (S. cerevisiae)
2536996	1.24	FLJ41327	FLJ41327 protein
2613441	1.24	KAT2B	K(lysine) acetyltransferase 2B
3068097	1.24	DOCK4	dedicator of cytokinesis 4
2991233	1.24	AHR	aryl hydrocarbon receptor
3388751	1.24	MMP8	matrix metalloproteinase 8 (neutrophil collagenase)
3814978	1.24	CDC34	cell division cycle 34 homolog (S. cerevisiae)
2324097	1.24	PINK1	PTEN induced putative kinase 1
2548402	1.24	EIF2AK2	eukaryotic translation initiation factor 2-alpha kinase 2
2428501	1.24	SLC16A1	solute carrier family 16, member 1 (monocarboxylic acid transporter 1)

2777276	1.24	ABCG2	ATP-binding cassette, sub-family G (WHITE), member 2
3926080	1.24	BTG3	BTG family, member 3
3061438	1.24	SAMD9	sterile alpha motif domain containing 9
2992814	1.24	GPNUMB	glycoprotein (transmembrane) nmb
2862696	1.24	ENC1	ectodermal-neural cortex 1 (with BTB-like domain)
3721400	1.24	EIF1	eukaryotic translation initiation factor 1
3256074	1.24	BMPR1A	bone morphogenetic protein receptor, type IA
3738629	1.24	SLC16A3	solute carrier family 16, member 3 (monocarboxylic acid transporter 4)
3173673	1.24	PIP5K1B	phosphatidylinositol-4-phosphate 5-kinase, type I, beta
2911903	1.24	PTP4A1	protein tyrosine phosphatase type IVA, member 1
3638590	1.24	MESP1	mesoderm posterior 1 homolog (mouse)
3433466	1.24	NCRNA00173	non-protein coding RNA 173
3209726	1.24	ALDH1A1	aldehyde dehydrogenase 1 family, member A1
3722917	1.24	GRN	granulin
3186966	1.23	TLR4	toll-like receptor 4
2502686	1.23	MARCO	macrophage receptor with collagenous structure
2320619	1.23	MFN2	mitofusin 2
3095002	1.23	ADAM9	ADAM metallopeptidase domain 9
3067592	1.23	PNPLA8	patatin-like phospholipase domain containing 8
3500787	1.23	TNFSF13B	tumor necrosis factor (ligand) superfamily, member 13b
3722338	1.23	IFI35	interferon-induced protein 35
3299585	1.23	LIPA	lipase A, lysosomal acid, cholesterol esterase
2452049	1.23	PPP1R15B	protein phosphatase 1, regulatory (inhibitor) subunit 15B
3744150	1.23	PER1	period homolog 1 (Drosophila)
3325740	1.23	PRRG4	proline rich Gla (G-carboxyglutamic acid) 4 (transmembrane)
2883349	1.23	HAVCR2	hepatitis A virus cellular receptor 2
3589458	1.23	THBS1	thrombospondin 1
3415193	1.23	GRASP	GRP1 (general receptor for phosphoinositides 1)-associated scaffold protein
2438792	1.23	ETV3	ets variant 3
3740367	1.23	SLC43A2	solute carrier family 43, member 2
2477438	1.23	QPCT	glutaminy-peptide cyclotransferase
3400034	1.23	WNK1	WNK lysine deficient protein kinase 1
3824874	1.23	IFI30	interferon, gamma-inducible protein 30
2682271	1.23	PROK2	prokineticin 2
2867873	1.23	ELL2	elongation factor, RNA polymerase II, 2
2335986	1.23	RNF11	ring finger protein 11

3125001	1.23	LONRF1	LON peptidase N-terminal domain and ring finger 1
2963784	1.23	AKIRIN2	akirin 2
3389450	1.23	CARD16	caspase recruitment domain family, member 16
2618598	1.23	EIF1B	eukaryotic translation initiation factor 1B
3772661	1.23	TIMP2	TIMP metallopeptidase inhibitor 2
3674886	1.23	NPRL3	nitrogen permease regulator-like 3 (<i>S. cerevisiae</i>)
3462816	1.23	PHLDA1	pleckstrin homology-like domain, family A, member 1
3486956	1.23	C13orf15	chromosome 13 open reading frame 15
3069082	1.23	TFEC	transcription factor EC
3444043	1.23	OLR1	oxidized low density lipoprotein (lectin-like) receptor 1
3014229	1.22	BRI3	brain protein I3
3905145	1.22	TGM2	transglutaminase 2 (C polypeptide, protein-glutamine-gamma-glutamyltransferase)
2685304	1.22	PROS1	protein S (alpha)
2877465	1.22	ETF1	eukaryotic translation termination factor 1
3841076	1.22	MYADM	myeloid-associated differentiation marker
3529725	1.22	REC8	REC8 homolog (yeast)
3385175	1.22	PICALM	phosphatidylinositol binding clathrin assembly protein
3250278	1.22	HK1	hexokinase 1
3569200	1.22	ATP6V1D	ATPase, H ⁺ transporting, lysosomal 34kDa, V1 subunit D
3529701	1.22	IRF9	interferon regulatory factor 9
3373962	1.22	UBE2L6	ubiquitin-conjugating enzyme E2L 6
2409507	1.22	SLC6A9	solute carrier family 6 (neurotransmitter transporter, glycine), member 9
2377332	1.22	CR1	complement component (3b/4b) receptor 1 (Knops blood group)
2504328	1.22	GYPC	glycophorin C (Gerbich blood group)
3774418	1.22	MAFG	v-maf musculoaponeurotic fibrosarcoma oncogene homolog G (avian)
2540157	1.22	ODC1	ornithine decarboxylase 1
2830698	1.22	FAM53C	family with sequence similarity 53, member C
3061456	1.22	SAMD9L	sterile alpha motif domain containing 9-like
3863669	1.22	CEACAM1	carcinoembryonic antigen-related cell adhesion molecule 1 (biliary glycoprotein)
2434438	1.22	MCL1	myeloid cell leukemia sequence 1 (BCL2-related)
2908179	1.22	VEGFA	vascular endothelial growth factor A
3445544	1.22	PLBD1	phospholipase B domain containing 1
3708858	1.22	CD68	CD68 molecule
3455728	1.22	KRT1	keratin 1

3469687	1.22	CKAP4	cytoskeleton-associated protein 4
3019519	1.22	IFRD1	interferon-related developmental regulator 1
3772719	1.22	LGALS3BP	lectin, galactoside-binding, soluble, 3 binding protein
3330693	1.22	OR4C16	olfactory receptor, family 4, subfamily C, member 16
2395123	1.22	UTS2	urotensin 2
3402315	1.22	CD9	CD9 molecule
3743486	1.22	GABARAP	GABA(A) receptor-associated protein
3419147	1.21	USP15	ubiquitin specific peptidase 15
3226661	1.21	ZER1	zer-1 homolog (C. elegans)
2866704	1.21	ARRDC3	arrestin domain containing 3
2553282	1.21	PSME4	proteasome (prosome, macropain) activator subunit 4
3822074	1.21	RAD23A	RAD23 homolog A (S. cerevisiae)
2838201	1.21	PTTG1	pituitary tumor-transforming 1
3601511	1.21	ISLR	immunoglobulin superfamily containing leucine-rich repeat
2620813	1.21	CCR3	chemokine (C-C motif) receptor 3
2469213	1.21	KLF11	Kruppel-like factor 11
3862650	1.21	SERTAD3	SERTA domain containing 3
3960782	1.21	JOSD1	Josephin domain containing 1
3470549	1.21	CORO1C	coronin, actin binding protein, 1C
2950277	1.21	HLA-DMA	major histocompatibility complex, class II, DM alpha
2831519	1.21	C5orf32	chromosome 5 open reading frame 32
2411198	1.21	TAL1	T-cell acute lymphocytic leukemia 1
3188111	1.21	PTGS1	prostaglandin-endoperoxide synthase 1 (prostaglandin G/H synthase and cyclooxygenase)
2955076	1.21	NFKBIE	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, epsilon
3771773	1.21	JMJD6	jumonji domain containing 6
3841621	1.21	LILRB4	leukocyte immunoglobulin-like receptor, subfamily B (with TM and ITIM domains), member 4
3432514	1.21	OAS2	2'-5'-oligoadenylate synthetase 2, 69/71kDa
3920850	1.21	KCNJ15	potassium inwardly-rectifying channel, subfamily J, member 15
2486811	1.21	PLEK	pleckstrin
3240012	1.21	MASTL	microtubule associated serine/threonine kinase-like
3160895	1.21	JAK2	Janus kinase 2
3247757	1.21	UBE2D1	ubiquitin-conjugating enzyme E2D 1 (UBC4/5 homolog, yeast)
3525498	1.21	RAB20	RAB20, member RAS oncogene family
2492938	1.21	RPIA	ribose 5-phosphate isomerase A

2956563	1.21	CRISP3	cysteine-rich secretory protein 3
2476510	1.21	LTBP1	latent transforming growth factor beta binding protein 1
2946225	1.21	HIST1H2BB	histone cluster 1, H2bb
3894727	1.21	SIRPB1	signal-regulatory protein beta 1
3538555	1.21	PPM1A	protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1A
3415229	1.20	NR4A1	nuclear receptor subfamily 4, group A, member 1
3683037	1.20	ARL6IP1	ADP-ribosylation factor-like 6 interacting protein 1
3891342	1.20	TUBB1	tubulin, beta 1
2694314	1.20	GATA2	GATA binding protein 2
2420427	1.20	GNG5	guanine nucleotide binding protein (G protein), gamma 5
3333711	1.20	SLC3A2	solute carrier family 3 (activators of dibasic and neutral amino acid transport), member 2
3035135	1.20	ZFAND2A	zinc finger, AN1-type domain 2A
3406589	1.20	MGST1	microsomal glutathione S-transferase 1
3937130	1.20	C22orf25	chromosome 22 open reading frame 25
3756591	1.20	KRT23	keratin 23 (histone deacetylase inducible)
2377229	1.20	CD55	CD55 molecule, decay accelerating factor for complement (Cromer blood group)
3527722	1.20	RNASE2	ribonuclease, RNase A family, 2 (liver, eosinophil-derived neurotoxin)
3727712	1.20	PCTP	phosphatidylcholine transfer protein
2366422	1.20	ATP1B1	ATPase, Na ⁺ /K ⁺ transporting, beta 1 polypeptide
3683276	1.20	GDE1	glycerophosphodiester phosphodiesterase 1
2717049	1.20	MRFAP1	Mof4 family associated protein 1
2881554	1.20	DCTN4	dynactin 4 (p62)
3893760	1.20	TPD52L2	tumor protein D52-like 2
3881391	1.20	ID1	inhibitor of DNA binding 1, dominant negative helix-loop-helix protein
3944084	1.20	TOM1	target of myb1 (chicken)
3923075	1.20	CRYAA	crystallin, alpha A
3016316	1.20	EMID2	EMI domain containing 2
3375091	1.20	SLC15A3	solute carrier family 15, member 3
3874751	1.20	PRNP	prion protein
3590341	1.20	CHP	calcium binding protein P22
3332015	1.20	OR4D10	olfactory receptor, family 4, subfamily D, member 10
3830412	1.20	FFAR1	free fatty acid receptor 1
2611546	1.20	FBLN2	fibulin 2
3789947	1.20	NEDD4L	neural precursor cell expressed, developmentally down-regulated 4-like

2803329	1.20	BASP1	brain abundant, membrane attached signal protein 1
3558347	1.20	CTSG	cathepsin G
3887117	1.20	CTSA	cathepsin A
3553531	1.20	TNFAIP2	tumor necrosis factor, alpha-induced protein 2
2422035	1.20	GBP5	guanylate binding protein 5
3908963	1.20	B4GALT5	UDP-Gal:betaGlcNAc beta 1,4-galactosyltransferase, polypeptide 5
3645555	1.20	TNFRSF12A	tumor necrosis factor receptor superfamily, member 12A
2705748	1.20	NCEH1	neutral cholesterol ester hydrolase 1
2324416	1.20	ALPL	alkaline phosphatase, liver/bone/kidney
3718930	1.20	CCL4	chemokine (C-C motif) ligand 4
3620276	1.20	EHD4	EH-domain containing 4
3723348	1.20	HEXIM1	hexamethylene bis-acetamide inducible 1
3645601	1.20	MMP25	matrix metalloproteinase 25
3405748	1.20	EMP1	epithelial membrane protein 1
3816815	1.20	GNA15	guanine nucleotide binding protein (G protein), alpha 15 (Gq class)
3442785	1.20	CLEC4C	C-type lectin domain family 4, member C
3818860	1.20	MCOLN1	mucolipin 1
3042001	1.20	CYCS	cytochrome c, somatic
3077168	1.20	KEL	Kell blood group, metallo-endopeptidase
2931569	1.19	AKAP12	A kinase (PRKA) anchor protein 12
3227121	1.19	C9orf78	chromosome 9 open reading frame 78
3187686	1.19	GSN	gelsolin
3763270	1.19	MMD	monocyte to macrophage differentiation-associated
2343289	1.19	DNAJB4	DnaJ (Hsp40) homolog, subfamily B, member 4
2622239	1.19	RNF123	ring finger protein 123
2559619	1.19	NAT8	N-acetyltransferase 8 (GCN5-related, putative)
3553607	1.19	EIF5	eukaryotic translation initiation factor 5
3762355	1.19	LRRC59	leucine rich repeat containing 59
2370019	1.19	QSOX1	quiescin Q6 sulfhydryl oxidase 1
3453837	1.19	TUBA1A	tubulin, alpha 1a
3257268	1.19	IFIT5	interferon-induced protein with tetratricopeptide repeats 5
3936550	1.19	USP18	ubiquitin specific peptidase 18
2830946	1.19	CTNNA1	catenin (cadherin-associated protein), alpha 1, 102kDa
2827185	1.19	LMNB1	lamin B1
2818517	1.19	VCAN	versican
2786322	1.19	SLC7A11	solute carrier family 7, (cationic amino acid transporter, y+ system) member 11
3819104	1.19	TRAPPC5	trafficking protein particle complex 5

3846831	1.19	LRG1	leucine-rich alpha-2-glycoprotein 1
4041113	1.19	KPNA2	karyopherin alpha 2 (RAG cohort 1, importin alpha 1)
3240987	1.19	MAP3K8	mitogen-activated protein kinase kinase kinase 8
2324873	1.19	C1QC	complement component 1, q subcomponent, C chain
3672489	1.19	IRF8	interferon regulatory factor 8
2719617	1.19	BST1	bone marrow stromal cell antigen 1
2946383	1.19	HIST1H4H	histone cluster 1, H4h
2619761	1.19	ABHD5	abhydrolase domain containing 5
3127579	1.19	BIN3	bridging integrator 3
3358174	1.19	IRF7	interferon regulatory factor 7
2623922	1.19	STAB1	stabilin 1
3823583	1.19	HSH2D	hematopoietic SH2 domain containing
2943874	1.19	KIF13A	kinesin family member 13A
2454378	1.19	SLC30A1	solute carrier family 30 (zinc transporter), member 1
3228545	1.19	OBP2B	odorant binding protein 2B
2962820	1.19	ME1	malic enzyme 1, NADP(+)-dependent, cytosolic
2745547	1.19	GAB1	GRB2-associated binding protein 1
2484841	1.19	B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2
2511603	1.19	GALNT5	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylglucosaminyltransferase 5 (GalNAc-T5)
3852022	1.19	LYL1	lymphoblastic leukemia derived sequence 1
2520533	1.19	OBFC2A	oligonucleotide/oligosaccharide-binding fold containing 2A
3850445	1.19	CDKN2D	cyclin-dependent kinase inhibitor 2D (p19, inhibits CDK4)
3887210	1.18	MMP9	matrix metalloproteinase 9 (gelatinase B, 92kDa gelatinase, 92kDa type IV collagenase)
2902804	1.18	C2	complement component 2
2992576	1.18	IL6	interleukin 6 (interferon, beta 2)
2829275	1.18	UBE2B	ubiquitin-conjugating enzyme E2B (RAD6 homolog)
3437500	1.18	GLT1D1	glycosyltransferase 1 domain containing 1
3178545	1.18	S1PR3	sphingosine-1-phosphate receptor 3
2678090	1.18	ARF4	ADP-ribosylation factor 4
3261255	1.18	DPCD	deleted in primary ciliary dyskinesia homolog (mouse)
2946345	1.18	HIST1H2BG	histone cluster 1, H2bg
2919669	1.18	PRDM1	PR domain containing 1, with ZNF domain

2547751	1.18	MYADML	myeloid-associated differentiation marker-like
3374061	1.18	YPEL4	yippee-like 4 (Drosophila)
3962530	1.18	CYB5R3	cytochrome b5 reductase 3
3870570	1.18	MBOAT7	membrane bound O-acyltransferase domain containing 7
3571904	1.18	NPC2	Niemann-Pick disease, type C2
3564210	1.18	PYGL	phosphorylase, glycogen, liver
2454444	1.18	NEK2	NIMA (never in mitosis gene a)-related kinase 2
3671935	1.18	CRISPLD2	cysteine-rich secretory protein LCCL domain containing 2
2571075	1.18	ANAPC1	anaphase promoting complex subunit 1
3774906	1.18	SECTM1	secreted and transmembrane 1
3114618	1.18	RNF139	ring finger protein 139
3796335	1.18	LPIN2	lipin 2
2899090	1.18	HIST1H3A	histone cluster 1, H3a
2748346	1.18	TLR2	toll-like receptor 2
3362159	1.18	NRIP3	nuclear receptor interacting protein 3
3544562	1.18	JDP2	Jun dimerization protein 2
3270270	1.18	PTPRE	protein tyrosine phosphatase, receptor type, E
2835166	1.18	ARHGEF37	Rho guanine nucleotide exchange factor (GEF) 37
3851776	1.18	PRDX2	peroxiredoxin 2
3834405	1.18	CEACAM3	carcinoembryonic antigen-related cell adhesion molecule 3
3841777	1.18	KIR3DL1	killer cell immunoglobulin-like receptor, three domains, long cytoplasmic tail, 1
2514304	1.18	DHRS9	dehydrogenase/reductase (SDR family) member 9
2598261	1.18	FN1	fibronectin 1
2707876	1.18	LAMP3	lysosomal-associated membrane protein 3
3129065	1.18	CLU	clusterin
3105600	1.18	CA2	carbonic anhydrase II
3557811	1.18	PSME2	proteasome (prosome, macropain) activator subunit 2 (PA28 beta)
3160500	1.18	GLIS3	GLIS family zinc finger 3
3218528	1.18	ABCA1	ATP-binding cassette, sub-family A (ABC1), member 1
3882069	1.18	MAPRE1	microtubule-associated protein, RP/EB family, member 1
3872983	1.18	CHMP2A	chromatin modifying protein 2A
2949330	1.18	CLIC1	chloride intracellular channel 1
2711610	1.18	LRRC15	leucine rich repeat containing 15
3860137	1.18	TYROBP	TYRO protein tyrosine kinase binding protein
2848265	1.17	CMBL	carboxymethylenebutenolidase homolog (Pseudomonas)
2651828	1.17	SEC62	SEC62 homolog (S. cerevisiae)

3210013	1.17	TRPM6	transient receptor potential cation channel, subfamily M, member 6
3356115	1.17	APLP2	amyloid beta (A4) precursor-like protein 2
3493543	1.17	KLF5	Kruppel-like factor 5 (intestinal)
3215570	1.17	FBP1	fructose-1,6-bisphosphatase 1
3291151	1.17	RHOBTB1	Rho-related BTB domain containing 1
3340665	1.17	DGAT2	diacylglycerol O-acyltransferase 2
3000984	1.17	ABCA13	ATP-binding cassette, sub-family A (ABC1), member 13
3308489	1.17	KIAA1598	KIAA1598
2747961	1.17	FHDC1	FH2 domain containing 1
2946714	1.17	HIST1H2BK	histone cluster 1, H2bk
2375664	1.17	BTG2	BTG family, member 2
2522094	1.17	SPATS2L	spermatogenesis associated, serine-rich 2-like
3771642	1.17	CYGB	cytoglobin
3569257	1.17	PLEK2	pleckstrin 2
3629206	1.17	OAZ2	ornithine decarboxylase antizyme 2
2423907	1.17	F3	coagulation factor III (thromboplastin, tissue factor)
3098213	1.17	NPBWR1	neuropeptides B/W receptor 1
3858285	1.17	TSHZ3	teashirt zinc finger homeobox 3
2417390	1.17	WLS	wntless homolog (Drosophila)
3603840	1.17	ST20	suppressor of tumorigenicity 20
3250055	1.17	DDX21	DEAD (Asp-Glu-Ala-Asp) box polypeptide 21
3832760	1.17	NFKBIB	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, beta
3503816	1.17	TPTE2	transmembrane phosphoinositide 3-phosphatase and tensin homolog 2
2790368	1.17	SFRP2	secreted frizzled-related protein 2
3815210	1.17	AZU1	azurocidin 1
2946215	1.17	HIST1H3B	histone cluster 1, H3b
2832081	1.17	ZMAT2	zinc finger, matrin-type 2
2591837	1.17	SLC40A1	solute carrier family 40 (iron-regulated transporter), member 1
2925871	1.17	ENPP3	ectonucleotide pyrophosphatase/phosphodiesterase 3
2993727	1.17	SNX10	sorting nexin 10
3901387	1.17	CST2	cystatin SA
3934407	1.17	ICOSLG	inducible T-cell co-stimulator ligand
2571483	1.17	IL1A	interleukin 1, alpha
3009472	1.17	DTX2	deltex homolog 2 (Drosophila)
3886223	1.17	MYBL2	v-myb myeloblastosis viral oncogene homolog (avian)-like 2
2438531	1.17	HDGF	hepatoma-derived growth factor
3837269	1.17	GPR77	G protein-coupled receptor 77
3428671	1.17	CHPT1	choline phosphotransferase 1

3944243	1.17	APOL6	apolipoprotein L, 6
3318517	1.17	OR52N2	olfactory receptor, family 52, subfamily N, member 2
2325593	1.16	CLIC4	chloride intracellular channel 4
2848464	1.16	DAP	death-associated protein
3490892	1.16	OLFM4	olfactomedin 4
3025740	1.16	TMEM140	transmembrane protein 140
2995254	1.16	C7orf41	chromosome 7 open reading frame 41
2949471	1.16	NEU1	sialidase 1 (lysosomal sialidase)
2759404	1.16	GRPEL1	GrpE-like 1, mitochondrial (E. coli)
2902609	1.16	C6orf25	chromosome 6 open reading frame 25
3657041	1.16	ITGAX	integrin, alpha X (complement component 3 receptor 4 subunit)
3219621	1.16	CTNNAL1	catenin (cadherin-associated protein), alpha-like 1
3581386	1.16	CDCA4	cell division cycle associated 4
3741528	1.16	TAX1BP3	Tax1 (human T-cell leukemia virus type I) binding protein 3
2504743	1.16	LIMS2	LIM and senescent cell antigen-like domains 2
2904000	1.16	HMGA1	high mobility group AT-hook 1
2447414	1.16	NCF2	neutrophil cytosolic factor 2
3409605	1.16	FAR2	fatty acyl CoA reductase 2
2528093	1.16	CYP27A1	cytochrome P450, family 27, subfamily A, polypeptide 1
2706938	1.16	GNB4	guanine nucleotide binding protein (G protein), beta polypeptide 4
3623424	1.16	COPS2	COP9 constitutive photomorphogenic homolog subunit 2 (Arabidopsis)
2406245	1.16	PSMB2	proteasome (prosome, macropain) subunit, beta type, 2
2974610	1.16	VNN3	vanin 3
3333443	1.16	ASRGL1	asparaginase like 1
3819820	1.16	OR2Z1	olfactory receptor, family 2, subfamily Z, member 1
3472389	1.16	LHX5	LIM homeobox 5
3728889	1.16	VMP1	vacuole membrane protein 1
2974635	1.16	VNN2	vanin 2
2749699	1.16	RAPGEF2	Rap guanine nucleotide exchange factor (GEF) 2
3302495	1.16	AVPI1	arginine vasopressin-induced 1
3661718	1.16	LPCAT2	lysophosphatidylcholine acyltransferase 2
2905432	1.16	TBC1D22B	TBC1 domain family, member 22B
2914693	1.16	SH3BGRL2	SH3 domain binding glutamic acid-rich protein like 2
3054165	1.16	SBDS	Shwachman-Bodian-Diamond syndrome
3941793	1.16	KREMEN1	kringle containing transmembrane protein 1

3716411	1.16	CPD	carboxypeptidase D
3104698	1.16	ZBTB10	zinc finger and BTB domain containing 10
3444009	1.16	CLEC7A	C-type lectin domain family 7, member A
3416019	1.16	PRR13	proline rich 13
3802980	1.16	DSC2	desmocollin 2
2658595	1.16	HES1	hairy and enhancer of split 1, (Drosophila)
2711034	1.16	MB21D2	chromosome 3 open reading frame 59
2585167	1.16	GALNT3	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 3 (GalNAc-T3)
3259253	1.16	ENTPD1	ectonucleoside triphosphate diphosphohydrolase 1
2596763	1.16	FZD5	frizzled homolog 5 (Drosophila)
2489545	1.16	HK2	hexokinase 2
2559558	1.16	EGR4	early growth response 4
2518155	1.16	UBE2E3	ubiquitin-conjugating enzyme E2E 3 (UBC4/5 homolog, yeast)
2452615	1.16	SLC45A3	solute carrier family 45, member 3
2899102	1.16	HIST1H3C	histone cluster 1, H3c
3439732	1.16	NINJ2	ninjurin 2
3237788	1.16	PLXDC2	plexin domain containing 2
3322775	1.16	LDHA	lactate dehydrogenase A
2995589	1.16	AQP1	aquaporin 1 (Colton blood group)
3209623	1.16	ZFAND5	zinc finger, AN1-type domain 5
2699564	1.16	PLOD2	procollagen-lysine, 2-oxoglutarate 5-dioxygenase 2
3189580	1.16	ZBTB43	zinc finger and BTB domain containing 43
2362333	1.16	MNDA	myeloid cell nuclear differentiation antigen
3635198	1.16	BCL2A1	BCL2-related protein A1
2871801	1.16	FEM1C	fem-1 homolog c (C. elegans)
3118651	1.16	DENND3	DENN/MADD domain containing 3
2320374	1.16	FBXO6	F-box protein 6
3656990	1.16	ITGAM	integrin, alpha M (complement component 3 receptor 3 subunit)
3525234	1.16	IRS2	insulin receptor substrate 2
3815243	1.16	CFD	complement factor D (adipsin)
3907400	1.16	WFDC10B	WAP four-disulfide core domain 10B
3257670	1.16	PCGF5	polycomb group ring finger 5
3204610	1.16	UNC13B	unc-13 homolog B (C. elegans)
2698565	1.16	TFDP2	transcription factor Dp-2 (E2F dimerization partner 2)
2621574	1.15	CAMP	cathelicidin antimicrobial peptide
3224336	1.15	OR1B1	olfactory receptor, family 1, subfamily B, member 1
2636589	1.15	ATP6V1A	ATPase, H ⁺ transporting, lysosomal 70kDa, V1 subunit A

2960903	1.15	EEF1A1	eukaryotic translation elongation factor 1 alpha 1
3402935	1.15	TPI1	triosephosphate isomerase 1
3529547	1.15	DCAF11	DDB1 and CUL4 associated factor 11
3064158	1.15	TFR2	transferrin receptor 2
2844479	1.15	SQSTM1	sequestosome 1
2404344	1.15	NKAIN1	Na ⁺ /K ⁺ transporting ATPase interacting 1
3473436	1.15	TESC	tescalcin
3368707	1.15	CD59	CD59 molecule, complement regulatory protein
3820161	1.15	UBL5	ubiquitin-like 5
2446244	1.15	TOR1AIP1	torsin A interacting protein 1
3901085	1.15	LOC200261	hypothetical LOC200261
3631214	1.15	TLE3	transducin-like enhancer of split 3 (E(sp1) homolog, Drosophila)
3060332	1.15	STEAP4	STEAP family member 4
3678369	1.15	ROGDI	rogdi homolog (Drosophila)
3193339	1.15	RXRA	retinoid X receptor, alpha
2999544	1.15	BLVRA	biliverdin reductase A
2962383	1.15	FAM46A	family with sequence similarity 46, member A
3725779	1.15	KAT7	K(lysine) acetyltransferase 7
2732942	1.15	BMP2K	BMP2 inducible kinase
3209384	1.15	TMEM2	transmembrane protein 2
3942838	1.15	LIMK2	LIM domain kinase 2
2663295	1.15	TMEM40	transmembrane protein 40
3521174	1.15	ABCC4	ATP-binding cassette, sub-family C (CFTR/MRP), member 4
3871242	1.15	TMEM86B	transmembrane protein 86B
3227070	1.15	PTGES	prostaglandin E synthase
2322226	1.15	CLCNKA	chloride channel Ka
2323899	1.15	UBXN10	UBX domain protein 10
3951493	1.15	CCT8L2	chaperonin containing TCP1, subunit 8 (theta)-like 2
3902372	1.15	FLJ45832	FLJ45832 protein
2629345	1.15	GPR27	G protein-coupled receptor 27

Supplemental Table 3. Genes up-regulated in *HbSS* subjects by 1.15 fold at FDR 0.05. Genes colored in red are known HIF-1 α targets.

AffyID	Fold Change	Gene Symbol	Gene Annotation
3031517	2.15	GIMAP7	GTPase, IMAP family member 7
2781138	1.86	LEF1	lymphoid enhancer-binding factor 1
3451814	1.84	NELL2	NEL-like 2 (chicken)
2464484	1.70	FAM36A	family with sequence similarity 36, member A
3393744	1.69	CD3D	CD3d molecule, delta (CD3-TCR complex)
3756319	1.65	CCR7	chemokine (C-C motif) receptor 7
3351300	1.63	CD3G	CD3g molecule, gamma (CD3-TCR complex)
2427791	1.63	DENND2D	DENN/MADD domain containing 2D
2806468	1.63	IL7R	interleukin 7 receptor
2823880	1.62	CAMK4	calcium/calmodulin-dependent protein kinase IV
2515627	1.57	ITGA6	integrin, alpha 6
3727928	1.56	NOG	noggin
3935486	1.56	S100B	S100 calcium binding protein B
3027956	1.54	TAS2R4	taste receptor, type 2, member 4
3617458	1.52	GOLGA8A	golgin A8 family, member A
2496536	1.51	RPL31	ribosomal protein L31
2566414	1.51	MGAT4A	mannosyl (alpha-1,3-)-glycoprotein beta-1,4-N-acetylglucosaminyltransferase, isozyme A
2837232	1.50	ITK	IL2-inducible T-cell kinase
2741236	1.50	USP53	ubiquitin specific peptidase 53
2948169	1.50	HCG8	HLA complex group 8
3404030	1.50	KLRG1	killer cell lectin-like receptor subfamily G, member 1
2831591	1.48	C5orf53	chromosome 5 open reading frame 53
2829171	1.48	TCF7	transcription factor 7 (T-cell specific, HMG-box)
3446868	1.48	LDHB	lactate dehydrogenase B
3351280	1.48	CD3E	CD3e molecule, epsilon (CD3-TCR complex)
3444086	1.47	KLRC4-KLRK1	killer cell lectin-like receptor subfamily K, member 1 -killer cell lectin-like receptor subfamily C, member 4
3450861	1.47	ABCD2	ATP-binding cassette, sub-family D (ALD), member 2
2862841	1.47	GCNT4	glucosaminyl (N-acetyl) transferase 4, core 2
2612625	1.46	OXNAD1	oxidoreductase NAD-binding domain containing 1
2389062	1.46	FAM36A	family with sequence similarity 36, member A
3666146	1.45	SLC7A6	solute carrier family 7 (cationic amino acid transporter, y+ system), member 6
3402506	1.45	CD27	CD27 molecule
2353669	1.45	CD2	CD2 molecule
2756404	1.45	ZNF721	zinc finger protein 721
3456955	1.45	KIAA0748	KIAA0748

3022841	1.44	METTL2B	methyltransferase like 2B
2768354	1.44	TXK	TXK tyrosine kinase
3347658	1.44	ATM	ataxia telangiectasia mutated
3576704	1.44	TC2N	tandem C2 domains, nuclear
2325479	1.44	RCAN3	RCAN family member 3
2349129	1.43	S1PR1	sphingosine-1-phosphate receptor 1
2458513	1.43	TMEM63A	transmembrane protein 63A
3831260	1.43	ZNF146	zinc finger protein 146
3226287	1.43	FAM102A	family with sequence similarity 102, member A
3138464	1.42	PDE7A	phosphodiesterase 7A
3387708	1.42	MAML2	MAML2 mastermind-like 2 (Drosophila)
3041260	1.42	TOMM7	translocase of outer mitochondrial membrane 7 homolog (yeast)
2378121	1.41	TRAF3IP3	TRAF3 interacting protein 3
2525852	1.41	RPE	ribulose-5-phosphate-3-epimerase
3404436	1.41	CLEC2D	C-type lectin domain family 2, member D
2440943	1.41	FCGR3A	Fc fragment of IgG, low affinity IIIa, receptor (CD16a)
2440258	1.41	SLAMF6	SLAM family member 6
3563317	1.40	RPS29	ribosomal protein S29
3535752	1.40	PTGDR	prostaglandin D2 receptor (DP)
3079103	1.40	GIMAP6	GTPase, IMAP family member 6
2654306	1.39	TTC14	tetratricopeptide repeat domain 14
3430125	1.39	TCP11L2	t-complex 11 (mouse)-like 2
2665199	1.39	SATB1	SATB homeobox 1
2635741	1.39	CD96	CD96 molecule
2902736	1.39	C6orf48	chromosome 6 open reading frame 48
3522398	1.38	DOCK9	dedicator of cytokinesis 9
3444117	1.38	KLRC3	killer cell lectin-like receptor subfamily C, member 3
3268274	1.38	PLEKHA1	pleckstrin homology domain containing, family A (phosphoinositide binding specific) member 1
3279108	1.38	NMT2	N-myristoyltransferase 2
2562965	1.38	CD8B	CD8b molecule
3314040	1.38	BNIP3	BCL2/adenovirus E1B 19kDa interacting protein 3
2977265	1.38	HIVP2	human immunodeficiency virus type I enhancer binding protein 2
2558150	1.38	AAK1	AP2 associated kinase 1
2339139	1.38	INADL	InaD-like (Drosophila)
3806905	1.37	SMAD2	SMAD family member 2
2464005	1.37	AKT3	v-akt murine thymoma viral oncogene homolog 3 (protein kinase B, gamma)
2635349	1.37	TRAT1	T cell receptor associated transmembrane adaptor 1

2482505	1.37	SPTBN1	spectrin, beta, non-erythrocytic 1
3726772	1.37	LUC7L3	LUC7-like 3 (<i>S. cerevisiae</i>)
2864449	1.37	SERINC5	serine incorporator 5
3618736	1.37	RASGRP1	RAS guanyl releasing protein 1 (calcium and DAG-regulated)
2831932	1.37	IK	IK cytokine, down-regulator of HLA II
2348792	1.37	CCDC76	coiled-coil domain containing 76
2809793	1.37	GZMK	granzyme K (granzyme 3; tryptase II)
3417075	1.36	DGKA	diacylglycerol kinase, alpha 80kDa
3321512	1.36	PDE3B	phosphodiesterase 3B, cGMP-inhibited
2656837	1.36	ST6GAL1	ST6 beta-galactosamide alpha-2,6-sialyltransferase 1
3528646	1.36	TRAV8-3	T cell receptor alpha variable 8-3
3362934	1.36	ZBED5	zinc finger, BED-type containing 5
3957790	1.36	PIK3IP1	phosphoinositide-3-kinase interacting protein 1
2945741	1.36	FAM65B	family with sequence similarity 65, member B
3894601	1.36	FKBP1A	FK506 binding protein 1A, 12kDa
2857416	1.36	IL6ST	interleukin 6 signal transducer (gp130, oncostatin M receptor)
3226253	1.36	FAM102A	family with sequence similarity 102, member A
3930525	1.36	RUNX1	chromosome 21 open reading frame 96
3885537	1.35	PLCG1	phospholipase C, gamma 1
2475678	1.35	LBH	limb bud and heart development homolog (mouse)
3390067	1.35	NPAT	nuclear protein, ataxia-telangiectasia locus
3486883	1.35	NAA16	N(alpha)-acetyltransferase 16, NatA auxiliary subunit
3889419	1.35	TSHZ2	teashirt zinc finger homeobox 2
2452977	1.35	FAIM3	Fas apoptotic inhibitory molecule 3
2326018	1.35	LDLRAP1	low density lipoprotein receptor adaptor protein 1
3544251	1.35	YLPM1	YLP motif containing 1
2565935	1.35	ANKRD36B	ankyrin repeat domain 36B
3285926	1.35	ZNF33B	zinc finger protein 33B
3826041	1.35	ZNF253	zinc finger protein 253
2360206	1.35	ATP8B2	ATPase, class I, type 8B, member 2
2349402	1.34	AMY2B	amylase, alpha 2B (pancreatic)
3031466	1.34	GIMAP8	GTPase, IMAP family member 8
3840372	1.34	ZNF701	zinc finger protein 701
2837266	1.34	CYFIP2	cytoplasmic FMR1 interacting protein 2
3761164	1.34	SKAP1	src kinase associated phosphoprotein 1
2363248	1.34	LY9	lymphocyte antigen 9
3444472	1.34	TAS2R50	taste receptor, type 2, member 50
3869650	1.34	ZNF83	zinc finger protein 83
2326463	1.34	CD52	CD52 molecule
2663083	1.34	C3orf31	chromosome 3 open reading frame 31

3862167	1.34	FBL	fibrillarin
2817941	1.34	RASGRF2	Ras protein-specific guanine nucleotide-releasing factor 2
2679014	1.33	FHIT	fragile histidine triad
2558511	1.33	TIA1	TIA1 cytotoxic granule-associated RNA binding protein
3089853	1.33	CHMP7	CHMP family, member 7
2437753	1.33	KIAA0907	KIAA0907
2787459	1.33	INPP4B	inositol polyphosphate-4-phosphatase, type II, 105kDa
2523801	1.33	CD28	CD28 molecule
2770193	1.33	AASDH	aminoadipate-semialdehyde dehydrogenase
3444493	1.33	TAS2R19	taste receptor, type 2, member 19
2328841	1.33	LCK	lymphocyte-specific protein tyrosine kinase
3092276	1.33	LEPROTL1	leptin receptor overlapping transcript-like 1
3444476	1.33	TAS2R20	taste receptor, type 2, member 20
2773907	1.33	SDAD1	SDA1 domain containing 1
3924783	1.32	PRMT2	protein arginine methyltransferase 2
2457573	1.32	MIA3	melanoma inhibitory activity family, member 3
3568080	1.32	WDR89	WD repeat domain 89
3755862	1.32	IKZF3	IKAROS family zinc finger 3 (Aiolos)
2619344	1.32	NKTR	natural killer-tumor recognition sequence
3315607	1.32	ATHL1	ATH1, acid trehalase-like 1 (yeast)
3136129	1.32	RPS20	ribosomal protein S20
3661065	1.32	RBL2	retinoblastoma-like 2 (p130)
2951916	1.32	STK38	serine/threonine kinase 38
2365933	1.32	RCSD1	RCSD domain containing 1
2961300	1.32	COX7A2	cytochrome c oxidase subunit VIIa polypeptide 2 (liver)
2488114	1.32	ZNF638	zinc finger protein 638
2688605	1.32	GCET2	germinal center expressed transcript 2
3768969	1.32	ABCA5	ATP-binding cassette, sub-family A (ABC1), member 5
2713950	1.32	ZNF141	zinc finger protein 141
3444525	1.32	TAS2R46	taste receptor, type 2, member 46
2355591	1.32	PDE4DIP	phosphodiesterase 4D interacting protein
3517793	1.31	KLF12	Kruppel-like factor 12
2622359	1.31	RBM6	RNA binding motif protein 6
3408573	1.31	LYRM5	LYR motif containing 5
3910260	1.31	ZNF217	zinc finger protein 217
2349345	1.31	RNPC3	RNA-binding region (RNP1, RRM) containing 3
3585905	1.31	APBA2	amyloid beta (A4) precursor protein-binding, family A, member 2
2526759	1.31	ATIC	5-aminoimidazole-4-carboxamide ribonucleotide formyltransferase/IMP cyclohydrolase

3027943	1.31	TAS2R3	taste receptor, type 2, member 3
3445768	1.31	ERP27	endoplasmic reticulum protein 27
2614120	1.31	RPL15	ribosomal protein L15
3001479	1.31	IKZF1	IKAROS family zinc finger 1 (Ikaros)
3849773	1.31	ZNF121	zinc finger protein 121
3031556	1.31	GIMAP2	GTPase, IMAP family member 2
3518169	1.31	COMMD6	COMM domain containing 6
3918959	1.30	MRPS6	mitochondrial ribosomal protein S6
2973856	1.30	SAMD3	sterile alpha motif domain containing 3
3508330	1.30	HSPH1	heat shock 105kDa/110kDa protein 1
2666904	1.30	SLC4A7	solute carrier family 4, sodium bicarbonate cotransporter, member 7
3856184	1.30	ZNF626	zinc finger protein 626
3687752	1.30	SEPT1	septin 1
3020804	1.30	NAA38	N(alpha)-acetyltransferase 38, NatC auxiliary subunit
2587790	1.30	GPR155	G protein-coupled receptor 155
3115504	1.30	MYC	v-myc myelocytomatosis viral oncogene homolog (avian)
2550959	1.30	PREPL	prolyl endopeptidase-like
3292448	1.30	HERC4	hect domain and RLD 4
2491745	1.30	GNLY	granulysin
3397589	1.30	ETS1	v-ets erythroblastosis virus E26 oncogene homolog 1 (avian)
3053229	1.30	ZNF680	zinc finger protein 680
2979056	1.30	NUP43	nucleoporin 43kDa
3167511	1.30	GALT	galactose-1-phosphate uridylyltransferase
3708462	1.30	ACAP1	ArfGAP with coiled-coil, ankyrin repeat and PH domains 1
2474651	1.30	ZNF512	zinc finger protein 512
3835467	1.30	ZNF234	zinc finger protein 234
3105777	1.30	WWP1	WW domain containing E3 ubiquitin protein ligase 1
2425447	1.29	DPH5	DPH5 homolog (S. cerevisiae)
2915828	1.29	NT5E	5'-nucleotidase, ecto (CD73)
3780271	1.29	C18orf1	chromosome 18 open reading frame 1
2849992	1.29	FAM134B	family with sequence similarity 134, member B
3124353	1.29	XKR6	XK, Kell blood group complex subunit-related family, member 6
2921456	1.29	KIAA1919	KIAA1919
3257031	1.29	STAMBPL1	STAM binding protein-like 1
2484552	1.29	AHSA2	AHA1, activator of heat shock 90kDa protein ATPase homolog 2 (yeast)
3494706	1.29	SLAIN1	SLAIN motif family, member 1
3031533	1.29	GIMAP4	GTPase, IMAP family member 4
3480013	1.29	MPHOSPH8	M-phase phosphoprotein 8

2809810	1.29	GZMA	granzyme A (granzyme 1, cytotoxic T-lymphocyte-associated serine esterase 3)
3280224	1.29	NSUN6	NOP2/Sun domain family, member 6
3894765	1.29	SIRPG	signal-regulatory protein gamma
2879927	1.29	LARS	leucyl-tRNA synthetase
3584728	1.29	SNRPN	small nuclear ribonucleoprotein polypeptide N
3498476	1.29	UBAC2	UBA domain containing 2
3399623	1.28	THYN1	thymocyte nuclear protein 1
2420958	1.28	ZNHIT6	zinc finger, HIT-type containing 6
2788926	1.28	NR3C2	nuclear receptor subfamily 3, group C, member 2
2785035	1.28	MFSD8	major facilitator superfamily domain containing 8
3829857	1.28	ZNF302	zinc finger protein 302
2607020	1.28	MTERFD2	MTERF domain containing 2
3403077	1.28	C12orf57	chromosome 12 open reading frame 57
3586834	1.28	FAN1	FANCD2/FANCI-associated nuclease 1
2519756	1.28	WDR75	WD repeat domain 75
3275922	1.28	PRKCQ	protein kinase C, theta
3124344	1.28	XKR6	XK, Kell blood group complex subunit-related family, member 6
2828135	1.28	LYRM7	Lyrm7 homolog (mouse)
3754677	1.28	SYNRG	synergins, gamma
2444790	1.28	MRPS14	mitochondrial ribosomal protein S14
3091403	1.28	EPHX2	epoxide hydrolase 2, cytoplasmic
2688717	1.28	BTLA	B and T lymphocyte associated
3389745	1.28	CWF19L2	CWF19-like 2, cell cycle control (S. pombe)
2978050	1.28	SHPRH	SNF2 histone linker PHD RING helicase
2344393	1.28	PRKACB	protein kinase, cAMP-dependent, catalytic, beta
3666282	1.28	ZFP90	zinc finger protein 90 homolog (mouse)
3452231	1.28	SLC38A1	solute carrier family 38, member 1
2562932	1.28	CD8A	CD8a molecule
2812273	1.28	PPWD1	peptidylprolyl isomerase domain and WD repeat containing 1
2867693	1.28	TTC37	tetratricopeptide repeat domain 37
2964350	1.28	MDN1	MDN1, midasin homolog (yeast)
3589410	1.28	C15orf54	chromosome 15 open reading frame 54
2916952	1.27	CASP8AP2	caspase 8 associated protein 2
2325410	1.27	NIPAL3	NIPA-like domain containing 3
2774565	1.27	CNOT6L	CCR4-NOT transcription complex, subunit 6-like
2924619	1.27	TRMT11	tRNA methyltransferase 11 homolog (S. cerevisiae)
2515707	1.27	PDK1	pyruvate dehydrogenase kinase, isozyme 1
2418000	1.27	ZRANB2	zinc finger, RAN-binding domain containing 2
2475710	1.27	LCLAT1	lysocardiolipin acyltransferase 1

2478748	1.27	EML4	echinoderm microtubule associated protein like 4
3633550	1.27	IMP3	IMP3, U3 small nucleolar ribonucleoprotein, homolog (yeast)
2821417	1.27	LNPEP	leucyl/cystinyl aminopeptidase
2592005	1.27	HIBCH	3-hydroxyisobutyryl-CoA hydrolase
2704894	1.27	PHC3	polyhomeotic homolog 3 (Drosophila)
2491935	1.27	PTCD3	Pentatricopeptide repeat domain 3
3413067	1.27	FAM113B	family with sequence similarity 113, member B
3731826	1.27	PRKCA	protein kinase C, alpha
3576812	1.27	TRIP11	thyroid hormone receptor interactor 11
3617830	1.27	ZNF770	zinc finger protein 770
2789266	1.27	LRBA	LPS-responsive vesicle trafficking, beach and anchor containing
3929821	1.27	CRYZL1	crystallin, zeta (quinone reductase)-like 1
3551566	1.27	EVL	Enah/Vasp-like
2859667	1.27	CENPK	centromere protein K
3831698	1.27	ZNF420	zinc finger protein 420
3444503	1.26	TAS2R31	taste receptor, type 2, member 31
3061046	1.26	KRIT1	KRIT1, ankyrin repeat containing
3718555	1.26	SLFN5	schlafen family member 5
2998333	1.26	C7orf36	chromosome 7 open reading frame 36
3243078	1.26	ZNF33A	zinc finger protein 33A
3068476	1.26	TMEM168	transmembrane protein 168
3376976	1.26	RASGRP2	RAS guanyl releasing protein 2 (calcium and DAG-regulated)
3351385	1.26	MLL	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila)
2638988	1.26	PARP15	poly (ADP-ribose) polymerase family, member 15
3755903	1.26	GSDMB	gasdermin B
3857171	1.26	ZNF675	zinc finger protein 675
3558359	1.26	GZMH	granzyme H (cathepsin G-like 2, protein h-CCPX)
3293840	1.26	SPOCK2	sparc/osteonectin, cwcv and kazal-like domains proteoglycan (testican) 2
3307939	1.26	ABLIM1	actin binding LIM protein 1
2993206	1.26	MPP6	membrane protein, palmitoylated 6 (MAGUK p55 subfamily member 6)
2440295	1.26	CD84	CD84 molecule
3441941	1.26	VAMP1	vesicle-associated membrane protein 1 (synaptobrevin 1)
3795866	1.26	ENOSF1	enolase superfamily member 1
3210179	1.26	C9orf95	chromosome 9 open reading frame 95
3181417	1.26	ANP32B	acidic (leucine-rich) nuclear phosphoprotein 32 family, member B

3828887	1.26	ZNF507	zinc finger protein 507
3849688	1.26	ZNF266	zinc finger protein 266
2329669	1.26	ZMYM1	zinc finger, MYM-type 1
3922602	1.26	UBASH3A	ubiquitin associated and SH3 domain containing A
3180717	1.26	C9orf102	chromosome 9 open reading frame 102
2550542	1.26	THADA	thyroid adenoma associated
2635263	1.26	DZIP3	DAZ interacting protein 3, zinc finger
2713837	1.26	ZNF718	zinc finger protein 718
2427688	1.26	LRIF1	ligand dependent nuclear receptor interacting factor 1
3403140	1.26	EMG1	EMG1 nucleolar protein homolog (S. cerevisiae)
3826504	1.25	ZNF431	zinc finger protein 431
3641871	1.25	LINS	lines homolog (Drosophila)
3732230	1.25	PITPNC1	phosphatidylinositol transfer protein, cytoplasmic 1
3011977	1.25	GTPBP10	GTP-binding protein 10 (putative)
2687739	1.25	CD47	CD47 molecule
2698844	1.25	ATR	ataxia telangiectasia and Rad3 related
2378662	1.25	TRAF5	TNF receptor-associated factor 5
3389529	1.25	KIAA1826	KIAA1826
3268669	1.25	BUB3	budding uninhibited by benzimidazoles 3 homolog (yeast)
3568310	1.25	ZBTB25	zinc finger and BTB domain containing 25
3645947	1.25	CLUAP1	clusterin associated protein 1
3828162	1.25	C19orf2	chromosome 19 open reading frame 2
2966253	1.25	PNISR	PNN-interacting serine/arginine-rich protein
3420854	1.25	DYRK2	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2
2462456	1.25	HEATR1	HEAT repeat containing 1
3766861	1.25	POLG2	polymerase (DNA directed), gamma 2, accessory subunit
2346738	1.25	RPAP2	RNA polymerase II associated protein 2
2910218	1.25	PAQR8	progesterone and adipoQ receptor family member VIII
3857105	1.25	ZNF91	zinc finger protein 91
2348896	1.25	CDC14A	CDC14 cell division cycle 14 homolog A (S. cerevisiae)
3831774	1.25	ZNF383	zinc finger protein 383
2488785	1.25	ALMS1	Alstrom syndrome 1
2592356	1.25	STAT4	signal transducer and activator of transcription 4
2865050	1.25	RPS23	ribosomal protein S23
3214668	1.25	IARS	isoleucyl-tRNA synthetase
3554851	1.25	CRIP1	cysteine-rich protein 1 (intestinal)
2443450	1.25	SELL	selectin L

3647827	1.25	ATF7IP2	activating transcription factor 7 interacting protein 2
2418451	1.25	CRYZ	crystallin, zeta (quinone reductase)
2645579	1.25	RASA2	RAS p21 protein activator 2
3869761	1.25	ZNF600	zinc finger protein 600
2659918	1.25	LRCH3	leucine-rich repeats and calponin homology (CH) domain containing 3
3404496	1.25	KLRF1	killer cell lectin-like receptor subfamily F, member 1
2508611	1.25	ARHGAP15	Rho GTPase activating protein 15
3861064	1.25	ZNF573	zinc finger protein 573
2728448	1.25	POLR2B	polymerase (RNA) II (DNA directed) polypeptide B, 140kDa
3766893	1.25	DDX5	DEAD (Asp-Glu-Ala-Asp) box polypeptide 5
2536757	1.25	ING5	inhibitor of growth family, member 5
2825629	1.25	TNFAIP8	tumor necrosis factor, alpha-induced protein 8
3758078	1.25	EZH1	enhancer of zeste homolog 1 (Drosophila)
2922840	1.25	KPNA5	karyopherin alpha 5 (importin alpha 6)
3966225	1.25	RABL2B	RAB, member of RAS oncogene family-like 2B
3519119	1.25	RBM26	RNA binding motif protein 26
2638728	1.25	SLC15A2	solute carrier family 15 (H ⁺ /peptide transporter), member 2
3013178	1.25	CASD1	CAS1 domain containing 1
2518272	1.25	ITGA4	integrin, alpha 4 (antigen CD49D, alpha 4 subunit of VLA-4 receptor)
2921402	1.24	SLC16A10	solute carrier family 16, member 10 (aromatic amino acid transporter)
2990342	1.24	TMEM106B	transmembrane protein 106B
3195344	1.24	MRPL41	mitochondrial ribosomal protein L41
2498977	1.24	GCC2	GRIP and coiled-coil domain containing 2
2521574	1.24	PLCL1	phospholipase C-like 1
3325263	1.24	DNAJC24	DnaJ (Hsp40) homolog, subfamily C, member 24
2523419	1.24	ALS2CR8	amyotrophic lateral sclerosis 2 (juvenile) chromosome region, candidate 8
2971564	1.24	C6orf204	chromosome 6 open reading frame 204
3920385	1.24	TTC3	tetratricopeptide repeat domain 3
3065480	1.24	NAPEPLD	N-acyl phosphatidylethanolamine phospholipase D
3403015	1.24	ENO2	enolase 2 (gamma, neuronal)
3400384	1.24	WNK1	WNK lysine deficient protein kinase 1
3332729	1.24	CD5	CD5 molecule
3094514	1.24	DDHD2	DDHD domain containing 2
3518977	1.24	RNF219	ring finger protein 219

2736259	1.24	SMARCAD1	SWI/SNF-related, matrix-associated actin-dependent regulator of chromatin, subfamily a, containing DEAD/H box 1
3200982	1.24	MLLT3	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 3
3332663	1.24	CD6	CD6 molecule
3047953	1.24	C7orf25	proteasome (prosome, macropain) subunit, alpha type, 2
3199790	1.24	PSIP1	PC4 and SFRS1 interacting protein 1
2980812	1.24	TFB1M	transcription factor B1, mitochondrial
2382781	1.24	SRP9	signal recognition particle 9kDa
3217807	1.24	TEX10	testis expressed 10
3764103	1.24	SRSF1	serine/arginine-rich splicing factor 1
2767378	1.24	ATP8A1	ATPase, aminophospholipid transporter (APLT), class I, type 8A, member 1
3326938	1.24	TRIM44	tripartite motif containing 44
2402111	1.24	C1orf63	chromosome 1 open reading frame 63
3264744	1.24	TCF7L2	transcription factor 7-like 2 (T-cell specific, HMG-box)
2705266	1.24	TNIK	TRAF2 and NCK interacting kinase
2914820	1.24	BCKDHB	branched chain keto acid dehydrogenase E1, beta polypeptide
3526831	1.24	RASA3	RAS p21 protein activator 3
3654956	1.24	LAT	linker for activation of T cells
3932148	1.24	BRWD1	bromodomain and WD repeat domain containing 1
2502424	1.24	INSIG2	insulin induced gene 2
3285552	1.24	ZNF248	zinc finger protein 248
2566645	1.24	MITD1	MIT, microtubule interacting and transport, domain containing 1
3494137	1.24	LMO7	LIM domain 7
3874438	1.24	CDC25B	cell division cycle 25 homolog B (S. pombe)
3709244	1.24	CHD3	chromodomain helicase DNA binding protein 3
2594569	1.24	ORC2	origin recognition complex, subunit 2
3721251	1.24	KRTAP9-3	keratin associated protein 9-3
3223738	1.24	TRAF1	TNF receptor-associated factor 1
2358700	1.24	GABPB2	GA binding protein transcription factor, beta subunit 2
2586227	1.24	FASTKD1	FAST kinase domains 1
3736087	1.24	TNRC6C	trinucleotide repeat containing 6C
3902743	1.24	C20orf112	chromosome 20 open reading frame 112
3027915	1.24	SSBP1	single-stranded DNA binding protein 1
2591942	1.24	ORMDL1	ORM1-like 1 (S. cerevisiae)
3142217	1.24	PAG1	phosphoprotein associated with glycosphingolipid microdomains 1

2768654	1.24	OCIAD2	OCIA domain containing 2
2419046	1.24	ZZZ3	zinc finger, ZZ-type containing 3
3096428	1.24	FNTA	farnesyltransferase, CAAX box, alpha
2580304	1.24	ORC4	origin recognition complex, subunit 4
2601648	1.24	DOCK10	dedicator of cytokinesis 10
2759303	1.23	MRFAP1L1	Morf4 family associated protein 1-like 1
3526378	1.23	PCID2	PCI domain containing 2
2744597	1.23	NAA15	N(alpha)-acetyltransferase 15, NatA auxiliary subunit
2427619	1.23	KCNA3	potassium voltage-gated channel, shaker-related subfamily, member 3
2968652	1.23	SESN1	sestrin 1
2387006	1.23	MTR	5-methyltetrahydrofolate-homocysteine methyltransferase
3059942	1.23	KIAA1324L	KIAA1324-like
3429669	1.23	CHST11	carbohydrate (chondroitin 4) sulfotransferase 11
2550790	1.23	LRPPRC	leucine-rich PPR-motif containing
3579114	1.23	BCL11B	B-cell CLL/lymphoma 11B (zinc finger protein)
2394784	1.23	NOL9	nucleolar protein 9
2916246	1.23	C6orf162	chromosome 6 open reading frame 162
3060917	1.23	MTERF	mitochondrial transcription termination factor
3366519	1.23	FANCF	Fanconi anemia, complementation group F
2591906	1.23	OSGEPL1	O-sialoglycoprotein endopeptidase-like 1
2414998	1.23	MYSM1	Myb-like, SWIRM and MPN domains 1
3175597	1.23	VPS13A	vacuolar protein sorting 13 homolog A (S. cerevisiae)
2601021	1.23	FARSB	phenylalanyl-tRNA synthetase, beta subunit
3869461	1.23	ZNF616	zinc finger protein 616
3744324	1.23	CTC1	CTS telomere maintenance complex component 1
3439305	1.23	ZNF84	zinc finger protein 84
3872398	1.23	ZNF671	zinc finger protein 671
3247712	1.23	CISD1	CDGSH iron sulfur domain 1
3638068	1.23	DET1	de-etiolated homolog 1 (Arabidopsis)
3645816	1.23	ZNF75A	zinc finger protein 75a
2495187	1.23	ZAP70	zeta-chain (TCR) associated protein kinase 70kDa
2461037	1.23	PCNXL2	pecanex-like 2 (Drosophila)
2636483	1.23	SIDT1	SID1 transmembrane family, member 1
3396179	1.23	C11orf61	chromosome 11 open reading frame 61
2999485	1.23	STK17A	serine/threonine kinase 17a
2928874	1.23	PEX3	peroxisomal biogenesis factor 3
3124333	1.23	XKR6	XK, Kell blood group complex subunit-related family, member 6

3144740	1.23	FAM92A1	family with sequence similarity 92, member A1
2766122	1.23	KLF3	Kruppel-like factor 3 (basic)
2666478	1.23	TOP2B	topoisomerase (DNA) II beta 180kDa
2891052	1.23	GNB2L1	guanine nucleotide binding protein (G protein), beta polypeptide 2-like 1
2893130	1.23	FARS2	phenylalanyl-tRNA synthetase 2, mitochondrial
3065963	1.23	ORC5	origin recognition complex, subunit 5
2816506	1.23	S100Z	S100 calcium binding protein Z
3239380	1.23	THNSL1	threonine synthase-like 1 (<i>S. cerevisiae</i>)
3534201	1.23	PRPF39	PRP39 pre-mRNA processing factor 39 homolog (<i>S. cerevisiae</i>)
3476012	1.23	MPHOSPH9	M-phase phosphoprotein 9
2585701	1.23	STK39	serine threonine kinase 39
3835418	1.23	ZNF224	zinc finger protein 224
3538893	1.23	PRKCH	protein kinase C, eta
2593464	1.23	ANKRD44	ankyrin repeat domain 44
2401347	1.23	TCEA3	transcription elongation factor A (SII), 3
2845274	1.23	CCDC127	coiled-coil domain containing 127
2528347	1.23	ANKZF1	ankyrin repeat and zinc finger domain containing 1
2963929	1.23	RNGTT	RNA guanylyltransferase and 5'-phosphatase
2927967	1.23	C6orf115	chromosome 6 open reading frame 115
2375795	1.23	LAX1	lymphocyte transmembrane adaptor 1
3537967	1.23	KIAA0586	KIAA0586
3187577	1.23	CNTRL	centriolin
2863049	1.22	POC5	POC5 centriolar protein homolog (<i>Chlamydomonas</i>)
3182019	1.22	STX17	syntaxin 17
2780734	1.22	TBCK	TBC1 domain containing kinase
2345929	1.22	LRRC8C	leucine rich repeat containing 8 family, member C
2493858	1.22	MAL	mal, T-cell differentiation protein
2695701	1.22	NPHP3	nephronophthisis 3 (adolescent)
2324743	1.22	ZBTB40	zinc finger and BTB domain containing 40
2520291	1.22	GLS	glutaminase
2589291	1.22	TTN	titin
3004628	1.22	ZNF107	zinc finger protein 107
3144760	1.22	RBM12B	RNA binding motif protein 12B
3764933	1.22	TUBD1	tubulin, delta 1
2976626	1.22	REPS1	RALBP1 associated Eps domain containing 1
2681753	1.22	FOXP1	forkhead box P1
2621583	1.22	ZNF589	zinc finger protein 589
3385042	1.22	SYTL2	synaptotagmin-like 2
2331213	1.22	MACF1	microtubule-actin crosslinking factor 1
3299255	1.22	ATAD1	ATPase family, AAA domain containing 1

3410384	1.22	C12orf35	chromosome 12 open reading frame 35
2748198	1.22	KIAA0922	KIAA0922
2480992	1.22	MSH2	mutS homolog 2, colon cancer, nonpolyposis type 1 (E. coli)
2518743	1.22	NUP35	nucleoporin 35kDa
3505319	1.22	SACS	spastic ataxia of Charlevoix-Saguenay (sacsin)
3514685	1.22	NCRNA00282	non-protein coding RNA 282
3843233	1.22	ZNF17	zinc finger protein 17
3126504	1.22	CSGALNACT1	chondroitin sulfate N-acetylglactosaminyltransferase 1
2648141	1.22	MBNL1	muscleblind-like (Drosophila)
2555277	1.22	USP34	ubiquitin specific peptidase 34
2732611	1.22	MRPL1	mitochondrial ribosomal protein L1
3755510	1.22	PLXDC1	plexin domain containing 1
2996321	1.22	BBS9	Bardet-Biedl syndrome 9
3835494	1.22	ZNF226	zinc finger protein 226
2656738	1.22	EIF4A2	eukaryotic translation initiation factor 4A2
3556418	1.22	METTL3	methyltransferase like 3
3385003	1.22	CREBZF	CREB/ATF bZIP transcription factor
3806689	1.22	HDHD2	haloacid dehalogenase-like hydrolase domain containing 2
3444436	1.22	TAS2R14	taste receptor, type 2, member 14
2660648	1.22	CRBN	cereblon
2422885	1.22	GLMN	glomulin, FKBP associated protein
2597867	1.22	IKZF2	IKAROS family zinc finger 2 (Helios)
2689516	1.22	ZBTB20	zinc finger and BTB domain containing 20
2724671	1.22	RHOH	ras homolog gene family, member H
3265133	1.22	NHLRC2	NHL repeat containing 2
2689042	1.22	WDR52	WD repeat domain 52
3283920	1.22	ARHGAP12	Rho GTPase activating protein 12
3542689	1.22	PCNX	pecanex homolog (Drosophila)
2899413	1.22	BTN3A3	butyrophilin, subfamily 3, member A3
2438125	1.22	CCT3	chaperonin containing TCP1, subunit 3 (gamma)
3190558	1.22	SPTAN1	spectrin, alpha, non-erythrocytic 1 (alpha-fodrin)
2458921	1.22	ITPKB	inositol 1,4,5-trisphosphate 3-kinase B
2735459	1.22	HERC3	hect domain and RLD 3
2585236	1.22	TTC21B	tetratricopeptide repeat domain 21B
2558483	1.22	C2orf42	chromosome 2 open reading frame 42
2362351	1.22	PYHIN1	pyrin and HIN domain family, member 1
4044637	1.21	SLC35E2B	solute carrier family 35, member E2B
3087813	1.21	PCM1	pericentriolar material 1
3627363	1.21	NARG2	NMDA receptor regulated 2
3151607	1.21	FBXO32	F-box protein 32

3255402	1.21	FAM190B	family with sequence similarity 190, member B
3624362	1.21	LEO1	Leo1, Paf1/RNA polymerase II complex component, homolog (<i>S. cerevisiae</i>)
3552729	1.21	PPP2R5C	protein phosphatase 2, regulatory subunit B', gamma
3421446	1.21	CPSF6	cleavage and polyadenylation specific factor 6, 68kDa
3478457	1.21	STX2	syntaxin 2
3929395	1.21	GCFC1	GC-rich sequence DNA-binding factor 1
3417371	1.21	ESYT1	extended synaptotagmin-like protein 1
2898452	1.21	MRS2	MRS2 magnesium homeostasis factor homolog (<i>S. cerevisiae</i>)
2990043	1.21	PHF14	PHD finger protein 14
2781693	1.21	CASP6	caspase 6, apoptosis-related cysteine peptidase
3503224	1.21	UPF3A	UPF3 regulator of nonsense transcripts homolog A (yeast)
2331602	1.21	PPIE	peptidylprolyl isomerase E (cyclophilin E)
3710277	1.21	C17orf48	chromosome 17 open reading frame 48
3421177	1.21	NUP107	nucleoporin 107kDa
2742134	1.21	SPATA5	spermatogenesis associated 5
2842101	1.21	SFXN1	sideroflexin 1
2746024	1.21	ABCE1	ATP-binding cassette, sub-family E (OABP), member 1
2913594	1.21	MTO1	mitochondrial translation optimization 1 homolog (<i>S. cerevisiae</i>)
3511189	1.21	MTRF1	mitochondrial translational release factor 1
2739160	1.21	CCDC109B	coiled-coil domain containing 109B
2478928	1.21	MTA3	metastasis associated 1 family, member 3
2726828	1.21	DCUN1D4	DCN1, defective in cullin neddylation 1, domain containing 4 (<i>S. cerevisiae</i>)
2796790	1.21	KIAA1430	KIAA1430
2476411	1.21	TTC27	tetratricopeptide repeat domain 27
3692928	1.21	BBS2	Bardet-Biedl syndrome 2
2645387	1.21	ACPL2	acid phosphatase-like 2
3065601	1.21	DPY19L2P2	dpy-19-like 2 pseudogene 2 (<i>C. elegans</i>)
2574884	1.21	IWS1	IWS1 homolog (<i>S. cerevisiae</i>)
2934801	1.21	MAP3K4	mitogen-activated protein kinase kinase kinase 4
3227574	1.21	FAM78A	family with sequence similarity 78, member A
3842675	1.21	ZNF542	zinc finger protein 542
2824483	1.21	YTHDC2	YTH domain containing 2
2677723	1.21	ARHGEF3	Rho guanine nucleotide exchange factor (GEF) 3
2974188	1.21	MED23	mediator complex subunit 23
2689112	1.21	SPICE1	spindle and centriole associated protein 1

2915268	1.21	DOPEY1	dopey family member 1
2743029	1.21	C4orf29	chromosome 4 open reading frame 29
2829488	1.21	DDX46	DEAD (Asp-Glu-Ala-Asp) box polypeptide 46
3268588	1.21	ACADSB	acyl-CoA dehydrogenase, short/branched chain
2456746	1.21	EPRS	glutamyl-prolyl-tRNA synthetase
3679503	1.21	TMEM186	transmembrane protein 186
2348634	1.21	AGL	amylo-alpha-1, 6-glucosidase, 4-alpha-glucanotransferase
3538470	1.21	C14orf135	chromosome 14 open reading frame 135
3485863	1.21	EXOSC8	exosome component 8
3901191	1.21	NAPB	N-ethylmaleimide-sensitive factor attachment protein, beta
3510925	1.21	MRPS31	mitochondrial ribosomal protein S31
2476219	1.21	BIRC6	baculoviral IAP repeat-containing 6
3263555	1.21	ADD3	adducin 3 (gamma)
2811656	1.21	KIF2A	kinesin heavy chain member 2A
3765642	1.21	INTS2	integrator complex subunit 2
2589868	1.21	CCDC141	coiled-coil domain containing 141
2737069	1.21	METAP1	methionyl aminopeptidase 1
2965739	1.21	MMS22L	MMS22-like, DNA repair protein
2343025	1.21	AK5	adenylate kinase 5
3831475	1.21	ZNF382	zinc finger protein 382
2855434	1.21	C5orf39	chromosome 5 open reading frame 39
3837464	1.21	GLTSCR2	glioma tumor suppressor candidate region gene 2
2969201	1.21	AKD1	adenylate kinase domain containing 1
2639309	1.21	SEC22A	SEC22 vesicle trafficking protein homolog A (S. cerevisiae)
2695648	1.21	ACAD11	acyl-CoA dehydrogenase family, member 11
3091628	1.21	ELP3	elongation protein 3 homolog (S. cerevisiae)
3249788	1.21	CCAR1	cell division cycle and apoptosis regulator 1
3322251	1.21	NUCB2	nucleobindin 2
2400322	1.21	HP1BP3	heterochromatin protein 1, binding protein 3
2517549	1.21	RBM45	RNA binding motif protein 45
3401704	1.21	CCND2	cyclin D2
2458017	1.21	NVL	nuclear VCP-like
3539724	1.21	SYNE2	spectrin repeat containing, nuclear envelope 2
2354082	1.21	WDR3	WD repeat domain 3
3051395	1.21	SEC61G	Sec61 gamma subunit
2413153	1.21	C1orf123	chromosome 1 open reading frame 123
3945056	1.21	EIF3L	eukaryotic translation initiation factor 3, subunit L
3243708	1.21	BMS1	BMS1 homolog, ribosome assembly protein (yeast)

3960629	1.21	DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17
2443537	1.20	SCYL3	SCY1-like 3 (<i>S. cerevisiae</i>)
2437645	1.20	GON4L	gon-4-like (<i>C. elegans</i>)
3456630	1.20	CBX5	chromobox homolog 5
2875419	1.20	KIF3A	kinesin family member 3A
3260423	1.20	CUTC	cutC copper transporter homolog (<i>E. coli</i>)
2895159	1.20	HIVP1	human immunodeficiency virus type I enhancer binding protein 1
3683050	1.20	SMG1	SMG1 homolog, phosphatidylinositol 3-kinase-related kinase (<i>C. elegans</i>)
2682568	1.20	SHQ1	SHQ1 homolog (<i>S. cerevisiae</i>)
2695200	1.20	PIK3R4	phosphoinositide-3-kinase, regulatory subunit 4
3368520	1.20	CSTF3	cleavage stimulation factor, 3' pre-RNA, subunit 3, 77kDa
2439001	1.20	FCRL3	Fc receptor-like 3
3888133	1.20	CSE1L	CSE1 chromosome segregation 1-like (yeast)
2911944	1.20	PHF3	PHD finger protein 3
3864921	1.20	ZNF180	zinc finger protein 180
3855985	1.20	ZNF14	zinc finger protein 14
2343170	1.20	FAM73A	family with sequence similarity 73, member A
3163136	1.20	SNAPC3	small nuclear RNA activating complex, polypeptide 3, 50kDa
2375706	1.20	ATP2B4	ATPase, Ca ⁺⁺ transporting, plasma membrane 4
3082248	1.20	ESYT2	extended synaptotagmin-like protein 2
2341565	1.20	SRSF11	serine/arginine-rich splicing factor 11
3853453	1.20	RASAL3	RAS protein activator like 3
2349086	1.20	DPH5	DPH5 homolog (<i>S. cerevisiae</i>)
2779486	1.20	H2AFZ	H2A histone family, member Z
3918953	1.20	FLJ46020	FLJ46020 protein
2461473	1.20	TARBP1	TAR (HIV-1) RNA binding protein 1
3290875	1.20	ANK3	ankyrin 3, node of Ranvier (ankyrin G)
3562003	1.20	TRAPPC6B	trafficking protein particle complex 6B
2617041	1.20	GOLGA4	golgin A4
2510485	1.20	RIF1	RAP1 interacting factor homolog (yeast)
2814527	1.20	BDP1	B double prime 1, subunit of RNA polymerase III transcription initiation factor IIIB
3509910	1.20	FAM48A	family with sequence similarity 48, member A
2339682	1.20	ALG6	asparagine-linked glycosylation 6, alpha-1,3-glucosyltransferase homolog (<i>S. cerevisiae</i>)
3711262	1.20	HS3ST3B1	heparan sulfate (glucosamine) 3-O-sulfotransferase 3B1
2418929	1.20	PIGK	phosphatidylinositol glycan anchor biosynthesis, class K
2845078	1.20	TRIM52	tripartite motif-containing 52

3134034	1.20	PRKDC	protein kinase, DNA-activated, catalytic polypeptide
2889698	1.20	CLK4	CDC-like kinase 4
3602873	1.20	HMG20A	high-mobility group 20A
2437417	1.20	ASH1L	ash1 (absent, small, or homeotic)-like (Drosophila)
3480129	1.20	ZMYM2	zinc finger, MYM-type 2
2963707	1.20	RARS2	arginyl-tRNA synthetase 2, mitochondrial
2584018	1.20	DPP4	dipeptidyl-peptidase 4
2488732	1.20	CCT7	chaperonin containing TCP1, subunit 7 (eta)
2855058	1.20	OXCT1	3-oxoacid CoA transferase 1
3216476	1.20	ZNF510	zinc finger protein 510
3444406	1.20	TAS2R13	taste receptor, type 2, member 13
3930781	1.20	SETD4	SET domain containing 4
2426791	1.20	CLCC1	chloride channel CLIC-like 1
2460368	1.20	TTC13	tetratricopeptide repeat domain 13
2916390	1.20	ORC3	origin recognition complex, subunit 3
2351632	1.20	CEPT1	choline/ethanolamine phosphotransferase 1
2519981	1.20	PMS1	PMS1 postmeiotic segregation increased 1 (S. cerevisiae)
2320762	1.20	VPS13D	vacuolar protein sorting 13 homolog D (S. cerevisiae)
3203162	1.20	NDUFB6	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 6, 17kDa
3353417	1.20	CRTAM	cytotoxic and regulatory T cell molecule
3420497	1.20	HELB	helicase (DNA) B
2678714	1.20	FHIT	fragile histidine triad gene
3148582	1.20	EIF3E	eukaryotic translation initiation factor 3, subunit E
3119735	1.20	ZNF623	zinc finger protein 623
2897635	1.20	CDKAL1	CDK5 regulatory subunit associated protein 1-like 1
3023803	1.20	KLHDC10	kelch domain containing 10
2828564	1.20	RAD50	RAD50 homolog (S. cerevisiae)
2969886	1.20	FYN	FYN oncogene related to SRC, FGR, YES
2384956	1.20	COG2	component of oligomeric golgi complex 2
3326252	1.20	NAT10	N-acetyltransferase 10 (GCN5-related)
2620685	1.20	SACM1L	SAC1 suppressor of actin mutations 1-like (yeast)
3096092	1.20	IKBKB	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta
2448232	1.20	TPR	translocated promoter region (to activated MET oncogene)
2769512	1.20	RPL21P44	ribosomal protein L21 pseudogene 44
2495555	1.20	UNC50	unc-50 homolog (C. elegans)
2439944	1.20	PIGM	phosphatidylinositol glycan anchor biosynthesis, class M

2687255	1.20	CBLB	Cas-Br-M (murine) ecotropic retroviral transforming sequence b
3364095	1.20	CYP2R1	cytochrome P450, family 2, subfamily R, polypeptide 1
3448428	1.20	C12orf11	chromosome 12 open reading frame 11
2347502	1.20	ABCD3	ATP-binding cassette, sub-family D (ALD), member 3
3918447	1.20	IFNAR2	interferon (alpha, beta and omega) receptor 2
3860491	1.20	ZNF790	zinc finger protein 790
2697490	1.20	CEP70	centrosomal protein 70kDa
2600689	1.20	EPHA4	EPH receptor A4
2686371	1.20	TOMM70A	translocase of outer mitochondrial membrane 70 homolog A (<i>S. cerevisiae</i>)
2486927	1.20	ARHGAP25	Rho GTPase activating protein 25
3378818	1.20	PTPRCAP	protein tyrosine phosphatase, receptor type, C-associated protein
3225292	1.20	SCAI	suppressor of cancer cell invasion
2949118	1.20	LTB	lymphotoxin beta (TNF superfamily, member 3)
3825911	1.20	ZNF101	zinc finger protein 101
2813524	1.20	RAD17	RAD17 homolog (<i>S. pombe</i>)
3333603	1.19	TTC9C	tetratricopeptide repeat domain 9C
2404377	1.19	SNRNP40	small nuclear ribonucleoprotein 40kDa (U5)
2609608	1.19	SETD5	SET domain containing 5
3666033	1.19	NFATC3	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 3
2730531	1.19	UTP3	UTP3, small subunit (SSU) processome component, homolog (<i>S. cerevisiae</i>)
3779817	1.19	CEP192	centrosomal protein 192kDa
3214749	1.19	NOL8	nucleolar protein 8
2722291	1.19	TBC1D19	TBC1 domain family, member 19
2793054	1.19	CBR4	carbonyl reductase 4
2900299	1.19	ZNF192	zinc finger protein 192
3471769	1.19	TMEM116	transmembrane protein 116
3304215	1.19	LDB1	LIM domain binding 1
2500838	1.19	POLR1B	polymerase (RNA) I polypeptide B, 128kDa
2837810	1.19	UBLCP1	ubiquitin-like domain containing CTD phosphatase 1
2675628	1.19	VPRBP	Vpr (HIV-1) binding protein
2806517	1.19	SKP2	S-phase kinase-associated protein 2 (p45)
3415812	1.19	ZNF740	zinc finger protein 740
2977471	1.19	ADAT2	adenosine deaminase, tRNA-specific 2, TAD2 homolog (<i>S. cerevisiae</i>)
2877171	1.19	FAM13B	family with sequence similarity 13, member B
3946095	1.19	GRAP2	GRB2-related adaptor protein 2
3305017	1.19	OBFC1	oligonucleotide/oligosaccharide-binding fold containing 1

3159946	1.19	SMARCA2	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily a, member 2
2883380	1.19	MED7	mediator complex subunit 7
3025678	1.19	AGBL3	ATP/GTP binding protein-like 3
3634588	1.19	WDR61	WD repeat domain 61
2843804	1.19	ZNF354B	zinc finger protein 354B
2851965	1.19	DROSHA	drosha, ribonuclease type III
2373842	1.19	PTPRC	protein tyrosine phosphatase, receptor type, C
2964553	1.19	BACH2	BTB and CNC homology 1, basic leucine zipper transcription factor 2
2967989	1.19	SCML4	sex comb on midleg-like 4 (Drosophila)
2404819	1.19	PTP4A2	protein tyrosine phosphatase type IVA, member 2
3301609	1.19	ENTPD1	ectonucleoside triphosphate diphosphohydrolase 1
3782069	1.19	TTC39C	tetratricopeptide repeat domain 39C
3142519	1.19	ZFAND1	zinc finger, AN1-type domain 1
3719474	1.19	TADA2A	transcriptional adaptor 2A
2854327	1.19	FYB	FYN binding protein
3107661	1.19	INTS8	integrator complex subunit 8
3383046	1.19	RSF1	remodeling and spacing factor 1
2408111	1.19	TRIT1	tRNA isopentenyltransferase 1
3444147	1.19	KLRC1	killer cell lectin-like receptor subfamily C, member 1
2524743	1.19	FASTKD2	FAST kinase domains 2
3839818	1.19	ZNF175	zinc finger protein 175
2593352	1.19	GTF3C3	general transcription factor IIIC, polypeptide 3, 102kDa
3037142	1.19	PMS2	PMS2 postmeiotic segregation increased 2 (S. cerevisiae)
3860450	1.19	ZNF566	zinc finger protein 566
3605780	1.19	SCAND2	SCAN domain containing 2 pseudogene
3784468	1.19	ZNF397	zinc finger protein 397
3727510	1.19	STXBP4	syntaxin binding protein 4
2881747	1.19	ANXA6	annexin A6
2575054	1.19	WDR33	WD repeat domain 33
3717452	1.19	LRRC37B	leucine rich repeat containing 37B
2566764	1.19	REV1	REV1 homolog (S. cerevisiae)
2677653	1.19	C3orf63	chromosome 3 open reading frame 63
2559649	1.19	DUSP11	dual specificity phosphatase 11 (RNA/RNP complex 1-interacting)
3199662	1.19	TTC39B	tetratricopeptide repeat domain 39B
2913983	1.19	SENP6	SUMO1/sentrin specific peptidase 6
3199431	1.19	ZDHHC21	zinc finger, DHHC-type containing 21
2868131	1.19	ERAP1	endoplasmic reticulum aminopeptidase 1
3652271	1.19	C16orf52	chromosome 16 open reading frame 52

2356115	1.19	TXNIP	thioredoxin interacting protein
3490741	1.19	SUGT1	SGT1, suppressor of G2 allele of SKP1 (S. cerevisiae)
3450775	1.19	KIF21A	kinesin family member 21A
2481308	1.19	KLRAQ1	KLRAQ motif containing 1
2547454	1.19	NLRC4	NLR family, CARD domain containing 4
2405364	1.19	AK2	adenylate kinase 2
3572263	1.19	ACYP1	acylphosphatase 1, erythrocyte (common) type
2593670	1.19	SF3B1	splicing factor 3b, subunit 1, 155kDa
3359751	1.19	ZNF195	zinc finger protein 195
2951567	1.19	FKBP5	FK506 binding protein 5
2622469	1.19	RBM5	RNA binding motif protein 5
2522509	1.19	NIF3L1	NIF3 NGG1 interacting factor 3-like 1 (S. pombe)
3693673	1.19	CNOT1	CCR4-NOT transcription complex, subunit 1
3626704	1.19	SLTM	SAFB-like, transcription modulator
3832616	1.19	EIF3K	eukaryotic translation initiation factor 3, subunit K
3027961	1.19	TAS2R5	taste receptor, type 2, member 5
3493448	1.19	PIBF1	progesterone immunomodulatory binding factor 1
3909354	1.19	ADNP	activity-dependent neuroprotector homeobox
3439603	1.19	KDM5A	lysine (K)-specific demethylase 5A
3318731	1.19	DNHD1	dynein heavy chain domain 1
3735938	1.19	SEPT9	septin 9
3161566	1.19	KDM4C	lysine (K)-specific demethylase 4C
2823820	1.19	WDR36	WD repeat domain 36
3487220	1.19	AKAP11	A kinase (PRKA) anchor protein 11
2469910	1.19	LPIN1	lipin 1
2375810	1.19	ZC3H11A	zinc finger CCCH-type containing 11A
2950515	1.19	VPS52	vacuolar protein sorting 52 homolog (S. cerevisiae)
3826656	1.19	ZNF429	zinc finger protein 429
2779434	1.19	DNAJB14	DnaJ (Hsp40) homolog, subfamily B, member 14
3349453	1.19	TTC12	tetratricopeptide repeat domain 12
3653398	1.19	TNRC6A	trinucleotide repeat containing 6A
2378180	1.19	DIEXF	digestive organ expansion factor homolog (zebrafish)
2320048	1.19	TARDBP	TAR DNA binding protein
3727962	1.19	DGKE	diacylglycerol kinase, epsilon 64kDa
3301011	1.19	NOC3L	nucleolar complex associated 3 homolog (S. cerevisiae)
2839671	1.19	RARS	arginyl-tRNA synthetase
2425212	1.19	DBT	dihydrolipoamide branched chain transacylase E2

3151970	1.19	MTSS1	metastasis suppressor 1
3929664	1.19	TMEM50B	transmembrane protein 50B
2796875	1.19	UFSP2	UFM1-specific peptidase 2
3379390	1.19	SUV420H1	suppressor of variegation 4-20 homolog 1 (Drosophila)
2329077	1.19	S100PBP	S100P binding protein
2724585	1.18	N4BP2	NEDD4 binding protein 2
3720695	1.18	THRA	thyroid hormone receptor, alpha (erythroblastic leukemia viral (v-erb-a) oncogene homolog, avian)
3860793	1.18	ZNF585B	zinc finger protein 585A
3831588	1.18	ZNF345	zinc finger protein 345
3063536	1.18	TRIM4	tripartite motif-containing 4
2326049	1.18	MAN1C1	mannosidase, alpha, class 1C, member 1
2361036	1.18	DAP3	death associated protein 3
2434776	1.18	CDC42SE1	CDC42 small effector 1
2725779	1.18	GUF1	GUF1 GTPase homolog (S. cerevisiae)
2436228	1.18	GATAD2B	GATA zinc finger domain containing 2B
2350287	1.18	PRPF38B	PRP38 pre-mRNA processing factor 38 (yeast) domain containing B
3415915	1.18	PFDN5	prefoldin subunit 5
2391532	1.18	CCNL2	cyclin L2
2374872	1.18	IPO9	importin 9
2618640	1.18	RPL14	ribosomal protein L14
2369843	1.18	CEP350	centrosomal protein 350kDa
3859622	1.18	ZNF792	zinc finger protein 792
3011250	1.18	DMTF1	cyclin D binding myb-like transcription factor 1
2597409	1.18	LANCL1	LanC lantibiotic synthetase component C-like 1 (bacterial)
3503119	1.18	ZNF828	zinc finger protein 828
3784727	1.18	ELP2	elongation protein 2 homolog (S. cerevisiae)
3435490	1.18	DENR	density-regulated protein
2670481	1.18	ULK4	unc-51-like kinase 4 (C. elegans)
3300793	1.18	FRA10AC1	fragile site, folic acid type, rare, fra(10)(q23.3) or fra(10)(q24.2) candidate 1
2541230	1.18	NBAS	neuroblastoma amplified sequence
3150289	1.18	SAMD12	sterile alpha motif domain containing 12
2924898	1.18	RNF146	ring finger protein 146
2766588	1.18	PDS5A	PDS5, regulator of cohesion maintenance, homolog A (S. cerevisiae)
3535922	1.18	STYX	serine/threonine/tyrosine interacting protein
2783473	1.18	C4orf3	chromosome 4 open reading frame 3
2866543	1.18	CETN3	centrin, EF-hand protein, 3
3252382	1.18	KAT6B	K(lysine) acetyltransferase 6B
2954005	1.18	MRPS10	mitochondrial ribosomal protein S10

3014411	1.18	TRRAP	transformation/transcription domain-associated protein
3250093	1.18	KIAA1279	KIAA1279
2610417	1.18	C3orf42	chromosome 3 open reading frame 42
2638467	1.18	GTF2E1	general transcription factor IIE, polypeptide 1, alpha 56kDa
3795045	1.18	ATP9B	ATPase, class II, type 9B
2686646	1.18	SEN7	SUMO1/sentrin specific peptidase 7
3765299	1.18	APPBP2	amyloid beta precursor protein (cytoplasmic tail) binding protein 2
2440354	1.18	CD48	CD48 molecule
2979871	1.18	SYNE1	spectrin repeat containing, nuclear envelope 1
3089401	1.18	PPP3CC	protein phosphatase 3, catalytic subunit, gamma isozyme
3387033	1.18	MRE11A	MRE11 meiotic recombination 11 homolog A (S. cerevisiae)
3458133	1.18	PRIM1	primase, DNA, polypeptide 1 (49kDa)
3662201	1.18	MT1F	metallothionein 1F
3180957	1.18	HABP4	hyaluronan binding protein 4
2412834	1.18	ZCCHC11	zinc finger, CCHC domain containing 11
3712363	1.18	MPRIIP	myosin phosphatase Rho interacting protein
2388525	1.18	SDCCAG8	serologically defined colon cancer antigen 8
2712858	1.18	UBXN7	UBX domain protein 7
2334459	1.18	TMEM69	transmembrane protein 69
3146433	1.18	COX6C	cytochrome c oxidase subunit VIc
2352501	1.18	LRIG2	leucine-rich repeats and immunoglobulin-like domains 2
3395416	1.18	HSPA8	heat shock 70kDa protein 8
3578278	1.18	ATG2B	ATG2 autophagy related 2 homolog B (S. cerevisiae)
2495446	1.18	INPP4A	inositol polyphosphate-4-phosphatase, type I, 107kDa
2769182	1.18	SCFD2	sec1 family domain containing 2
2649640	1.18	GFM1	G elongation factor, mitochondrial 1
3623771	1.18	TRPM7	transient receptor potential cation channel, subfamily M, member 7
2368198	1.18	CACYBP	calcyclin binding protein
3135567	1.18	LYPLA1	lysophospholipase I
2612278	1.18	CAPN7	calpain 7
2563481	1.18	KRCC1	lysine-rich coiled-coil 1
3898224	1.18	ESF1	ESF1, nucleolar pre-rRNA processing protein, homolog (S. cerevisiae)
3153400	1.18	FAM49B	family with sequence similarity 49, member B
2461999	1.18	LYST	lysosomal trafficking regulator
2523144	1.18	NOP58	NOP58 ribonucleoprotein homolog (yeast)
3927903	1.18	N6AMT1	N-6 adenine-specific DNA methyltransferase 1 (putative)

3906160	1.18	CHD6	chromodomain helicase DNA binding protein 6
3107606	1.18	DPY19L4	dpy-19-like 4 (C. elegans)
2867145	1.18	FAM172A	family with sequence similarity 172, member A
3707481	1.18	ZFP3	zinc finger protein 3 homolog (mouse)
3598613	1.18	DIS3L	DIS3 mitotic control homolog (S. cerevisiae)-like
3534886	1.18	KLHDC1	kelch domain containing 1
3591400	1.18	TUBGCP4	tubulin, gamma complex associated protein 4
2594535	1.18	PPIL3	peptidylprolyl isomerase (cyclophilin)-like 3
3177563	1.18	NAA35	N(alpha)-acetyltransferase 35, NatC auxiliary subunit
2421782	1.18	CCBL2	cysteine conjugate-beta lyase 2
2753994	1.18	C4orf41	chromosome 4 open reading frame 41
2495881	1.18	EIF5B	eukaryotic translation initiation factor 5B
2588066	1.18	ATF2	activating transcription factor 2
2484305	1.18	PAPOLG	poly(A) polymerase gamma
3004665	1.18	ZNF138	zinc finger protein 138
3739679	1.18	VPS53	vacuolar protein sorting 53 homolog (S. cerevisiae)
2812435	1.18	ERBB2IP	erbb2 interacting protein
2741083	1.18	METTL14	methyltransferase like 14
2694123	1.18	RUVBL1	RuvB-like 1 (E. coli)
2558976	1.18	MCEE	methylmalonyl CoA epimerase
3320604	1.18	USP47	ubiquitin specific peptidase 47
2663038	1.18	C3orf31	chromosome 3 open reading frame 31
2422517	1.18	ZNF644	zinc finger protein 644
2553192	1.18	ASB3	ankyrin repeat and SOCS box-containing 3
3724591	1.18	C17orf57	chromosome 17 open reading frame 57
3527745	1.18	METTL17	methyltransferase 11 domain containing 1
2499158	1.18	RANBP2	RAN binding protein 2
2673873	1.18	IMPDH2	IMP (inosine 5'-monophosphate) dehydrogenase 2
2939593	1.18	ECI2	enoyl-CoA delta isomerase 2
3282117	1.18	ANKRD26	ankyrin repeat domain 26
2353881	1.18	MAN1A2	mannosidase, alpha, class 1A, member 2
3333622	1.18	POLR2G	polymerase (RNA) II (DNA directed) polypeptide G
2413519	1.18	HSPB11	heat shock protein family B (small), member 11
3024275	1.18	MKLN1	muskelin 1, intracellular mediator containing kelch motifs
2416522	1.18	JAK1	Janus kinase 1
3473331	1.18	C12orf49	chromosome 12 open reading frame 49
3114064	1.18	WDR67	WD repeat domain 67
2635983	1.18	ABHD10	abhydrolase domain containing 10

3425134	1.18	TMTC3	transmembrane and tetratricopeptide repeat containing 3
2544925	1.18	ASXL2	additional sex combs like 2 (Drosophila)
3904747	1.18	RBL1	retinoblastoma-like 1 (p107)
2731757	1.18	THAP6	THAP domain containing 6
3572235	1.18	MLH3	mutL homolog 3 (E. coli)
3609138	1.18	CHD2	chromodomain helicase DNA binding protein 2
2413032	1.18	ECHDC2	enoyl CoA hydratase domain containing 2
3279698	1.18	CUBN	cubilin (intrinsic factor-cobalamin receptor)
2443518	1.18	METTL18	methyltransferase like 18
2671422	1.18	ZNF445	zinc finger protein 445
2531310	1.18	SP140L	SP140 nuclear body protein-like
3351931	1.18	HINFP	histone H4 transcription factor
3751830	1.17	BLMH	bleomycin hydrolase
3254521	1.17	TSPAN14	tetraspanin 14
2338625	1.17	HOOK1	hook homolog 1 (Drosophila)
3145020	1.17	KIAA1429	KIAA1429
2868283	1.17	RIOK2	RIO kinase 2 (yeast)
2892738	1.17	PRPF4B	PRP4 pre-mRNA processing factor 4 homolog B (yeast)
2878474	1.17	HARS	histidyl-tRNA synthetase
3244539	1.17	ZNF22	zinc finger protein 22 (KOX 15)
2695393	1.17	MRPL3	mitochondrial ribosomal protein L3
2696252	1.17	RYK	RYK receptor-like tyrosine kinase
3499453	1.17	TPP2	tripeptidyl peptidase II
3430331	1.17	RIC8B	resistance to inhibitors of cholinesterase 8 homolog B (C. elegans)
3638048	1.17	MRPL46	mitochondrial ribosomal protein L46
3602526	1.17	FBXO22	F-box protein 22
2458773	1.17	PARP1	poly (ADP-ribose) polymerase 1
3537264	1.17	C14orf101	chromosome 14 open reading frame 101
3448975	1.17	ERGIC2	ERGIC and golgi 2
3414776	1.17	LETMD1	LETM1 domain containing 1
2492064	1.17	KDM3A	lysine (K)-specific demethylase 3A
3015442	1.17	PILRB	paired immunoglobulin-like type 2 receptor beta
2435195	1.17	MRPL9	mitochondrial ribosomal protein L9
3748659	1.17	GRAP	GRB2-related adaptor protein
2407439	1.17	SF3A3	splicing factor 3a, subunit 3, 60kDa
3294499	1.17	PPP3CB	protein phosphatase 3, catalytic subunit, beta isozyme
3781980	1.17	TTC39C	tetratricopeptide repeat domain 39C
2937856	1.17	FAM120B	family with sequence similarity 120B
2348702	1.17	SLC35A3	solute carrier family 35 (UDP-N-acetylglucosamine (UDP-GlcNAc) transporter), member A3

3931112	1.17	HLCS	holocarboxylase synthetase (biotin-(propionyl-CoA-carboxylase (ATP-hydrolysing)) ligase)
2468376	1.17	RNF144A	ring finger protein 144A
3531479	1.17	ARHGAP5	Rho GTPase activating protein 5
2586845	1.17	SLC25A12	solute carrier family 25 (mitochondrial carrier, Aralar), member 12
3949097	1.17	TRMU	tRNA 5-methylaminomethyl-2-thiouridylate methyltransferase
3387537	1.17	MAML2	mastermind-like 2 (Drosophila)
2488078	1.17	MPHOSPH10	M-phase phosphoprotein 10 (U3 small nucleolar ribonucleoprotein)
3508696	1.17	N4BP2L2	NEDD4 binding protein 2-like 2
2409904	1.17	EIF2B3	eukaryotic translation initiation factor 2B, subunit 3 gamma, 58kDa
3183305	1.17	FKTN	fukutin
3414440	1.17	C12orf62	chromosome 12 open reading frame 62
3960110	1.17	MFNG	MFNG O-fucosylpeptide 3-beta-N-acetylglucosaminyltransferase
2470165	1.17	TRIB2	tribbles homolog 2 (Drosophila)
3428088	1.17	ACTR6	ARP6 actin-related protein 6 homolog (yeast)
2857488	1.17	ANKRD55	ankyrin repeat domain 55
2717101	1.17	KIAA0232	KIAA0232
2814855	1.17	PTCD2	pentatricopeptide repeat domain 2
2347788	1.17	RWDD3	RWD domain containing 3
3347831	1.17	DDX10	DEAD (Asp-Glu-Ala-Asp) box polypeptide 10
2336302	1.17	ZFYVE9	zinc finger, FYVE domain containing 9
3410445	1.17	BICD1	bicaudal D homolog 1 (Drosophila)
3486383	1.17	COG6	component of oligomeric golgi complex 6
3419239	1.17	MON2	MON2 homolog (S. cerevisiae)
3420713	1.17	CAND1	cullin-associated and neddylation-dissociated 1
3695268	1.17	NAE1	NEDD8 activating enzyme E1 subunit 1
3471819	1.17	NAA25	N(alpha)-acetyltransferase 25, NatB auxiliary subunit
3076076	1.17	SLC37A3	solute carrier family 37 (glycerol-3-phosphate transporter), member 3
3732448	1.17	BPTF	bromodomain PHD finger transcription factor
2566383	1.17	COA5	cytochrome C oxidase assembly factor 5
3942954	1.17	DRG1	developmentally regulated GTP binding protein 1
2526980	1.17	XRCC5	X-ray repair complementing defective repair in Chinese hamster cells 5 (double-strand-break rejoining)
3504434	1.17	XPO4	exportin 4
2688882	1.17	C3orf17	chromosome 3 open reading frame 17
2537109	1.17	SH3YL1	SH3 domain containing, Ysc84-like 1 (S. cerevisiae)

2955282	1.17	SUPT3H	suppressor of Ty 3 homolog (<i>S. cerevisiae</i>)
3035990	1.17	CARD11	caspase recruitment domain family, member 11
2713192	1.17	DLG1	discs, large homolog 1 (<i>Drosophila</i>)
3181302	1.17	NCBP1	nuclear cap binding protein subunit 1, 80kDa
3681377	1.17	PARN	poly(A)-specific ribonuclease (deadenylation nuclease)
3872310	1.17	ZNF550	zinc finger protein 550
2901660	1.17	PRR3	proline rich 3
3444195	1.17	MAGOHB	mago-nashi homolog B (<i>Drosophila</i>)
3631794	1.17	MYO9A	myosin IXA
7385696	1.17	SHFM1	split hand/foot malformation (ectrodactyly) type 1
3060245	1.17	SLC25A40	solute carrier family 25, member 40
3231389	1.17	ZMYND11	zinc finger, MYND domain containing 11
3076489	1.17	MRPS33	mitochondrial ribosomal protein S33
2417174	1.17	SERBP1	SERPINE1 mRNA binding protein 1
3569926	1.17	DCAF5	DDB1 and CUL4 associated factor 5
2685034	1.17	CGGBP1	CGG triplet repeat binding protein 1
3513293	1.17	SUCLA2	succinate-CoA ligase, ADP-forming, beta subunit
3053380	1.17	ZNF117	zinc finger protein 117
2893847	1.17	SNRNP48	small nuclear ribonucleoprotein 48kDa (U11/U12)
2500722	1.17	ZC3H6	zinc finger CCCH-type containing 6
3111375	1.17	TTC35	tetratricopeptide repeat domain 35
2367154	1.17	PRRC2C	proline-rich coiled-coil 2C
2481142	1.17	MSH6	mutS homolog 6 (<i>E. coli</i>)
3903889	1.17	UQCC	ubiquinol-cytochrome c reductase complex chaperone
3643938	1.17	IFT140	intraflagellar transport 140 homolog (<i>Chlamydomonas</i>)
2688955	1.17	CD200R1	CD200 receptor 1
3378411	1.17	RBM4B	RNA binding motif protein 4B
2727913	1.17	EXOC1	exocyst complex component 1
2385197	1.17	GNPAT	glyceronephosphate O-acyltransferase
2695295	1.17	ASTE1	asteroid homolog 1 (<i>Drosophila</i>)
3479519	1.17	ZNF605	zinc finger protein 605
3548152	1.17	TDP1	tyrosyl-DNA phosphodiesterase 1
3929721	1.17	GART	phosphoribosylglycinamide formyltransferase, phosphoribosylglycinamide synthetase, phosphoribosylaminoimidazole synthetase
3204680	1.17	SIT1	signaling threshold regulating transmembrane adaptor 1
2707359	1.17	DNAJC19	DnaJ (Hsp40) homolog, subfamily C, member 19
3795680	1.17	THOC1	THO complex 1

3003193	1.17	CCT6A	chaperonin containing TCP1, subunit 6A (zeta 1)
2446447	1.17	ACBD6	acyl-CoA binding domain containing 6
3265047	1.17	NHLRC2	NHL repeat containing 2
3719702	1.17	MRPL45	mitochondrial ribosomal protein L45
2545999	1.17	CCDC121	coiled-coil domain containing 121
3223687	1.17	PHF19	PHD finger protein 19
2707824	1.17	MCCC1	methylcrotonoyl-CoA carboxylase 1 (alpha)
2456849	1.17	RAB3GAP2	RAB3 GTPase activating protein subunit 2 (non-catalytic)
3821377	1.17	ZNF441	zinc finger protein 441
2700197	1.17	HLTF	helicase-like transcription factor
3601955	1.17	MPI	mannose phosphate isomerase
3686080	1.17	NSMCE1	non-SMC element 1 homolog (S. cerevisiae)
2331178	1.17	NDUFS5	NADH dehydrogenase (ubiquinone) Fe-S protein 5, 15kDa (NADH-coenzyme Q reductase)
3406015	1.17	ATF7IP	activating transcription factor 7 interacting protein
2867836	1.17	GLRX	glutaredoxin (thioltransferase)
3573078	1.17	VIPAR	VPS33B interacting protein, apical-basolateral polarity regulator
2810458	1.17	GPBP1	GC-rich promoter binding protein 1
3048134	1.17	C7orf44	chromosome 7 open reading frame 44
3575371	1.17	EML5	echinoderm microtubule associated protein like 5
3139035	1.17	ARFGEF1	ADP-ribosylation factor guanine nucleotide-exchange factor 1(brefeldin A-inhibited)
2701927	1.17	SLC33A1	solute carrier family 33 (acetyl-CoA transporter), member 1
3241316	1.17	ZEB1	zinc finger E-box binding homeobox 1
3454331	1.17	LIMA1	LIM domain and actin binding 1
2655773	1.17	POLR2H	polymerase (RNA) II (DNA directed) polypeptide H
2753880	1.17	CDKN2AIP	CDKN2A interacting protein
2824286	1.17	SRP19	signal recognition particle 19kDa
3812426	1.17	RTTN	rotatin
3518086	1.17	TBC1D4	TBC1 domain family, member 4
2897842	1.17	CDKAL1	CDK5 regulatory subunit associated protein 1-like 1
3684782	1.17	CDR2	cerebellar degeneration-related protein 2, 62kDa
3803020	1.17	DSC1	desmocollin 1
3942648	1.17	TUG1	taurine upregulated 1 (non-protein coding)
3797015	1.17	ZFP161	zinc finger protein 161 homolog (mouse)
3355021	1.17	FAM118B	family with sequence similarity 118, member B

2523354	1.17	FAM117B	family with sequence similarity 117, member B
2645951	1.17	TRPC1	transient receptor potential cation channel, subfamily C, member 1
3520989	1.16	TGDS	TDP-glucose 4,6-dehydratase
3909553	1.16	NFATC2	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 2
3428447	1.16	UTP20	UTP20, small subunit (SSU) processome component, homolog (yeast)
3766960	1.16	SMURF2	SMAD specific E3 ubiquitin protein ligase 2
3729294	1.16	RPS6KB1	ribosomal protein S6 kinase, 70kDa, polypeptide 1
2515183	1.16	DCAF17	DDB1 and CUL4 associated factor 17
3786039	1.16	PIK3C3	phosphoinositide-3-kinase, class 3
3061191	1.16	PEX1	peroxisomal biogenesis factor 1
2527939	1.16	BCS1L	BCS1-like (<i>S. cerevisiae</i>)
3834519	1.16	ARHGEF1	Rho guanine nucleotide exchange factor (GEF) 1
3518496	1.16	MYCBP2	MYC binding protein 2
3946351	1.16	ADSL	adenylosuccinate lyase
2741901	1.16	KIAA1109	KIAA1109
3081613	1.16	LMBR1	limb region 1 homolog (mouse)
2664099	1.16	MRPS25	mitochondrial ribosomal protein S25
3889624	1.16	TSHZ2	teashirt zinc finger homeobox 2
2676319	1.16	GLT8D1	glycosyltransferase 8 domain containing 1
3465593	1.16	EEA1	early endosome antigen 1
3430129	1.16	POLR3B	polymerase (RNA) III (DNA directed) polypeptide B
2413943	1.16	USP24	ubiquitin specific peptidase 24
3017123	1.16	PMPCB	peptidase (mitochondrial processing) beta
2925510	1.16	L3MBTL3	l(3)mbt-like 3 (<i>Drosophila</i>)
3449368	1.16	CAPRIN2	caprin family member 2
2966636	1.16	ASCC3	activating signal cointegrator 1 complex subunit 3
3921391	1.16	WRB	tryptophan rich basic protein
3736162	1.16	TMC8	transmembrane channel-like 8
2812120	1.16	CWC27	CWC27 spliceosome-associated protein homolog (<i>S. cerevisiae</i>)
2464129	1.16	AKT3	v-akt murine thymoma viral oncogene homolog 3 (protein kinase B, gamma)
3960827	1.16	SUN2	Sad1 and UNC84 domain containing 2
2734018	1.16	MRPS18C	mitochondrial ribosomal protein S18C
2462511	1.16	HEATR1	HEAT repeat containing 1
2616131	1.16	CCR4	chemokine (C-C motif) receptor 4
3693837	1.16	GOT2	glutamic-oxaloacetic transaminase 2, mitochondrial (aspartate aminotransferase 2)
2891092	1.16	TRIM52	tripartite motif-containing 52

2380785	1.16	LYPLAL1	lysophospholipase-like 1
2687840	1.16	IFT57	intraflagellar transport 57 homolog (Chlamydomonas)
3788302	1.16	SMAD4	SMAD family member 4
3029030	1.16	CASP2	caspase 2, apoptosis-related cysteine peptidase
3302360	1.16	MMS19	MMS19 nucleotide excision repair homolog (S. cerevisiae)
3657318	1.16	ZNF720	zinc finger protein 720
3862018	1.16	RPS16	ribosomal protein S16
3402571	1.16	NCAPD2	non-SMC condensin I complex, subunit D2
3167553	1.16	IL11RA	interleukin 11 receptor, alpha
2542816	1.16	PUM2	pumilio homolog 2 (Drosophila)
2454532	1.16	INTS7	integrator complex subunit 7
2776026	1.16	HELQ	helicase, POLQ-like
2730194	1.16	HTN3	histatin 3
2342391	1.16	TYW3	tRNA-yW synthesizing protein 3 homolog (S. cerevisiae)
3840142	1.16	ZNF480	zinc finger protein 480
2953435	1.16	C6orf130	chromosome 6 open reading frame 130
2408855	1.16	FOXJ3	forkhead box J3
2908100	1.16	POLH	polymerase (DNA directed), eta
2452667	1.16	RAB7L1	RAB7, member RAS oncogene family-like 1
2650393	1.16	PPM1L	protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1L
3000167	1.16	CCM2	cerebral cavernous malformation 2
2599433	1.16	USP37	ubiquitin specific peptidase 37
2978876	1.16	PPIL4	peptidylprolyl isomerase (cyclophilin)-like 4
2808748	1.16	PARP8	poly (ADP-ribose) polymerase family, member 8
3489418	1.16	SETDB2	SET domain, bifurcated 2
3940001	1.16	SPECC1L	sperm antigen with calponin homology and coiled-coil domains 1-like
3070908	1.16	POT1	protection of telomeres 1 homolog (S. pombe)
3945651	1.16	APOBEC3G	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3G
2452637	1.16	NUCKS1	nuclear casein kinase and cyclin-dependent kinase substrate 1
3219547	1.16	IKBKAP	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase complex-associated protein
2332566	1.16	PPCS	phosphopantothenoylcysteine synthetase
2811745	1.16	IPO11	importin 11
3435902	1.16	DDX55	DEAD (Asp-Glu-Ala-Asp) box polypeptide 55
3106539	1.16	OTUD6B	OTU domain containing 6B
2519860	1.16	ASNSD1	asparagine synthetase domain containing 1

2470654	1.16	DDX1	DEAD (Asp-Glu-Ala-Asp) box polypeptide 1
3821323	1.16	ZNF700	zinc finger protein 700
2900423	1.16	ZNF187	zinc finger protein 187
2565262	1.16	SNRNP200	small nuclear ribonucleoprotein 200kDa (U5)
3260829	1.16	FAM178A	family with sequence similarity 178, member A
3169043	1.16	RG9MTD3	RNA (guanine-9-) methyltransferase domain containing 3
3322717	1.16	GTF2H1	general transcription factor IIH, polypeptide 1, 62kDa
3696697	1.16	NOB1	NIN1/RPN12 binding protein 1 homolog (S. cerevisiae)
2848233	1.16	FAM173B	family with sequence similarity 173, member B
2371474	1.16	TSEN15	tRNA splicing endonuclease 15 homolog (S. cerevisiae)
3056044	1.16	BAZ1B	bromodomain adjacent to zinc finger domain, 1B
3361621	1.16	RIC3	resistance to inhibitors of cholinesterase 3 homolog (C. elegans)
2938196	1.16	EXOC2	exocyst complex component 2
3133135	1.16	KAT6A	K(lysine) acetyltransferase 6A
2636185	1.16	SLC35A5	solute carrier family 35, member A5
3449304	1.16	IPO8	importin 8
3409432	1.16	CCDC91	coiled-coil domain containing 91
2768145	1.16	COMMD8	COMM domain containing 8
2929168	1.16	UTRN	utrophin
2358221	1.16	RPRD2	regulation of nuclear pre-mRNA domain containing 2
2855578	1.16	C5orf28	chromosome 5 open reading frame 28
3815649	1.16	CIRBP	cold inducible RNA binding protein
3067080	1.16	COG5	component of oligomeric golgi complex 5
2427930	1.16	WDR77	WD repeat domain 77
3755316	1.16	MLLT6	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 6
2522728	1.16	CASP8	caspase 8, apoptosis-related cysteine peptidase
2901913	1.16	TUBB	tubulin, beta
3661152	1.16	FTO	fat mass and obesity associated
2820622	1.16	ANKRD32	ankyrin repeat domain 32
3451670	1.16	PUS7L	pseudouridylate synthase 7 homolog (S. cerevisiae)-like
2995189	1.16	PLEKHA8	pleckstrin homology domain containing, family A (phosphoinositide binding specific) member 8

3924674	1.16	DIP2A	DIP2 disco-interacting protein 2 homolog A (Drosophila)
3279410	1.16	FAM188A	family with sequence similarity 188, member A
2532110	1.16	DIS3L2	DIS3 mitotic control homolog (S. cerevisiae)-like 2
3066297	1.16	SRPK2	SRSF protein kinase 2
2603897	1.16	TIGD1	tigger transposable element derived 1
3480227	1.16	ZMYM2	zinc finger, MYM-type 2
2869275	1.16	GIN1	gypsy retrotransposon integrase 1
2350551	1.16	SARS	seryl-tRNA synthetase
3386814	1.16	TAF1D	TATA box binding protein (TBP)-associated factor, RNA polymerase I, D, 41kDa
2830010	1.16	SMAD5	SMAD family member 5
2701595	1.16	DHX36	DEAH (Asp-Glu-Ala-His) box polypeptide 36
3072435	1.16	TMEM209	transmembrane protein 209
2770242	1.16	PPAT	phosphoribosyl pyrophosphate amidotransferase
3442176	1.16	ING4	inhibitor of growth family, member 4
3412008	1.16	PPHLN1	periphilin 1
3453319	1.16	DDX23	DEAD (Asp-Glu-Ala-Asp) box polypeptide 23
3867928	1.16	NOSIP	nitric oxide synthase interacting protein
3399545	1.16	NCAPD3	non-SMC condensin II complex, subunit D3
3655574	1.16	SPN	sialophorin
2965674	1.16	NDUFAF4	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, assembly factor 4
3730899	1.16	DDX42	DEAD (Asp-Glu-Ala-Asp) box polypeptide 42
2899298	1.16	BTN3A2	butyrophilin, subfamily 3, member A2
2829337	1.16	PHF15	PHD finger protein 15
2857301	1.16	SLC38A9	solute carrier family 38, member 9
2776088	1.16	FAM175A	family with sequence similarity 175, member A
2447824	1.16	EDEM3	ER degradation enhancer, mannosidase alpha-like 3
3245682	1.16	MAPK8	mitogen-activated protein kinase 8
3278813	1.16	FAM107B	family with sequence similarity 107, member B
3471753	1.16	MAPKAPK5	mitogen-activated protein kinase-activated protein kinase 5
3012819	1.16	CCDC132	coiled-coil domain containing 132
2911413	1.16	PRIM2	primase, DNA, polypeptide 2 (58kDa)
2339740	1.16	EFCAB7	EF-hand calcium binding domain 7
3468261	1.16	NUP37	nucleoporin 37kDa
2454935	1.16	ANGEL2	angel homolog 2 (Drosophila)
3716337	1.16	NSRP1	nuclear speckle splicing regulatory protein 1

2484422	1.16	PEX13	peroxisomal biogenesis factor 13
3659306	1.16	LONP2	lon peptidase 2, peroxisomal
2758076	1.16	NOP14	NOP14 nucleolar protein homolog (yeast)
3857208	1.16	ZNF681	zinc finger protein 681
2512330	1.16	MARCH7	membrane-associated ring finger (C3HC4) 7
2459866	1.16	NUP133	nucleoporin 133kDa
3413643	1.16	CCDC65	coiled-coil domain containing 65
3396144	1.16	C11orf61	chromosome 11 open reading frame 61
2522616	1.16	CFLAR	CASP8 and FADD-like apoptosis regulator
3559766	1.16	HEATR5A	HEAT repeat containing 5A
3191695	1.16	EXOSC2	exosome component 2
2808290	1.16	ZNF131	zinc finger protein 131
2448971	1.16	UCHL5	ubiquitin carboxyl-terminal hydrolase L5
3365136	1.16	SERGEF	secretion regulating guanine nucleotide exchange factor
3223425	1.16	CDK5RAP2	CDK5 regulatory subunit associated protein 2
3164221	1.16	DENND4C	DENN/MADD domain containing 4C
3432138	1.16	MAPKAPK5	mitogen-activated protein kinase-activated protein kinase 5
3447129	1.16	KIAA0528	KIAA0528
2571217	1.16	ZC3H8	zinc finger CCCH-type containing 8
3917204	1.16	C21orf7	chromosome 21 open reading frame 7
2692573	1.16	CCDC14	coiled-coil domain containing 14
2413423	1.16	TMEM48	transmembrane protein 48
2887633	1.16	BOD1	biorientation of chromosomes in cell division 1
2971378	1.16	GOPC	golgi-associated PDZ and coiled-coil motif containing
3498837	1.16	PCCA	propionyl CoA carboxylase, alpha polypeptide
3788833	1.16	POLI	polymerase (DNA directed) iota
2534456	1.15	LRRFIP1	leucine rich repeat (in FLII) interacting protein 1
2476116	1.15	SLC30A6	solute carrier family 30 (zinc transporter), member 6
2353749	1.15	CD101	CD101 molecule
3196691	1.15	KIAA0020	KIAA0020
2523635	1.15	CYP20A1	cytochrome P450, family 20, subfamily A, polypeptide 1
3576266	1.15	LOC283588	hypothetical LOC283588
2853768	1.15	NUP155	nucleoporin 155kDa
2762468	1.15	DCAF16	DDB1 and CUL4 associated factor 16
2754371	1.15	CCDC111	coiled-coil domain containing 111
3149754	1.15	EIF3H	eukaryotic translation initiation factor 3, subunit H
2916345	1.15	SLC35A1	solute carrier family 35 (CMP-sialic acid transporter), member A1
3387771	1.15	CCDC82	coiled-coil domain containing 82
2901818	1.15	MRPS18B	mitochondrial ribosomal protein S18B

3340913	1.15	C11orf30	chromosome 11 open reading frame 30
3332938	1.15	SDHAF2	succinate dehydrogenase complex assembly factor 2
2862716	1.15	GFM2	G elongation factor, mitochondrial 2
2644202	1.15	IL20RB	interleukin 20 receptor beta
2461786	1.15	ARID4B	AT rich interactive domain 4B (RBP1-like)
3891643	1.15	C20orf177	chromosome 20 open reading frame 177
2477372	1.15	C2orf56	chromosome 2 open reading frame 56
3883547	1.15	PHF20	PHD finger protein 20
2544164	1.15	C2orf44	chromosome 2 open reading frame 44
3627422	1.15	RORA	RAR-related orphan receptor A
3741075	1.15	METTL16	methyltransferase like 16
2523689	1.15	ABI2	abl-interactor 2
3462094	1.15	ZFC3H1	zinc finger, C3H1-type containing
2882555	1.15	FAM114A2	family with sequence similarity 114, member A2
2964771	1.15	MAP3K7	mitogen-activated protein kinase kinase kinase 7
2962525	1.15	IBTK	inhibitor of Bruton agammaglobulinemia tyrosine kinase
2832052	1.15	HARS2	histidyl-tRNA synthetase 2, mitochondrial (putative)
2434527	1.15	GOLPH3L	golgi phosphoprotein 3-like
3699178	1.15	WDR59	WD repeat domain 59
3512769	1.15	ZC3H13	zinc finger CCCH-type containing 13
2525272	1.15	PIKFYVE	phosphoinositide kinase, FYVE finger containing
2756497	1.15	ATP5I	ATP synthase, H ⁺ transporting, mitochondrial Fo complex, subunit E
3345774	1.15	JRKL	jerky homolog-like (mouse)
3793588	1.15	C18orf55	chromosome 18 open reading frame 55
2655113	1.15	KLHL24	kelch-like 24 (Drosophila)
2819044	1.15	RASA1	RAS p21 protein activator (GTPase activating protein) 1
3503164	1.15	CDC16	cell division cycle 16 homolog (S. cerevisiae)
2346934	1.15	MTF2	metal response element binding transcription factor 2
3091848	1.15	HMBOX1	homeobox containing 1
2456805	1.15	BPNT1	3'(2'), 5'-bisphosphate nucleotidase 1
3147321	1.15	UBR5	ubiquitin protein ligase E3 component n-recognin 5
3427352	1.15	NEDD1	neural precursor cell expressed, developmentally down-regulated 1
3148796	1.15	NUDCD1	NudC domain containing 1
2696802	1.15	STAG1	stromal antigen 1
3818648	1.15	ZNF557	zinc finger protein 557
3216529	1.15	ZNF782	zinc finger protein 782

2773023	1.15	ANKRD17	ankyrin repeat domain 17
3036985	1.15	RNF216	ring finger protein 216
2433209	1.15	PRKAB2	protein kinase, AMP-activated, beta 2 non-catalytic subunit
3523156	1.15	TMTC4	transmembrane and tetratricopeptide repeat containing 4
2428760	1.15	RSBN1	round spermatid basic protein 1
3444958	1.15	DUSP16	dual specificity phosphatase 16
3957589	1.15	MORC2	MORC family CW-type zinc finger 2
3074101	1.15	C7orf49	chromosome 7 open reading frame 49
3685306	1.15	NDUFAB1	NADH dehydrogenase (ubiquinone) 1, alpha/beta subcomplex, 1, 8kDa
3085270	1.15	TNKS	tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymerase
3444329	1.15	TAS2R10	taste receptor, type 2, member 10
2859775	1.15	SGTB	small glutamine-rich tetratricopeptide repeat (TPR)-containing, beta
3831620	1.15	ZNF568	zinc finger protein 568
2873168	1.15	CEP120	centrosomal protein 120kDa
2821347	1.15	ERAP2	endoplasmic reticulum aminopeptidase 2
2957126	1.15	MCM3	minichromosome maintenance complex component 3
2721809	1.15	ZCCHC4	zinc finger, CCHC domain containing 4
3285614	1.15	ZNF25	zinc finger protein 25
3926138	1.15	C21orf91	chromosome 21 open reading frame 91
3074362	1.15	CNOT4	CCR4-NOT transcription complex, subunit 4
2615360	1.15	TGFBR2	transforming growth factor, beta receptor II (70/80kDa)
3866958	1.15	CARD8	caspase recruitment domain family, member 8
2676518	1.15	SFMBT1	Scm-like with four mbt domains 1
3383322	1.15	NARS2	asparaginyl-tRNA synthetase 2, mitochondrial (putative)
3372459	1.15	FNBP4	formin binding protein 4
3617920	1.15	ATPBD4	ATP binding domain 4
3106310	1.15	DECR1	2,4-dienoyl CoA reductase 1, mitochondrial
2521556	1.15	MARS2	methionyl-tRNA synthetase 2, mitochondrial
2345880	1.15	LRRC8B	leucine rich repeat containing 8 family, member B
3393200	1.15	PCSK7	proprotein convertase subtilisin/kexin type 7
2404254	1.15	PUM1	pumilio homolog 1 (Drosophila)
3114878	1.15	NSMCE2	non-SMC element 2, MMS21 homolog (S. cerevisiae)
3424379	1.15	C12orf26	chromosome 12 open reading frame 26
2758658	1.15	TMEM128	transmembrane protein 128
2997097	1.15	SEPT7	septin 7
3778252	1.15	ANKRD12	ankyrin repeat domain 12
3461164	1.15	MDM1	Mdm1 nuclear protein homolog (mouse)

3752611	1.15	C17orf75	chromosome 17 open reading frame 75
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Supplemental Table 4. Genes down-regulated in *HbSS* subjects by > 1.15 fold at FDR 0.05.

Genotype	Direction	Dataset	ID	Annotation	Fold Enrichment	P_{adjust}
<i>Hb SS</i>	up regulation	KEGG	hsa04640	Hematopoietic cell lineage	3.60	0.00077
			hsa04621	NOD-like receptor signaling pathway	3.41	0.027
			hsa04610	Complement and coagulation cascades	3.27	0.031
		GO	GO:0006954	inflammatory response	3.65	1.2E-14
			GO:0009617	response to bacterium	3.97	1.9E-08
			GO:0006935	chemotaxis	4.00	4.5E-07
			GO:0043066	negative regulation of apoptosis	2.58	3.7E-06
			GO:0002237	response to molecule of bacterial origin	4.60	6.1E-06
			GO:0001817	regulation of cytokine production	3.28	1.2E-05
			GO:0032496	response to lipopolysaccharide	4.60	2.6E-05
			GO:0042060	wound healing	3.00	8.5E-05
			GO:0009615	response to virus	3.84	0.00012
			GO:0048660	regulation of smooth muscle cell proliferation	5.70	0.00013
			GO:0050900	leukocyte migration	5.05	0.00017
			GO:0032642	regulation of chemokine production	9.82	0.00037
			GO:0015669	gas transport	10.7	0.00090
			GO:0050865	regulation of cell activation	2.73	0.0015
			GO:0000302	response to reactive oxygen species	3.91	0.0021
			GO:0048872	homeostasis of number of cells	3.43	0.0022
			GO:0040017	positive regulation of locomotion	3.35	0.0027
			GO:0045087	innate immune response	2.92	0.0029
			GO:0051101	regulation of DNA binding	3.01	0.0030
			GO:0048821	erythrocyte development	11.0	0.0032
			GO:0007599	hemostasis	3.20	0.0040
			GO:0045637	regulation of myeloid cell differentiation	3.68	0.0055
			GO:0045765	regulation of angiogenesis	3.88	0.0061
			GO:0007596	blood coagulation	3.17	0.0065
	down regulation	KEGG	hsa04660	T cell receptor signaling pathway	3.88	6.0E-07
			hsa00970	aminoacyl-tRNA biosynthesis	4.54	2.7E-03
			hsa04742	Taste transduction	3.94	7.4E-03
			hsa04110	cell cycle	2.52	1.0E-02
			GO:0051249	regulation of lymphocyte activation	2.69	0.00042
			GO:0042110	T cell activation	2.74	0.00081
			GO:0051028	mRNA transport	3.10	0.0069
			GO:0030098	lymphocyte differentiation	2.55	0.018

	regulation	GO	GO:0002696	positive regulation of leukocyte activation	2.52	0.019
			GO:0002704	negative regulation of leukocyte mediated immunity	10.5	0.023
			GO:0050657	nucleic acid transport	2.69	0.029
			GO:0051236	establishment of RNA localization	2.69	0.029
			GO:0050658	RNA transport	2.69	0.029
<i>VHL</i> ^{R200W}	up regulation	GO	GO:0006954	inflammatory response	2.92	0.0020
			GO:0009615	response to virus	4.88	0.0028
			GO:0032496	response to lipopolysaccharide	5.29	0.0052
			GO:0043066	negative regulation of apoptosis	2.57	0.0077
			GO:0002237	response to molecule of bacterial origin	4.76	0.0061
			GO:0009617	response to bacterium	3.32	0.013
			GO:0006935	chemotaxis	3.44	0.026
	down regulation	KEGG	hsa04660	T cell receptor signaling pathway	3.28	0.00014
			hsa03040	Spliceosome	2.85	0.0014
		GO	GO:0006396	RNA processing	2.53	2.1E-14
			GO:0051028	mRNA transport	2.96	0.027
			GO:0050657	nucleic acid transport	2.74	0.033
			GO:0050658	RNA transport	2.74	0.033
			GO:0051236	establishment of RNA localization	2.74	0.033

Supplemental Table 5. Enrichment of differentially expressed genes in KEGG pathways and GO biological process ($P_{adjusted} < 0.05$, fold enrichment > 2.5). P values were adjusted by Benjamini & Hochberg method.

	<i>VHL</i> wildtype		<i>VHL</i> ^{R200W} homozygote		P-value
	N	Median (IQR)	N	Median (IQR)	
Age (years)	16	42 (30, 56)	15	49 (34, 59)	0.9
Female gender n (%)	16	8 (50)	15	9 (60)	0.7
Systolic blood pressure (mm Hg)	16	122 (118, 127)	15	109 (102, 129)	0.17
Diastolic blood pressure (mm Hg)	16	82 (78, 86)	15	79 (74, 90)	0.6
Pulse pressure (mm Hg)	16	40 (37, 47)	15	37 (31, 41)	0.2
Hemoglobin (g/dl)	16	13.2 (12.4, 14.3)	15	18.6 (16.9, 19.1)	<0.001
White blood cells (1000/ul)	17	6 (5.4, 6.5)	13	10.5 (9.6, 11.5)	<0.001
Platelets (1000/ul)	16	262 (211, 304)	15	215 (180, 286)	0.14
Erythropoietin (IU/l)	16	6.5 (5.4, 9.4)	15	48.4 (16.4, 72.3)	<0.001
Ferritin (µg/l)	16	64 (29, 80)	15	35 (30, 55)	0.15
Tricuspid regurgitation velocity (m/sec)	16	2.2 (1.8, 2.3)	15	2.4 (2.3, 2.9)	0.01

Supplemental Table 6. Summary for the clinical covariates between *VHL* wildtype and *VHL*^{R200W} homozygous individuals in the CP cohort. P value represents Wilcoxon's rank sum test for continuous covariates and Fisher's exact test for categorical covariates.

AffyID	Fold Change <i>HbSS</i>	Fold Change <i>VHL</i> ^{R200W}	Gene Symbol	Gene Annotation
3759006	4.68	2.41	SLC4A1	solute carrier family 4, anion exchanger, member 1 (erythrocyte membrane protein band 3, Diego blood group)
3142967	4.60	2.81	CA1	carbonic anhydrase I
3360401	4.40	1.81	HBB	hemoglobin, beta
2435005	4.17	2.63	SELENBP1	selenium binding protein 1
3657253	3.29	2.09	AHSP	alpha hemoglobin stabilizing protein
2571510	3.18	1.72	IL1B	interleukin 1, beta
3090006	3.13	2.05	SLC25A37	solute carrier family 25, member 37
2777714	3.06	1.84	SNCA	synuclein, alpha (non A4 component of amyloid precursor)
2353988	3.05	1.71	FAM46C	family with sequence similarity 46, member C
3360417	2.98	1.81	HBD	hemoglobin, delta
3809621	2.93	1.81	FECH	ferrochelatase
3090053	2.81	2.02	SLC25A37	solute carrier family 25, member 37
2773434	2.81	1.18	CXCL2	chemokine (C-X-C motif) ligand 2
3621029	2.77	1.82	EPB42	erythrocyte membrane protein band 4.2
3025500	2.75	1.86	BPGM	2,3-bisphosphoglycerate mutase
3203855	2.71	2.04	DCAF12	DDB1 and CUL4 associated factor 12
3830484	2.42	1.17	FFAR2	free fatty acid receptor 2
3902489	2.38	1.85	BCL2L1	BCL2-like 1
3642654	2.28	1.48	HBM	hemoglobin, mu
3444252	2.27	2.18	CSDA	cold shock domain protein A
2788003	2.20	1.40	GYPA	glycophorin A (MNS blood group)
3257204	2.19	1.61	IFIT3	interferon-induced protein with tetratricopeptide repeats 3
3066818	2.19	1.24	NAMPT	nicotinamide phosphoribosyltransferase
3561039	2.15	1.31	NFKBIA	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha
2468351	2.13	1.30	RSAD2	radical S-adenosyl methionine domain containing 2
2672096	2.10	1.22	CCR1	chemokine (C-C motif) receptor 1
3945515	2.04	1.41	APOBEC3A	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3A
2990464	2.02	1.41	ARL4A	ADP-ribosylation factor-like 4A
2775390	2.02	1.44	RASGEF1B	RasGEF domain family, member 1B
2830861	2.01	1.28	EGR1	early growth response 1

3257246	1.98	1.41	IFIT1	interferon-induced protein with tetratricopeptide repeats 1
3286921	1.98	1.49	MARCH8	membrane-associated ring finger (C3HC4) 8
3549575	1.97	1.54	IFI27	interferon, alpha-inducible protein 27
3091000	1.95	1.39	BNIP3L	BCL2/adenovirus E1B 19kDa interacting protein 3-like
3257192	1.95	1.31	IFIT2	interferon-induced protein with tetratricopeptide repeats 2
3595594	1.92	1.20	AQP9	aquaporin 9
3942531	1.91	1.60	OSBP2	oxysterol binding protein 2
3181240	1.90	1.60	TMOD1	tropomodulin 1
2451463	1.89	1.54	ADIPOR1	adiponectin receptor 1
3759077	1.88	1.65	SLC25A39	solute carrier family 25, member 39
3703885	1.86	1.35	SLC7A5	solute carrier family 7 (cationic amino acid transporter, y+ system), member 5
2927506	1.86	1.21	TNFAIP3	tumor necrosis factor, alpha-induced protein 3
3905875	1.85	1.35	MAFB	v-maf musculoaponeurotic fibrosarcoma oncogene homolog B (avian)
3147508	1.83	1.20	KLF10	Kruppel-like factor 10
2343473	1.82	1.49	IFI44L	interferon-induced protein 44-like
2347732	1.80	1.38	TMEM56-RWDD3	transmembrane protein 56
3214451	1.77	1.17	NFIL3	nuclear factor, interleukin 3 regulated
3217077	1.77	1.28	HEMGN	hemogen
3836266	1.77	1.53	FOSB	FBJ murine osteosarcoma viral oncogene homolog B
3838004	1.77	1.34	PPP1R15A	protein phosphatase 1, regulatory (inhibitor) subunit 15A
3680610	1.75	1.31	GSPT1	G1 to S phase transition 1
3132940	1.75	1.42	ANK1	ankyrin 1, erythrocytic
2390050	1.75	1.18	NLRP3	NLR family, pyrin domain containing 3
3352503	1.73	1.28	ARHGEF12	Rho guanine nucleotide exchange factor (GEF) 12
3781654	1.72	1.40	RIOK3	RIO kinase 3 (yeast)
2896545	1.71	1.60	GMPR	guanosine monophosphate reductase
2325274	1.71	1.37	PITHD1	chromosome 1 open reading frame 128
2953570	1.71	1.18	TREM1	triggering receptor expressed on myeloid cells 1
3246372	1.71	1.38	NCOA4	nuclear receptor coactivator 4
2321058	1.70	1.18	PRAMEF2	PRAME family member 2
3786868	1.70	1.56	SLC14A1	solute carrier family 14 (urea transporter), member 1 (Kidd blood group)

3943414	1.69	1.40	FBXO7	F-box protein 7
2982319	1.69	1.23	SOD2	superoxide dismutase 2, mitochondrial
3815014	1.66	1.45	BSG	basigin (Ok blood group)
3253880	1.66	1.25	PPIF	peptidylprolyl isomerase F
3434413	1.64	1.52	RNF10	ring finger protein 10
2439373	1.63	1.27	SPTA1	spectrin, alpha, erythrocytic 1 (elliptocytosis 2)
3089102	1.62	1.43	EPB49	erythrocyte membrane protein band 4.9 (dematin)
3527514	1.62	1.49	PNP	purine nucleoside phosphorylase
3864551	1.62	1.23	PLAUR	plasminogen activator, urokinase receptor
2669930	1.61	1.17	CSRNP1	cysteine-serine-rich nuclear protein 1
3568534	1.61	1.43	SPTB	spectrin, beta, erythrocytic
3761725	1.60	1.42	PHOSPHO1	phosphatase, orphan 1
3862661	1.59	1.41	BLVRB	biliverdin reductase B (flavin reductase (NADPH))
3841862	1.59	1.28	FCAR	Fc fragment of IgA, receptor for
3115008	1.59	1.27	TRIB1	tribbles homolog 1 (Drosophila)
2778856	1.58	1.37	TSPAN5	tetraspanin 5
3890597	1.58	1.40	RBM38	RNA binding motif protein 38
3944129	1.57	1.22	HMOX1	heme oxygenase (decycling) 1
3837257	1.57	1.31	C5AR1	complement component 5a receptor 1
2895792	1.57	1.30	RNF182	ring finger protein 182
2401448	1.55	1.20	E2F2	E2F transcription factor 2
3331355	1.55	1.30	SERPING1	serpin peptidase inhibitor, clade G (C1 inhibitor), member 1
3724505	1.54	1.42	MYL4	myosin, light chain 4, alkali; atrial, embryonic
3237548	1.54	1.16	ARL5B	ADP-ribosylation factor-like 5B
3212919	1.53	1.30	ISCA1	iron-sulfur cluster assembly 1 homolog (S. cerevisiae)
3771543	1.53	1.25	UBE2O	ubiquitin-conjugating enzyme E2O
2975014	1.51	1.23	SGK1	serum/glucocorticoid regulated kinase 1
2442698	1.51	1.27	CREG1	cellular repressor of E1A-stimulated genes 1
3299469	1.50	1.22	ANKRD22	ankyrin repeat domain 22
7385547	1.49	1.21	CCL2	chemokine (C-C motif) ligand 2
3820443	1.49	1.26	ICAM1	intercellular adhesion molecule 1
2403261	1.49	1.29	IFI6	interferon, alpha-inducible protein 6
2731513	1.48	1.36	EREG	epiregulin
2707764	1.47	1.23	DCUN1D1	DCN1, defective in cullin neddylation 1, domain containing 1 (S. cerevisiae)
3543979	1.47	1.34	C14orf45	chromosome 14 open reading frame 45

3922100	1.47	1.33	MX1	myxovirus (influenza virus) resistance 1, interferon-inducible protein p78 (mouse)
3125571	1.47	1.20	MSR1	macrophage scavenger receptor 1
2948630	1.46	1.21	IER3	immediate early response 3
3722872	1.46	1.31	RUNDC3A	RUN domain containing 3A
3832978	1.45	1.27	ZFP36	zinc finger protein 36, C3H type, homolog (mouse)
3770345	1.45	1.53	CD300E	CD300e molecule
3550077	1.45	1.41	GLRX5	glutaredoxin 5
2379132	1.45	1.25	ATF3	activating transcription factor 3
2737840	1.44	1.50	CISD2	CDGSH iron sulfur domain 2
2833024	1.44	1.16	RNF14	ring finger protein 14
3740664	1.44	1.16	MIR22HG	MIR22 host gene
3215146	1.44	1.22	NINJ1	ninjurin 1
3759137	1.44	1.25	ITGA2B	integrin, alpha 2b (platelet glycoprotein IIb of IIb/IIIa complex, antigen CD41)
3475782	1.44	1.24	HCAR2	hydroxycarboxylic acid receptor 2
3364306	1.44	1.28	SOX6	SRY (sex determining region Y)-box 6
2902416	1.43	1.26	TNF	tumor necrosis factor
3894322	1.43	1.24	SRXN1	sulfiredoxin 1
3464860	1.42	1.57	DUSP6	dual specificity phosphatase 6
3223928	1.42	1.30	STOM	stomatin
2599153	1.42	1.26	TNS1	tensin 1
3714729	1.42	1.44	MAP2K3	mitogen-activated protein kinase kinase 3
3791935	1.42	1.17	SERPINB2	serpin peptidase inhibitor, clade B (ovalbumin), member 2
3511698	1.42	1.17	EPSTI1	epithelial stromal interaction 1 (breast)
2875348	1.42	1.25	IRF1	interferon regulatory factor 1
2363689	1.41	1.22	FCGR2A	Fc fragment of IgG, low affinity IIa, receptor (CD32)
3320123	1.41	1.19	ADM	adrenomedullin
3850676	1.41	1.22	KANK2	KN motif and ankyrin repeat domains 2
3432467	1.40	1.32	OAS3	2'-5'-oligoadenylate synthetase 3, 100kDa
2447066	1.40	1.18	GLUL	glutamate-ammonia ligase
2403446	1.40	1.20	PTAFR	platelet-activating factor receptor
3594129	1.40	1.17	MAPK6	mitogen-activated protein kinase 6
2828479	1.40	1.23	SLC22A4	solute carrier family 22 (organic cation/ergothioneine transporter), member 4
3351841	1.40	1.19	HMBS	hydroxymethylbilane synthase
3474831	1.39	1.26	OASL	2'-5'-oligoadenylate synthetase-like

3869237	1.39	1.16	FPR1	formyl peptide receptor 1
3672830	1.39	1.29	MAP1LC3B	microtubule-associated protein 1 light chain 3 beta
3320717	1.39	1.42	MICAL2	microtubule associated monooxygenase, calponin and LIM domain containing 2
3695867	1.39	1.27	RANBP10	RAN binding protein 10
2882834	1.39	1.20	C5orf4	chromosome 5 open reading frame 4
2731373	1.39	1.47	PF4V1	platelet factor 4 variant 1
3669059	1.38	1.25	GABARAPL2	GABA(A) receptor-associated protein-like 2
3855071	1.38	1.41	FKBP8	FK506 binding protein 8, 38kDa
3502710	1.38	1.18	TFDP1	transcription factor Dp-1
3945006	1.38	1.21	H1F0	H1 histone family, member 0
3263624	1.37	1.28	MXI1	MAX interactor 1
2708922	1.37	1.25	IGF2BP2	insulin-like growth factor 2 mRNA binding protein 2
2922215	1.37	1.26	MARCKS	myristoylated alanine-rich protein kinase C substrate
3821015	1.36	1.19	LDLR	low density lipoprotein receptor
3816509	1.36	1.16	GADD45B	growth arrest and DNA-damage-inducible, beta
3320819	1.36	1.28	MICALCL	MICAL C-terminal like
4050485	1.35	1.20	TUBB2C	tubulin, beta 2C
3866276	1.35	1.28	SLC1A5	solute carrier family 1 (neutral amino acid transporter), member 5
3936330	1.35	1.17	C22orf37	chromosome 22 open reading frame 37
3124537	1.34	1.22	CTSB	cathepsin B
3942472	1.34	1.18	TCN2	transcobalamin II
3233605	1.34	1.18	PFKFB3	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3
3349918	1.34	1.22	RBM7	RNA binding motif protein 7
3190190	1.34	1.19	LCN2	lipocalin 2
3955327	1.34	1.24	C22orf13	chromosome 22 open reading frame 13
2929127	1.34	1.18	STX11	syntaxin 11
3714177	1.33	1.21	SPECC1	sperm antigen with calponin homology and coiled-coil domains 1
3822216	1.33	1.20	IER2	immediate early response 2
3724545	1.33	1.19	ITGB3	integrin, beta 3 (platelet glycoprotein IIIa, antigen CD61)
3742285	1.33	1.21	CXCL16	chemokine (C-X-C motif) ligand 16
3316208	1.33	1.22	TALDO1	transaldolase 1
3263743	1.33	1.17	DUSP5	dual specificity phosphatase 5
3957003	1.32	1.31	ASCC2	activating signal cointegrator 1 complex subunit 2
3966000	1.32	1.31	TYMP	thymidine phosphorylase

3076178	1.32	1.20	MKRN1	makorin ring finger protein 1
3757329	1.32	1.23	JUP	junction plakoglobin
3591327	1.32	1.16	CCNDBP1	cyclin D-type binding-protein 1
3061484	1.32	1.17	HEPACAM2	HEPACAM family member 2
3735752	1.32	1.19	SEC14L1	SEC14-like 1 (<i>S. cerevisiae</i>)
3443183	1.31	1.19	CLEC4E	C-type lectin domain family 4, member E
3874636	1.31	1.21	SMOX	spermine oxidase
3579546	1.31	1.22	WARS	tryptophanyl-tRNA synthetase
3274361	1.31	1.27	KLF6	Kruppel-like factor 6
3822122	1.31	1.22	NFIX	nuclear factor I/X (CCAAT-binding transcription factor)
3638607	1.31	1.41	ANPEP	alanyl (membrane) aminopeptidase
3302240	1.31	1.18	RRP12	ribosomal RNA processing 12 homolog (<i>S. cerevisiae</i>)
3642687	1.30	1.24	HBQ1	hemoglobin, theta 1
3119945	1.30	1.28	GRINA	glutamate receptor, ionotropic, N-methyl D-aspartate-associated protein 1 (glutamate binding)
3556386	1.30	1.25	RAB2B	RAB2B, member RAS oncogene family
3043264	1.30	1.18	JAZF1	JAZF zinc finger 1
3432438	1.30	1.26	OAS1	2',5'-oligoadenylate synthetase 1, 40/46kDa
3844855	1.30	1.27	C19orf22	chromosome 19 open reading frame 22
2700828	1.30	1.29	SIAH2	seven in absentia homolog 2 (<i>Drosophila</i>)
3846783	1.29	1.37	UBXN6	UBX domain protein 6
3442706	1.29	1.19	CD163	CD163 molecule
2974592	1.29	1.16	VNN1	vanin 1
3456666	1.29	1.32	NFE2	nuclear factor (erythroid-derived 2), 45kDa
3358950	1.29	1.23	CTSD	cathepsin D
3890109	1.29	1.27	C20orf108	chromosome 20 open reading frame 108
3157660	1.29	1.46	TSTA3	tissue specific transplantation antigen P35B
3895614	1.28	1.19	SIGLEC1	sialic acid binding Ig-like lectin 1, sialoadhesin
3204558	1.28	1.16	KIAA1539	KIAA1539
3873389	1.28	1.29	PSMF1	proteasome (prosome, macropain) inhibitor subunit 1 (PI31)
3119339	1.28	1.16	LY6E	lymphocyte antigen 6 complex, locus E
3740462	1.28	1.24	RILP	Rab interacting lysosomal protein
3839910	1.28	1.28	FPR2	formyl peptide receptor 2

4053534	1.28	1.19	ISG15	ISG15 ubiquitin-like modifier
3771037	1.28	1.22	WBP2	WW domain binding protein 2
3873629	1.28	1.23	SIRPA	signal-regulatory protein alpha
3203482	1.27	1.22	BAG1	BCL2-associated athanogene
2539125	1.27	1.21	CMPK2	cytidine monophosphate (UMP-CMP) kinase 2, mitochondrial
2359439	1.27	1.30	LCE1D	late cornified envelope 1D
3866605	1.27	1.20	NAPA	N-ethylmaleimide-sensitive factor attachment protein, alpha
3851840	1.27	1.23	KLF1	Kruppel-like factor 1 (erythroid)
3676165	1.27	1.27	HAGH	hydroxyacylglutathione hydrolase
3377988	1.26	1.15	FOSL1	FOS-like antigen 1
3708074	1.26	1.16	XAF1	XIAP associated factor 1
2327659	1.26	1.15	OPRD1	opioid receptor, delta 1
2905404	1.26	1.17	PIM1	pim-1 oncogene
3536706	1.26	1.18	LGALS3	lectin, galactoside-binding, soluble, 3
3457160	1.26	1.18	CD63	CD63 molecule
3291601	1.26	1.16	EGR2	early growth response 2
3185498	1.26	1.38	SLC31A2	solute carrier family 31 (copper transporters), member 2
3608398	1.26	1.22	FURIN	furin (paired basic amino acid cleaving enzyme)
2370355	1.25	1.18	IER5	immediate early response 5
3883921	1.25	1.19	MYL9	myosin, light chain 9, regulatory
3219215	1.25	1.35	KLF4	Kruppel-like factor 4 (gut)
2400655	1.25	1.28	RAP1GAP	RAP1 GTPase activating protein
3922037	1.25	1.18	MX2	myxovirus (influenza virus) resistance 2 (mouse)
3739431	1.25	1.17	METRNL	meteorin, glial cell differentiation regulator-like
2505404	1.25	1.23	MZT2B	mitotic spindle organizing protein 2B
3598165	1.25	1.17	PLEKHO2	pleckstrin homology domain containing, family O member 2
3835726	1.25	1.15	BCL3	B-cell CLL/lymphoma 3
3769969	1.25	1.17	FAM104A	family with sequence similarity 104, member A
3851055	1.24	1.22	ELOF1	elongation factor 1 homolog (S. cerevisiae)
3814978	1.24	1.27	CDC34	cell division cycle 34 homolog (S. cerevisiae)
2324097	1.24	1.24	PINK1	PTEN induced putative kinase 1
2777276	1.24	1.18	ABCG2	ATP-binding cassette, sub-family G (WHITE), member 2
3721400	1.24	1.16	EIF1	eukaryotic translation initiation factor 1

3256074	1.24	1.17	BMPR1A	bone morphogenetic protein receptor, type IA
3738629	1.24	1.20	SLC16A3	solute carrier family 16, member 3 (monocarboxylic acid transporter 4)
3173673	1.24	1.15	PIP5K1B	phosphatidylinositol-4-phosphate 5-kinase, type I, beta
3638590	1.24	1.18	MESP1	mesoderm posterior 1 homolog (mouse)
3433466	1.24	1.16	NCRNA00173	non-protein coding RNA 173
3722917	1.24	1.28	GRN	granulin
3186966	1.23	1.19	TLR4	toll-like receptor 4
2502686	1.23	1.15	MARCO	macrophage receptor with collagenous structure
3500787	1.23	1.16	TNFSF13B	tumor necrosis factor (ligand) superfamily, member 13b
3722338	1.23	1.23	IFI35	interferon-induced protein 35
3740367	1.23	1.17	SLC43A2	solute carrier family 43, member 2
3400034	1.23	1.20	WNK1	WNK lysine deficient protein kinase 1
3824874	1.23	1.20	IFI30	interferon, gamma-inducible protein 30
2618598	1.23	1.17	EIF1B	eukaryotic translation initiation factor 1B
3674886	1.23	1.28	NPRL3	nitrogen permease regulator-like 3 (S. cerevisiae)
3014229	1.22	1.21	BRI3	brain protein I3
3905145	1.22	1.17	TGM2	transglutaminase 2 (C polypeptide, protein-glutamine-gamma-glutamyltransferase)
3529725	1.22	1.16	REC8	REC8 homolog (yeast)
3250278	1.22	1.25	HK1	hexokinase 1
3373962	1.22	1.19	UBE2L6	ubiquitin-conjugating enzyme E2L 6
2504328	1.22	1.32	GYPC	glycophorin C (Gerbich blood group)
3708858	1.22	1.23	CD68	CD68 molecule
3743486	1.22	1.19	GABARAP	GABA(A) receptor-associated protein
3226661	1.21	1.21	ZER1	zer-1 homolog (C. elegans)
3822074	1.21	1.21	RAD23A	RAD23 homolog A (S. cerevisiae)
3841621	1.21	1.17	LILRB4	leukocyte immunoglobulin-like receptor, subfamily B (with TM and ITIM domains), member 4
3432514	1.21	1.16	OAS2	2'-5'-oligoadenylate synthetase 2, 69/71kDa
2492938	1.21	1.16	RPIA	ribose 5-phosphate isomerase A
3894727	1.21	1.24	SIRPB1	signal-regulatory protein beta 1
2420427	1.20	1.22	GNG5	guanine nucleotide binding protein (G protein), gamma 5
3937130	1.20	1.16	C22orf25	chromosome 22 open reading frame 25

3527722	1.20	1.22	RNASE2	ribonuclease, RNase A family, 2 (liver, eosinophil-derived neurotoxin)
3727712	1.20	1.20	PCTP	phosphatidylcholine transfer protein
3683276	1.20	1.18	GDE1	glycerophosphodiester phosphodiesterase 1
3375091	1.20	1.18	SLC15A3	solute carrier family 15, member 3
3590341	1.20	1.17	CHP	calcium binding protein P22
3553531	1.20	1.17	TNFAIP2	tumor necrosis factor, alpha-induced protein 2
3818860	1.20	1.27	MCOLN1	mucolipin 1
3227121	1.19	1.20	C9orf78	chromosome 9 open reading frame 78
3936550	1.19	1.16	USP18	ubiquitin specific peptidase 18
2946383	1.19	1.19	HIST1H4H	histone cluster 1, H4h
3358174	1.19	1.18	IRF7	interferon regulatory factor 7
2623922	1.19	1.18	STAB1	stabilin 1
3228545	1.19	1.19	OBP2B	odorant binding protein 2B
3852022	1.19	1.24	LYL1	lymphoblastic leukemia derived sequence 1
2902804	1.18	1.19	C2	complement component 2
3261255	1.18	1.16	DPCD	deleted in primary ciliary dyskinesia homolog (mouse)
3962530	1.18	1.16	CYB5R3	cytochrome b5 reductase 3
2571075	1.18	1.15	ANAPC1	anaphase promoting complex subunit 1
3774906	1.18	1.33	SECTM1	secreted and transmembrane 1
3557811	1.18	1.17	PSME2	proteasome (prosome, macropain) activator subunit 2 (PA28 beta)
3860137	1.18	1.22	TYROBP	TYRO protein tyrosine kinase binding protein
3771642	1.17	1.24	CYGB	cytoglobin
3569257	1.17	1.30	PLEK2	pleckstrin 2
3629206	1.17	1.17	OAZ2	ornithine decarboxylase antizyme 2
2438531	1.17	1.17	HDGF	hepatoma-derived growth factor
3428671	1.17	1.25	CHPT1	choline phosphotransferase 1
3219621	1.16	1.16	CTNNAL1	catenin (cadherin-associated protein), alpha-like 1
3741528	1.16	1.17	TAX1BP3	Tax1 (human T-cell leukemia virus type I) binding protein 3
3802980	1.16	1.23	DSC2	desmocollin 2
2899102	1.16	1.23	HIST1H3C	histone cluster 1, H3c
3439732	1.16	1.24	NINJ2	ninjurin 2
3322775	1.16	1.23	LDHA	lactate dehydrogenase A
3473436	1.15	1.25	TESC	tescalcin
3820161	1.15	1.17	UBL5	ubiquitin-like 5
3193339	1.15	1.23	RXRA	retinoid X receptor, alpha
3725779	1.15	1.15	KAT7	K(lysine) acetyltransferase 7

3902372	1.15	1.16	FLJ45832	FLJ45832 protein
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Supplemental Table 7. Hypoxia induced genes in both *HbSS* and homozygous *VHL*^{R200W}.

AffyID	Fold Change <i>HbSS</i>	Fold Change <i>VHL^{R200W}</i>	Gene Symbol	Gene Annotation
3031517	2.15	1.61	GIMAP7	GTPase, IMAP family member 7
2781138	1.86	1.61	LEF1	lymphoid enhancer-binding factor 1
3451814	1.84	1.46	NELL2	NEL-like 2 (chicken)
2464484	1.70	1.35	FAM36A	family with sequence similarity 36, member A
3393744	1.69	1.24	CD3D	CD3d molecule, delta (CD3-TCR complex)
3756319	1.65	1.35	CCR7	chemokine (C-C motif) receptor 7
3351300	1.63	1.23	CD3G	CD3g molecule, gamma (CD3-TCR complex)
2427791	1.63	1.33	DENND2D	DENN/MADD domain containing 2D
2806468	1.63	1.62	IL7R	interleukin 7 receptor
2823880	1.62	1.45	CAMK4	calcium/calmodulin-dependent protein kinase IV
2515627	1.57	1.50	ITGA6	integrin, alpha 6
3727928	1.56	1.39	NOG	noggin
3027956	1.54	1.20	TAS2R4	taste receptor, type 2, member 4
3617458	1.52	1.52	GOLGA8A	golgin A8 family, member A
2496536	1.51	1.65	RPL31	ribosomal protein L31
2566414	1.51	1.41	MGAT4A	mannosyl (alpha-1,3-)-glycoprotein beta-1,4-N-acetylglucosaminyltransferase, isozyme A
2837232	1.50	1.44	ITK	IL2-inducible T-cell kinase
2741236	1.50	1.44	USP53	ubiquitin specific peptidase 53
2831591	1.48	1.25	C5orf53	chromosome 5 open reading frame 53
2829171	1.48	1.28	TCF7	transcription factor 7 (T-cell specific, HMG-box)
3446868	1.48	1.44	LDHB	lactate dehydrogenase B
3351280	1.48	1.16	CD3E	CD3e molecule, epsilon (CD3-TCR complex)
3450861	1.47	1.30	ABCD2	ATP-binding cassette, sub-family D (ALD), member 2
2862841	1.47	1.42	GCNT4	glucosaminyl (N-acetyl) transferase 4, core 2
2612625	1.46	1.37	OXNAD1	oxidoreductase NAD-binding domain containing 1
2389062	1.46	1.55	FAM36A	family with sequence similarity 36, member A
3666146	1.45	1.28	SLC7A6	solute carrier family 7 (cationic amino acid transporter, y+ system), member 6

3402506	1.45	1.20	CD27	CD27 molecule
2353669	1.45	1.19	CD2	CD2 molecule
2756404	1.45	1.45	ZNF721	zinc finger protein 721
3456955	1.45	1.28	KIAA0748	KIAA0748
2768354	1.44	1.40	TXK	TXK tyrosine kinase
3347658	1.44	1.36	ATM	ataxia telangiectasia mutated
3576704	1.44	1.37	TC2N	tandem C2 domains, nuclear
2325479	1.44	1.39	RCAN3	RCAN family member 3
2349129	1.43	1.29	S1PR1	sphingosine-1-phosphate receptor 1
2458513	1.43	1.30	TMEM63A	transmembrane protein 63A
3831260	1.43	1.29	ZNF146	zinc finger protein 146
3138464	1.42	1.36	PDE7A	phosphodiesterase 7A
3387708	1.42	1.24	MAML2	MAML2 mastermind-like 2 (Drosophila)
3041260	1.42	1.26	TOMM7	translocase of outer mitochondrial membrane 7 homolog (yeast)
2378121	1.41	1.31	TRAF3IP3	TRAF3 interacting protein 3
2525852	1.41	1.30	RPE	ribulose-5-phosphate-3-epimerase
3404436	1.41	1.33	CLEC2D	C-type lectin domain family 2, member D
2440258	1.41	1.29	SLAMF6	SLAM family member 6
3563317	1.40	1.33	RPS29	ribosomal protein S29
2654306	1.39	1.35	TTC14	tetratricopeptide repeat domain 14
3430125	1.39	1.26	TCP11L2	t-complex 11 (mouse)-like 2
3850501	1.39	1.31	LOC147727	hypothetical LOC147727
2665199	1.39	1.52	SATB1	SATB homeobox 1
2635741	1.39	1.32	CD96	CD96 molecule
2902736	1.39	1.46	C6orf48	chromosome 6 open reading frame 48
3522398	1.38	1.26	DOCK9	dedicator of cytokinesis 9
3268274	1.38	1.19	PLEKHA1	pleckstrin homology domain containing, family A (phosphoinositide binding specific) member 1
3279108	1.38	1.27	NMT2	N-myristoyltransferase 2
2562965	1.38	1.18	CD8B	CD8b molecule
3314040	1.38	1.28	BNIP3	BCL2/adenovirus E1B 19kDa interacting protein 3
2977265	1.38	1.44	HIVEP2	human immunodeficiency virus type I enhancer binding protein 2
2558150	1.38	1.28	AAK1	AP2 associated kinase 1
2339139	1.38	1.31	INADL	InaD-like (Drosophila)
2464005	1.37	1.36	AKT3	v-akt murine thymoma viral oncogene homolog 3 (protein kinase B, gamma)
2635349	1.37	1.37	TRAT1	T cell receptor associated transmembrane adaptor 1
2482505	1.37	1.33	SPTBN1	spectrin, beta, non-erythrocytic 1

3726772	1.37	1.29	LUC7L3	LUC7-like 3 (<i>S. cerevisiae</i>)
2864449	1.37	1.32	SERINC5	serine incorporator 5
3618736	1.37	1.23	RASGRP1	RAS guanyl releasing protein 1 (calcium and DAG-regulated)
2831932	1.37	1.44	IK	IK cytokine, down-regulator of HLA II
2348792	1.37	1.27	CCDC76	coiled-coil domain containing 76
2809793	1.37	1.51	GZMK	granzyme K (granzyme 3; tryptase II)
3417075	1.36	1.20	DGKA	diacylglycerol kinase, alpha 80kDa
3321512	1.36	1.31	PDE3B	phosphodiesterase 3B, cGMP-inhibited
2656837	1.36	1.35	ST6GAL1	ST6 beta-galactosamide alpha-2,6-sialyltransferase 1
3528646	1.36	1.21	TRAV8-3	T cell receptor alpha variable 8-3
3362934	1.36	1.28	ZBED5	zinc finger, BED-type containing 5
3957790	1.36	1.16	PIK3IP1	phosphoinositide-3-kinase interacting protein 1
2945741	1.36	1.30	FAM65B	family with sequence similarity 65, member B
3894601	1.36	1.16	FKBP1A	FK506 binding protein 1A, 12kDa
2857416	1.36	1.26	IL6ST	interleukin 6 signal transducer (gp130, oncostatin M receptor)
3226253	1.36	1.18	FAM102A	family with sequence similarity 102, member A
3930525	1.36	1.16	RUNX1	chromosome 21 open reading frame 96
2475678	1.35	1.26	LBH	limb bud and heart development homolog (mouse)
3390067	1.35	1.28	NPAT	nuclear protein, ataxia-telangiectasia locus
3486883	1.35	1.21	NAA16	N(alpha)-acetyltransferase 16, NatA auxiliary subunit
3889419	1.35	1.22	TSHZ2	teashirt zinc finger homeobox 2
2452977	1.35	1.35	FAIM3	Fas apoptotic inhibitory molecule 3
3544251	1.35	1.22	YLPM1	YLP motif containing 1
2565935	1.35	1.18	ANKRD36B	ankyrin repeat domain 36B
3285926	1.35	1.19	ZNF33B	zinc finger protein 33B
3826041	1.35	1.17	ZNF253	zinc finger protein 253
2360206	1.35	1.20	ATP8B2	ATPase, class I, type 8B, member 2
2349402	1.34	1.32	AMY2B	amylase, alpha 2B (pancreatic)
3840372	1.34	1.20	ZNF701	zinc finger protein 701
2837266	1.34	1.17	CYFIP2	cytoplasmic FMR1 interacting protein 2
3761164	1.34	1.26	SKAP1	src kinase associated phosphoprotein 1
3869650	1.34	1.21	ZNF83	zinc finger protein 83
2326463	1.34	1.18	CD52	CD52 molecule
2663083	1.34	1.25	C3orf31	chromosome 3 open reading frame 31

3862167	1.34	1.22	FBL	fibrillarin
2817941	1.34	1.32	RASGRF2	Ras protein-specific guanine nucleotide-releasing factor 2
2679014	1.33	1.42	FHIT	fragile histidine triad
2558511	1.33	1.28	TIA1	TIA1 cytotoxic granule-associated RNA binding protein
3089853	1.33	1.28	CHMP7	CHMP family, member 7
2437753	1.33	1.20	KIAA0907	KIAA0907
2787459	1.33	1.40	INPP4B	inositol polyphosphate-4-phosphatase, type II, 105kDa
2523801	1.33	1.31	CD28	CD28 molecule
2770193	1.33	1.19	AASDH	aminoadipate-semialdehyde dehydrogenase
3092276	1.33	1.35	LEPROTL1	leptin receptor overlapping transcript-like 1
3444476	1.33	1.19	TAS2R20	taste receptor, type 2, member 20
2773907	1.33	1.35	SDAD1	SDA1 domain containing 1
2457573	1.32	1.20	MIA3	melanoma inhibitory activity family, member 3
3568080	1.32	1.26	WDR89	WD repeat domain 89
3755862	1.32	1.16	IKZF3	IKAROS family zinc finger 3 (Aiolos)
2619344	1.32	1.34	NKTR	natural killer-tumor recognition sequence
3136129	1.32	1.17	RPS20	ribosomal protein S20
3661065	1.32	1.30	RBL2	retinoblastoma-like 2 (p130)
2951916	1.32	1.23	STK38	serine/threonine kinase 38
2961300	1.32	1.51	COX7A2	cytochrome c oxidase subunit VIIa polypeptide 2 (liver)
2488114	1.32	1.32	ZNF638	zinc finger protein 638
2688605	1.32	1.21	GCET2	germinal center expressed transcript 2
3768969	1.32	1.21	ABCA5	ATP-binding cassette, sub-family A (ABC1), member 5
2713950	1.32	1.29	ZNF141	zinc finger protein 141
2355591	1.32	1.27	PDE4DIP	phosphodiesterase 4D interacting protein
3517793	1.31	1.18	KLF12	Kruppel-like factor 12
2622359	1.31	1.26	RBM6	RNA binding motif protein 6
3408573	1.31	1.20	LYRM5	LYR motif containing 5
3910260	1.31	1.23	ZNF217	zinc finger protein 217
2526759	1.31	1.19	ATIC	5-aminoimidazole-4-carboxamide ribonucleotide formyltransferase/IMP cyclohydrolase
3445768	1.31	1.18	ERP27	endoplasmic reticulum protein 27
2614120	1.31	1.40	RPL15	ribosomal protein L15
3001479	1.31	1.17	IKZF1	IKAROS family zinc finger 1 (Ikaros)

3849773	1.31	1.23	ZNF121	zinc finger protein 121
3031556	1.31	1.36	GIMAP2	GTPase, IMAP family member 2
3918959	1.30	1.18	MRPS6	mitochondrial ribosomal protein S6
2973856	1.30	1.21	SAMD3	sterile alpha motif domain containing 3
2666904	1.30	1.28	SLC4A7	solute carrier family 4, sodium bicarbonate cotransporter, member 7
3856184	1.30	1.18	ZNF626	zinc finger protein 626
3020804	1.30	1.25	NAA38	N(alpha)-acetyltransferase 38, NatC auxiliary subunit
2587790	1.30	1.20	GPR155	G protein-coupled receptor 155
2550959	1.30	1.31	PREPL	prolyl endopeptidase-like
3292448	1.30	1.20	HERC4	hect domain and RLD 4
3397589	1.30	1.31	ETS1	v-ets erythroblastosis virus E26 oncogene homolog 1 (avian)
3053229	1.30	1.25	ZNF680	zinc finger protein 680
2979056	1.30	1.21	NUP43	nucleoporin 43kDa
2474651	1.30	1.25	ZNF512	zinc finger protein 512
3105777	1.30	1.30	WWP1	WW domain containing E3 ubiquitin protein ligase 1
2425447	1.29	1.28	DPH5	DPH5 homolog (S. cerevisiae)
2915828	1.29	1.15	NT5E	5'-nucleotidase, ecto (CD73)
3780271	1.29	1.32	C18orf1	chromosome 18 open reading frame 1
2849992	1.29	1.23	FAM134B	family with sequence similarity 134, member B
3257031	1.29	1.21	STAMBPL1	STAM binding protein-like 1
2484552	1.29	1.23	AHSA2	AHA1, activator of heat shock 90kDa protein ATPase homolog 2 (yeast)
3494706	1.29	1.18	SLAIN1	SLAIN motif family, member 1
3031533	1.29	1.22	GIMAP4	GTPase, IMAP family member 4
3480013	1.29	1.21	MPHOSPH8	M-phase phosphoprotein 8
2809810	1.29	1.18	GZMA	granzyme A (granzyme 1, cytotoxic T-lymphocyte-associated serine esterase 3)
3280224	1.29	1.19	NSUN6	NOP2/Sun domain family, member 6
2879927	1.29	1.26	LARS	leucyl-tRNA synthetase
3498476	1.29	1.21	UBAC2	UBA domain containing 2
3399623	1.28	1.30	THYN1	thymocyte nuclear protein 1
2420958	1.28	1.30	ZNHIT6	zinc finger, HIT-type containing 6
2788926	1.28	1.20	NR3C2	nuclear receptor subfamily 3, group C, member 2
2785035	1.28	1.20	MFS8	major facilitator superfamily domain containing 8
3829857	1.28	1.18	ZNF302	zinc finger protein 302
2607020	1.28	1.27	MTERFD2	MTERF domain containing 2
3403077	1.28	1.22	C12orf57	chromosome 12 open reading frame 57

2519756	1.28	1.30	WDR75	WD repeat domain 75
3275922	1.28	1.17	PRKCQ	protein kinase C, theta
2828135	1.28	1.26	LYRM7	Lyrm7 homolog (mouse)
3754677	1.28	1.22	SYNRG	synergisin, gamma
2444790	1.28	1.19	MRPS14	mitochondrial ribosomal protein S14
3091403	1.28	1.18	EPHX2	epoxide hydrolase 2, cytoplasmic
2688717	1.28	1.33	BTLA	B and T lymphocyte associated
3389745	1.28	1.26	CWF19L2	CWF19-like 2, cell cycle control (S. pombe)
2978050	1.28	1.24	SHPRH	SNF2 histone linker PHD RING helicase
2344393	1.28	1.28	PRKACB	protein kinase, cAMP-dependent, catalytic, beta
3666282	1.28	1.19	ZFP90	zinc finger protein 90 homolog (mouse)
3452231	1.28	1.31	SLC38A1	solute carrier family 38, member 1
2812273	1.28	1.37	PPWD1	peptidylprolyl isomerase domain and WD repeat containing 1
2867693	1.28	1.31	TTC37	tetratricopeptide repeat domain 37
2964350	1.28	1.22	MDN1	MDN1, midasin homolog (yeast)
3589410	1.28	1.22	C15orf54	chromosome 15 open reading frame 54
2916952	1.27	1.28	CASP8AP2	caspase 8 associated protein 2
2325410	1.27	1.19	NIPAL3	NIPA-like domain containing 3
2774565	1.27	1.32	CNOT6L	CCR4-NOT transcription complex, subunit 6-like
2924619	1.27	1.23	TRMT11	tRNA methyltransferase 11 homolog (S. cerevisiae)
2515707	1.27	1.29	PDK1	pyruvate dehydrogenase kinase, isozyme 1
2418000	1.27	1.27	ZRANB2	zinc finger, RAN-binding domain containing 2
2475710	1.27	1.21	LCLAT1	lysocardiolipin acyltransferase 1
2478748	1.27	1.34	EML4	echinoderm microtubule associated protein like 4
2821417	1.27	1.28	LNPEP	leucyl/cystinyl aminopeptidase
2592005	1.27	1.18	HIBCH	3-hydroxyisobutyryl-CoA hydrolase
2704894	1.27	1.28	PHC3	polyhomeotic homolog 3 (Drosophila)
2491935	1.27	1.25	PTCD3	Pentatricopeptide repeat domain 3
3413067	1.27	1.16	FAM113B	family with sequence similarity 113, member B
3731826	1.27	1.19	PRKCA	protein kinase C, alpha
3576812	1.27	1.21	TRIP11	thyroid hormone receptor interactor 11
3617830	1.27	1.21	ZNF770	zinc finger protein 770
2789266	1.27	1.31	LRBA	LPS-responsive vesicle trafficking, beach and anchor containing

3929821	1.27	1.17	CRYZL1	crystallin, zeta (quinone reductase)-like 1
2859667	1.27	1.31	CENPK	centromere protein K
3831698	1.27	1.17	ZNF420	zinc finger protein 420
3444503	1.26	1.27	TAS2R31	taste receptor, type 2, member 31
3061046	1.26	1.24	KRIT1	KRIT1, ankyrin repeat containing
3243078	1.26	1.29	ZNF33A	zinc finger protein 33A
3068476	1.26	1.28	TMEM168	transmembrane protein 168
2638988	1.26	1.38	PARP15	poly (ADP-ribose) polymerase family, member 15
3755903	1.26	1.15	GSDMB	gasdermin B
3857171	1.26	1.31	ZNF675	zinc finger protein 675
3307939	1.26	1.18	ABLIM1	actin binding LIM protein 1
2993206	1.26	1.17	MPP6	membrane protein, palmitoylated 6 (MAGUK p55 subfamily member 6)
2440295	1.26	1.15	CD84	CD84 molecule
3210179	1.26	1.19	C9orf95	chromosome 9 open reading frame 95
3181417	1.26	1.34	ANP32B	acidic (leucine-rich) nuclear phosphoprotein 32 family, member B
3828887	1.26	1.30	ZNF507	zinc finger protein 507
3849688	1.26	1.20	ZNF266	zinc finger protein 266
2329669	1.26	1.15	ZMYM1	zinc finger, MYM-type 1
3180717	1.26	1.21	C9orf102	chromosome 9 open reading frame 102
2550542	1.26	1.25	THADA	thyroid adenoma associated
2635263	1.26	1.24	DZIP3	DAZ interacting protein 3, zinc finger
2713837	1.26	1.25	ZNF718	zinc finger protein 718
2427688	1.26	1.17	LRIF1	ligand dependent nuclear receptor interacting factor 1
3641871	1.25	1.18	LINS	lines homolog (Drosophila)
3011977	1.25	1.23	GTPBP10	GTP-binding protein 10 (putative)
2687739	1.25	1.25	CD47	CD47 molecule
2698844	1.25	1.25	ATR	ataxia telangiectasia and Rad3 related
2378662	1.25	1.28	TRAF5	TNF receptor-associated factor 5
3268669	1.25	1.18	BUB3	budding uninhibited by benzimidazoles 3 homolog (yeast)
3568310	1.25	1.16	ZBTB25	zinc finger and BTB domain containing 25
3645947	1.25	1.17	CLUAP1	clusterin associated protein 1
3828162	1.25	1.18	C19orf2	chromosome 19 open reading frame 2
2966253	1.25	1.29	PNISR	PNN-interacting serine/arginine-rich protein
2462456	1.25	1.20	HEATR1	HEAT repeat containing 1
3766861	1.25	1.16	POLG2	polymerase (DNA directed), gamma 2, accessory subunit

2346738	1.25	1.17	RPAP2	RNA polymerase II associated protein 2
3857105	1.25	1.30	ZNF91	zinc finger protein 91
2348896	1.25	1.28	CDC14A	CDC14 cell division cycle 14 homolog A (S. cerevisiae)
3831774	1.25	1.18	ZNF383	zinc finger protein 383
2488785	1.25	1.22	ALMS1	Alstrom syndrome 1
2592356	1.25	1.22	STAT4	signal transducer and activator of transcription 4
2865050	1.25	1.16	RPS23	ribosomal protein S23
3214668	1.25	1.19	IARS	isoleucyl-tRNA synthetase
3554851	1.25	1.34	CRIP1	cysteine-rich protein 1 (intestinal)
2443450	1.25	1.41	SELL	selectin L
3647827	1.25	1.23	ATF7IP2	activating transcription factor 7 interacting protein 2
2418451	1.25	1.21	CRYZ	crystallin, zeta (quinone reductase)
2645579	1.25	1.30	RASA2	RAS p21 protein activator 2
2659918	1.25	1.24	LRCH3	leucine-rich repeats and calponin homology (CH) domain containing 3
2508611	1.25	1.41	ARHGAP15	Rho GTPase activating protein 15
2728448	1.25	1.26	POLR2B	polymerase (RNA) II (DNA directed) polypeptide B, 140kDa
3766893	1.25	1.38	DDX5	DEAD (Asp-Glu-Ala-Asp) box polypeptide 5
2825629	1.25	1.28	TNFAIP8	tumor necrosis factor, alpha-induced protein 8
2922840	1.25	1.38	KPNA5	karyopherin alpha 5 (importin alpha 6)
3966225	1.25	1.19	RABL2B	RAB, member of RAS oncogene family-like 2B
3519119	1.25	1.22	RBM26	RNA binding motif protein 26
2638728	1.25	1.17	SLC15A2	solute carrier family 15 (H ⁺ /peptide transporter), member 2
3013178	1.25	1.25	CASD1	CAS1 domain containing 1
2990342	1.24	1.32	TMEM106B	transmembrane protein 106B
3195344	1.24	1.21	MRPL41	mitochondrial ribosomal protein L41
2498977	1.24	1.38	GCC2	GRIP and coiled-coil domain containing 2
2521574	1.24	1.26	PLCL1	phospholipase C-like 1
3325263	1.24	1.18	DNAJC24	DnaJ (Hsp40) homolog, subfamily C, member 24
2523419	1.24	1.21	ALS2CR8	amyotrophic lateral sclerosis 2 (juvenile) chromosome region, candidate 8
2971564	1.24	1.25	C6orf204	chromosome 6 open reading frame 204
3920385	1.24	1.16	TTC3	tetratricopeptide repeat domain 3
3094514	1.24	1.24	DDHD2	DDHD domain containing 2

3518977	1.24	1.16	RNF219	ring finger protein 219
2736259	1.24	1.26	SMARCAD1	SWI/SNF-related, matrix-associated actin-dependent regulator of chromatin, subfamily a, containing DEAD/H box 1
3200982	1.24	1.22	MLLT3	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 3
3199790	1.24	1.21	PSIP1	PC4 and SFRS1 interacting protein 1
2980812	1.24	1.20	TFB1M	transcription factor B1, mitochondrial
2382781	1.24	1.21	SRP9	signal recognition particle 9kDa
3217807	1.24	1.15	TEX10	testis expressed 10
3764103	1.24	1.17	SRSF1	serine/arginine-rich splicing factor 1
2767378	1.24	1.27	ATP8A1	ATPase, aminophospholipid transporter (APLT), class I, type 8A, member 1
2402111	1.24	1.23	C1orf63	chromosome 1 open reading frame 63
2705266	1.24	1.20	TNIK	TRAF2 and NCK interacting kinase
2914820	1.24	1.22	BCKDHB	branched chain keto acid dehydrogenase E1, beta polypeptide
3932148	1.24	1.21	BRWD1	bromodomain and WD repeat domain containing 1
2502424	1.24	1.19	INSIG2	insulin induced gene 2
2566645	1.24	1.29	MITD1	MIT, microtubule interacting and transport, domain containing 1
3494137	1.24	1.17	LMO7	LIM domain 7
2594569	1.24	1.20	ORC2	origin recognition complex, subunit 2
2358700	1.24	1.19	GABPB2	GA binding protein transcription factor, beta subunit 2
3027915	1.24	1.28	SSBP1	single-stranded DNA binding protein 1
2591942	1.24	1.20	ORMDL1	ORM1-like 1 (S. cerevisiae)
2768654	1.24	1.22	OCIAD2	OCIA domain containing 2
2419046	1.24	1.26	ZZZ3	zinc finger, ZZ-type containing 3
3096428	1.24	1.21	FNTA	farnesyltransferase, CAAX box, alpha
2580304	1.24	1.25	ORC4	origin recognition complex, subunit 4
2601648	1.24	1.30	DOCK10	dedicator of cytokinesis 10
2744597	1.23	1.25	NAA15	N(alpha)-acetyltransferase 15, NatA auxiliary subunit
2427619	1.23	1.26	KCNA3	potassium voltage-gated channel, shaker-related subfamily, member 3
2968652	1.23	1.22	SESN1	sestrin 1
2387006	1.23	1.23	MTR	5-methyltetrahydrofolate-homocysteine methyltransferase
2550790	1.23	1.33	LRPPRC	leucine-rich PPR-motif containing
2394784	1.23	1.22	NOL9	nucleolar protein 9
2916246	1.23	1.20	C6orf162	chromosome 6 open reading frame 162

3060917	1.23	1.17	MTERF	mitochondrial transcription termination factor
2591906	1.23	1.17	OSGEPL1	O-sialoglycoprotein endopeptidase-like 1
2414998	1.23	1.24	MYSM1	Myb-like, SWIRM and MPN domains 1
3175597	1.23	1.21	VPS13A	vacuolar protein sorting 13 homolog A (<i>S. cerevisiae</i>)
2601021	1.23	1.27	FARSB	phenylalanyl-tRNA synthetase, beta subunit
3638068	1.23	1.16	DET1	de-etiolated homolog 1 (<i>Arabidopsis</i>)
3645816	1.23	1.17	ZNF75A	zinc finger protein 75a
2636483	1.23	1.19	SIDT1	SID1 transmembrane family, member 1
2999485	1.23	1.28	STK17A	serine/threonine kinase 17a
2928874	1.23	1.20	PEX3	peroxisomal biogenesis factor 3
3124333	1.23	1.15	XKR6	XK, Kell blood group complex subunit-related family, member 6
2766122	1.23	1.17	KLF3	Kruppel-like factor 3 (basic)
2666478	1.23	1.35	TOP2B	topoisomerase (DNA) II beta 180kDa
2891052	1.23	1.16	GNB2L1	guanine nucleotide binding protein (G protein), beta polypeptide 2-like 1
2893130	1.23	1.17	FARS2	phenylalanyl-tRNA synthetase 2, mitochondrial
3065963	1.23	1.21	ORC5	origin recognition complex, subunit 5
3534201	1.23	1.18	PRPF39	PRP39 pre-mRNA processing factor 39 homolog (<i>S. cerevisiae</i>)
3476012	1.23	1.17	MPHOSPH9	M-phase phosphoprotein 9
2585701	1.23	1.16	STK39	serine threonine kinase 39
2593464	1.23	1.28	ANKRD44	ankyrin repeat domain 44
2401347	1.23	1.20	TCEA3	transcription elongation factor A (SII), 3
2963929	1.23	1.24	RNGTT	RNA guanylyltransferase and 5'-phosphatase
3537967	1.23	1.19	KIAA0586	KIAA0586
3187577	1.23	1.25	CNTRL	centriolin
2863049	1.22	1.16	POC5	POC5 centriolar protein homolog (<i>Chlamydomonas</i>)
2780734	1.22	1.27	TBCK	TBC1 domain containing kinase
2345929	1.22	1.18	LRRC8C	leucine rich repeat containing 8 family, member C
2493858	1.22	1.19	MAL	mal, T-cell differentiation protein
2695701	1.22	1.18	NPHP3	nephronophthisis 3 (adolescent)
2324743	1.22	1.19	ZBTB40	zinc finger and BTB domain containing 40
2520291	1.22	1.21	GLS	glutaminase

2589291	1.22	1.20	TTN	titin
3004628	1.22	1.20	ZNF107	zinc finger protein 107
3144760	1.22	1.18	RBM12B	RNA binding motif protein 12B
3764933	1.22	1.17	TUBD1	tubulin, delta 1
2976626	1.22	1.25	REPS1	RALBP1 associated Eps domain containing 1
2681753	1.22	1.34	FOXP1	forkhead box P1
2331213	1.22	1.20	MACF1	microtubule-actin crosslinking factor 1
3299255	1.22	1.16	ATAD1	ATPase family, AAA domain containing 1
3410384	1.22	1.31	C12orf35	chromosome 12 open reading frame 35
2748198	1.22	1.23	KIAA0922	KIAA0922
2480992	1.22	1.21	MSH2	mutS homolog 2, colon cancer, nonpolyposis type 1 (E. coli)
2518743	1.22	1.18	NUP35	nucleoporin 35kDa
3505319	1.22	1.17	SACS	spastic ataxia of Charlevoix-Saguenay (sacsin)
3514685	1.22	1.17	NCRNA00282	non-protein coding RNA 282
2648141	1.22	1.21	MBNL1	muscleblind-like (Drosophila)
2555277	1.22	1.28	USP34	ubiquitin specific peptidase 34
2732611	1.22	1.22	MRPL1	mitochondrial ribosomal protein L1
2996321	1.22	1.23	BBS9	Bardet-Biedl syndrome 9
3835494	1.22	1.15	ZNF226	zinc finger protein 226
2656738	1.22	1.32	EIF4A2	eukaryotic translation initiation factor 4A2
2660648	1.22	1.23	CRBN	cereblon
2422885	1.22	1.18	GLMN	glomulin, FKBP associated protein
2689516	1.22	1.18	ZBTB20	zinc finger and BTB domain containing 20
2724671	1.22	1.29	RHOH	ras homolog gene family, member H
3190558	1.22	1.18	SPTAN1	spectrin, alpha, non-erythrocytic 1 (alpha-fodrin)
2735459	1.22	1.21	HERC3	hect domain and RLD 3
2585236	1.22	1.22	TTC21B	tetratricopeptide repeat domain 21B
2558483	1.22	1.17	C2orf42	chromosome 2 open reading frame 42
2362351	1.22	1.15	PYHIN1	pyrin and HIN domain family, member 1
3087813	1.21	1.28	PCM1	pericentriolar material 1
3627363	1.21	1.18	NARG2	NMDA receptor regulated 2
3929395	1.21	1.17	GCFC1	GC-rich sequence DNA-binding factor 1
2990043	1.21	1.24	PHF14	PHD finger protein 14
3421177	1.21	1.19	NUP107	nucleoporin 107kDa
2742134	1.21	1.19	SPATA5	spermatogenesis associated 5

2842101	1.21	1.19	SFXN1	sideroflexin 1
2746024	1.21	1.23	ABCE1	ATP-binding cassette, sub-family E (OABP), member 1
2913594	1.21	1.19	MTO1	mitochondrial translation optimization 1 homolog (<i>S. cerevisiae</i>)
2739160	1.21	1.44	CCDC109B	coiled-coil domain containing 109B
2478928	1.21	1.19	MTA3	metastasis associated 1 family, member 3
2726828	1.21	1.19	DCUN1D4	DCN1, defective in cullin neddylation 1, domain containing 4 (<i>S. cerevisiae</i>)
2796790	1.21	1.22	KIAA1430	KIAA1430
2476411	1.21	1.22	TTC27	tetratricopeptide repeat domain 27
3692928	1.21	1.24	BBS2	Bardet-Biedl syndrome 2
2574884	1.21	1.17	IWS1	IWS1 homolog (<i>S. cerevisiae</i>)
2934801	1.21	1.17	MAP3K4	mitogen-activated protein kinase kinase kinase 4
3842675	1.21	1.15	ZNF542	zinc finger protein 542
2824483	1.21	1.22	YTHDC2	YTH domain containing 2
2677723	1.21	1.16	ARHGEF3	Rho guanine nucleotide exchange factor (GEF) 3
2974188	1.21	1.24	MED23	mediator complex subunit 23
2915268	1.21	1.21	DOPEY1	dopey family member 1
2743029	1.21	1.21	C4orf29	chromosome 4 open reading frame 29
2829488	1.21	1.25	DDX46	DEAD (Asp-Glu-Ala-Asp) box polypeptide 46
3268588	1.21	1.21	ACADSB	acyl-CoA dehydrogenase, short/branched chain
2456746	1.21	1.20	EPRS	glutamyl-prolyl-tRNA synthetase
2348634	1.21	1.17	AGL	amylase-1, 6-glucosidase, 4-alpha-glucanotransferase
3538470	1.21	1.17	C14orf135	chromosome 14 open reading frame 135
3485863	1.21	1.19	EXOSC8	exosome component 8
2476219	1.21	1.23	BIRC6	baculoviral IAP repeat-containing 6
3263555	1.21	1.23	ADD3	adducin 3 (gamma)
2811656	1.21	1.29	KIF2A	kinesin heavy chain member 2A
2589868	1.21	1.25	CCDC141	coiled-coil domain containing 141
2737069	1.21	1.17	METAP1	methionyl aminopeptidase 1
2965739	1.21	1.15	MMS22L	MMS22-like, DNA repair protein
3831475	1.21	1.16	ZNF382	zinc finger protein 382
2855434	1.21	1.17	C5orf39	chromosome 5 open reading frame 39
3837464	1.21	1.15	GLTSCR2	glioma tumor suppressor candidate region gene 2
2969201	1.21	1.20	AKD1	adenylate kinase domain containing 1

2639309	1.21	1.18	SEC22A	SEC22 vesicle trafficking protein homolog A (<i>S. cerevisiae</i>)
2695648	1.21	1.21	ACAD11	acyl-CoA dehydrogenase family, member 11
3091628	1.21	1.17	ELP3	elongation protein 3 homolog (<i>S. cerevisiae</i>)
3249788	1.21	1.19	CCAR1	cell division cycle and apoptosis regulator 1
3322251	1.21	1.22	NUCB2	nucleobindin 2
2400322	1.21	1.20	HP1BP3	heterochromatin protein 1, binding protein 3
2517549	1.21	1.15	RBM45	RNA binding motif protein 45
2458017	1.21	1.17	NVL	nuclear VCP-like
3539724	1.21	1.18	SYNE2	spectrin repeat containing, nuclear envelope 2
2354082	1.21	1.16	WDR3	WD repeat domain 3
3051395	1.21	1.19	SEC61G	Sec61 gamma subunit
2413153	1.21	1.17	C1orf123	chromosome 1 open reading frame 123
3243708	1.21	1.15	BMS1	BMS1 homolog, ribosome assembly protein (yeast)
2443537	1.20	1.19	SCYL3	SCY1-like 3 (<i>S. cerevisiae</i>)
2437645	1.20	1.21	GON4L	gon-4-like (<i>C. elegans</i>)
2875419	1.20	1.19	KIF3A	kinesin family member 3A
2895159	1.20	1.28	HIVEP1	human immunodeficiency virus type I enhancer binding protein 1
3683050	1.20	1.18	SMG1	SMG1 homolog, phosphatidylinositol 3-kinase-related kinase (<i>C. elegans</i>)
2682568	1.20	1.18	SHQ1	SHQ1 homolog (<i>S. cerevisiae</i>)
2695200	1.20	1.16	PIK3R4	phosphoinositide-3-kinase, regulatory subunit 4
3368520	1.20	1.18	CSTF3	cleavage stimulation factor, 3' pre-RNA, subunit 3, 77kDa
2439001	1.20	1.17	FCRL3	Fc receptor-like 3
3888133	1.20	1.19	CSE1L	CSE1 chromosome segregation 1-like (yeast)
2911944	1.20	1.26	PHF3	PHD finger protein 3
2343170	1.20	1.20	FAM73A	family with sequence similarity 73, member A
3082248	1.20	1.17	ESYT2	extended synaptotagmin-like protein 2
2341565	1.20	1.24	SRSF11	serine/arginine-rich splicing factor 11
2349086	1.20	1.15	DPH5	DPH5 homolog (<i>S. cerevisiae</i>)
2779486	1.20	1.20	H2AFZ	H2A histone family, member Z
2461473	1.20	1.23	TARBP1	TAR (HIV-1) RNA binding protein 1
3562003	1.20	1.16	TRAPPC6B	trafficking protein particle complex 6B
2617041	1.20	1.26	GOLGA4	golgin A4

2510485	1.20	1.25	RIF1	RAP1 interacting factor homolog (yeast)
2814527	1.20	1.24	BDP1	B double prime 1, subunit of RNA polymerase III transcription initiation factor IIIB
3509910	1.20	1.18	FAM48A	family with sequence similarity 48, member A
2339682	1.20	1.22	ALG6	asparagine-linked glycosylation 6, alpha-1,3-glucosyltransferase homolog (S. cerevisiae)
2418929	1.20	1.22	PIGK	phosphatidylinositol glycan anchor biosynthesis, class K
3134034	1.20	1.16	PRKDC	protein kinase, DNA-activated, catalytic polypeptide
2889698	1.20	1.27	CLK4	CDC-like kinase 4
2437417	1.20	1.22	ASH1L	ash1 (absent, small, or homeotic)-like (Drosophila)
3480129	1.20	1.16	ZMYM2	zinc finger, MYM-type 2
2963707	1.20	1.24	RARS2	arginyl-tRNA synthetase 2, mitochondrial
2584018	1.20	1.34	DPP4	dipeptidyl-peptidase 4
2855058	1.20	1.25	OXCT1	3-oxoacid CoA transferase 1
2426791	1.20	1.17	CLCC1	chloride channel CLIC-like 1
2460368	1.20	1.17	TTC13	tetratricopeptide repeat domain 13
2916390	1.20	1.24	ORC3	origin recognition complex, subunit 3
2351632	1.20	1.18	CEPT1	choline/ethanolamine phosphotransferase 1
2519981	1.20	1.20	PMS1	PMS1 postmeiotic segregation increased 1 (S. cerevisiae)
2320762	1.20	1.19	VPS13D	vacuolar protein sorting 13 homolog D (S. cerevisiae)
3420497	1.20	1.18	HELB	helicase (DNA) B
2678714	1.20	1.21	FHIT	fragile histidine triad gene
3148582	1.20	1.31	EIF3E	eukaryotic translation initiation factor 3, subunit E
2897635	1.20	1.25	CDKAL1	CDK5 regulatory subunit associated protein 1-like 1
3023803	1.20	1.23	KLHDC10	kelch domain containing 10
2828564	1.20	1.25	RAD50	RAD50 homolog (S. cerevisiae)
2384956	1.20	1.17	COG2	component of oligomeric golgi complex 2
2620685	1.20	1.22	SACM1L	SAC1 suppressor of actin mutations 1-like (yeast)
2448232	1.20	1.30	TPR	translocated promoter region (to activated MET oncogene)
2769512	1.20	1.16	RPL21P44	ribosomal protein L21 pseudogene 44

2687255	1.20	1.20	CBLB	Cas-Br-M (murine) ecotropic retroviral transforming sequence b
3364095	1.20	1.19	CYP2R1	cytochrome P450, family 2, subfamily R, polypeptide 1
2347502	1.20	1.19	ABCD3	ATP-binding cassette, sub-family D (ALD), member 3
2697490	1.20	1.20	CEP70	centrosomal protein 70kDa
2600689	1.20	1.21	EPHA4	EPH receptor A4
2686371	1.20	1.22	TOMM70A	translocase of outer mitochondrial membrane 70 homolog A (<i>S. cerevisiae</i>)
2486927	1.20	1.20	ARHGAP25	Rho GTPase activating protein 25
3225292	1.20	1.18	SCAI	suppressor of cancer cell invasion
2949118	1.20	1.33	LTB	lymphotoxin beta (TNF superfamily, member 3)
3825911	1.20	1.17	ZNF101	zinc finger protein 101
2813524	1.20	1.25	RAD17	RAD17 homolog (<i>S. pombe</i>)
2404377	1.19	1.17	SNRNP40	small nuclear ribonucleoprotein 40kDa (U5)
2609608	1.19	1.16	SETD5	SET domain containing 5
3779817	1.19	1.18	CEP192	centrosomal protein 192kDa
3214749	1.19	1.17	NOL8	nucleolar protein 8
2722291	1.19	1.16	TBC1D19	TBC1 domain family, member 19
2793054	1.19	1.23	CBR4	carbonyl reductase 4
2900299	1.19	1.16	ZNF192	zinc finger protein 192
2837810	1.19	1.15	UBLCP1	ubiquitin-like domain containing CTD phosphatase 1
2877171	1.19	1.22	FAM13B	family with sequence similarity 13, member B
2851965	1.19	1.19	DROSHA	drosha, ribonuclease type III
2373842	1.19	1.25	PTPRC	protein tyrosine phosphatase, receptor type, C
2964553	1.19	1.27	BACH2	BTB and CNC homology 1, basic leucine zipper transcription factor 2
3142519	1.19	1.16	ZFAND1	zinc finger, AN1-type domain 1
2854327	1.19	1.24	FYB	FYN binding protein
3107661	1.19	1.20	INTS8	integrator complex subunit 8
2524743	1.19	1.16	FASTKD2	FAST kinase domains 2
2593352	1.19	1.23	GTF3C3	general transcription factor IIIC, polypeptide 3, 102kDa
3037142	1.19	1.17	PMS2	PMS2 postmeiotic segregation increased 2 (<i>S. cerevisiae</i>)
2881747	1.19	1.17	ANXA6	annexin A6
2566764	1.19	1.20	REV1	REV1 homolog (<i>S. cerevisiae</i>)
2677653	1.19	1.27	C3orf63	chromosome 3 open reading frame 63

2559649	1.19	1.23	DUSP11	dual specificity phosphatase 11 (RNA/RNP complex 1-interacting)
2913983	1.19	1.31	SEN6	SUMO1/sentrin specific peptidase 6
3199431	1.19	1.20	ZDHHC21	zinc finger, DHHC-type containing 21
2868131	1.19	1.17	ERAP1	endoplasmic reticulum aminopeptidase 1
2481308	1.19	1.19	KLRAQ1	KLRAQ motif containing 1
2405364	1.19	1.16	AK2	adenylate kinase 2
2593670	1.19	1.30	SF3B1	splicing factor 3b, subunit 1, 155kDa
2622469	1.19	1.22	RBM5	RNA binding motif protein 5
3626704	1.19	1.18	SLTM	SAFB-like, transcription modulator
3493448	1.19	1.19	PIBF1	progesterone immunomodulatory binding factor 1
3909354	1.19	1.16	ADNP	activity-dependent neuroprotector homeobox
3439603	1.19	1.17	KDM5A	lysine (K)-specific demethylase 5A
3161566	1.19	1.17	KDM4C	lysine (K)-specific demethylase 4C
2823820	1.19	1.21	WDR36	WD repeat domain 36
3487220	1.19	1.19	AKAP11	A kinase (PRKA) anchor protein 11
2375810	1.19	1.30	ZC3H11A	zinc finger CCCH-type containing 11A
3349453	1.19	1.23	TTC12	tetratricopeptide repeat domain 12
3301011	1.19	1.16	NOC3L	nucleolar complex associated 3 homolog (<i>S. cerevisiae</i>)
2839671	1.19	1.24	RARS	arginyl-tRNA synthetase
2425212	1.19	1.22	DBT	dihydrolipoamide branched chain transacylase E2
3929664	1.19	1.16	TMEM50B	transmembrane protein 50B
2329077	1.19	1.21	S100PBP	S100P binding protein
2724585	1.18	1.32	N4BP2	NEDD4 binding protein 2
2361036	1.18	1.26	DAP3	death associated protein 3
2434776	1.18	1.19	CDC42SE1	CDC42 small effector 1
2725779	1.18	1.18	GUF1	GUF1 GTPase homolog (<i>S. cerevisiae</i>)
2436228	1.18	1.20	GATAD2B	GATA zinc finger domain containing 2B
2350287	1.18	1.25	PRPF38B	PRP38 pre-mRNA processing factor 38 (yeast) domain containing B
2374872	1.18	1.16	IPO9	importin 9
2618640	1.18	1.20	RPL14	ribosomal protein L14
2369843	1.18	1.24	CEP350	centrosomal protein 350kDa
3011250	1.18	1.23	DMTF1	cyclin D binding myb-like transcription factor 1
2597409	1.18	1.22	LANCL1	LanC lantibiotic synthetase component C- like 1 (bacterial)

3784727	1.18	1.17	ELP2	elongation protein 2 homolog (S. cerevisiae)
2670481	1.18	1.17	ULK4	unc-51-like kinase 4 (C. elegans)
2541230	1.18	1.21	NBAS	neuroblastoma amplified sequence
2924898	1.18	1.22	RNF146	ring finger protein 146
2766588	1.18	1.23	PDS5A	PDS5, regulator of cohesion maintenance, homolog A (S. cerevisiae)
3535922	1.18	1.16	STYX	serine/threonine/tyrosine interacting protein
2783473	1.18	1.28	C4orf3	chromosome 4 open reading frame 3
2866543	1.18	1.16	CETN3	centrin, EF-hand protein, 3
3252382	1.18	1.18	KAT6B	K(lysine) acetyltransferase 6B
2954005	1.18	1.19	MRPS10	mitochondrial ribosomal protein S10
2686646	1.18	1.38	SEN7	SUMO1/sentrin specific peptidase 7
3089401	1.18	1.21	PPP3CC	protein phosphatase 3, catalytic subunit, gamma isozyme
3387033	1.18	1.17	MRE11A	MRE11 meiotic recombination 11 homolog A (S. cerevisiae)
2412834	1.18	1.27	ZCCHC11	zinc finger, CCHC domain containing 11
2388525	1.18	1.22	SDCCAG8	serologically defined colon cancer antigen 8
2712858	1.18	1.18	UBXN7	UBX domain protein 7
2769182	1.18	1.20	SCFD2	sec1 family domain containing 2
2649640	1.18	1.17	GFM1	G elongation factor, mitochondrial 1
3623771	1.18	1.19	TRPM7	transient receptor potential cation channel, subfamily M, member 7
3135567	1.18	1.17	LYPLA1	lysophospholipase I
2612278	1.18	1.23	CAPN7	calpain 7
2563481	1.18	1.16	KRCC1	lysine-rich coiled-coil 1
3898224	1.18	1.17	ESF1	ESF1, nucleolar pre-rRNA processing protein, homolog (S. cerevisiae)
2523144	1.18	1.32	NOP58	NOP58 ribonucleoprotein homolog (yeast)
3107606	1.18	1.16	DPY19L4	dpy-19-like 4 (C. elegans)
2867145	1.18	1.18	FAM172A	family with sequence similarity 172, member A
3534886	1.18	1.20	KLHDC1	kelch domain containing 1
2594535	1.18	1.19	PPIL3	peptidylprolyl isomerase (cyclophilin)-like 3
3177563	1.18	1.18	NAA35	N(alpha)-acetyltransferase 35, NatC auxiliary subunit
2421782	1.18	1.27	CCBL2	cysteine conjugate-beta lyase 2
2753994	1.18	1.20	C4orf41	chromosome 4 open reading frame 41

2495881	1.18	1.23	EIF5B	eukaryotic translation initiation factor 5B
2588066	1.18	1.21	ATF2	activating transcription factor 2
2484305	1.18	1.23	PAPOLG	poly(A) polymerase gamma
3004665	1.18	1.19	ZNF138	zinc finger protein 138
2812435	1.18	1.25	ERBB2IP	erbb2 interacting protein
2741083	1.18	1.19	METTL14	methyltransferase like 14
2694123	1.18	1.15	RUVBL1	RuvB-like 1 (E. coli)
3320604	1.18	1.17	USP47	ubiquitin specific peptidase 47
2663038	1.18	1.19	C3orf31	chromosome 3 open reading frame 31
2422517	1.18	1.24	ZNF644	zinc finger protein 644
3724591	1.18	1.25	C17orf57	chromosome 17 open reading frame 57
2499158	1.18	1.31	RANBP2	RAN binding protein 2
2673873	1.18	1.17	IMPDH2	IMP (inosine 5'-monophosphate) dehydrogenase 2
2353881	1.18	1.23	MAN1A2	mannosidase, alpha, class 1A, member 2
2413519	1.18	1.16	HSPB11	heat shock protein family B (small), member 11
3024275	1.18	1.22	MKLN1	muskelin 1, intracellular mediator containing kelch motifs
2416522	1.18	1.28	JAK1	Janus kinase 1
2635983	1.18	1.15	ABHD10	abhydrolase domain containing 10
2731757	1.18	1.19	THAP6	THAP domain containing 6
3609138	1.18	1.20	CHD2	chromodomain helicase DNA binding protein 2
2531310	1.18	1.19	SP140L	SP140 nuclear body protein-like
2338625	1.17	1.15	HOOK1	hook homolog 1 (Drosophila)
3145020	1.17	1.17	KIAA1429	KIAA1429
2892738	1.17	1.23	PRPF4B	PRP4 pre-mRNA processing factor 4 homolog B (yeast)
2695393	1.17	1.23	MRPL3	mitochondrial ribosomal protein L3
3499453	1.17	1.17	TPP2	tripeptidyl peptidase II
2458773	1.17	1.21	PARP1	poly (ADP-ribose) polymerase 1
3448975	1.17	1.18	ERGIC2	ERGIC and golgi 2
2492064	1.17	1.26	KDM3A	lysine (K)-specific demethylase 3A
2435195	1.17	1.16	MRPL9	mitochondrial ribosomal protein L9
2407439	1.17	1.19	SF3A3	splicing factor 3a, subunit 3, 60kDa
3781980	1.17	1.22	TTC39C	tetratricopeptide repeat domain 39C
2937856	1.17	1.17	FAM120B	family with sequence similarity 120B
2348702	1.17	1.18	SLC35A3	solute carrier family 35 (UDP-N-acetylglucosamine (UDP-GlcNAc) transporter), member A3
2586845	1.17	1.18	SLC25A12	solute carrier family 25 (mitochondrial carrier, Aralar), member 12

3387537	1.17	1.23	MAML2	mastermind-like 2 (Drosophila)
2488078	1.17	1.23	MPHOSPH10	M-phase phosphoprotein 10 (U3 small nucleolar ribonucleoprotein)
3508696	1.17	1.15	N4BP2L2	NEDD4 binding protein 2-like 2
3428088	1.17	1.20	ACTR6	ARP6 actin-related protein 6 homolog (yeast)
3347831	1.17	1.17	DDX10	DEAD (Asp-Glu-Ala-Asp) box polypeptide 10
3486383	1.17	1.17	COG6	component of oligomeric golgi complex 6
3419239	1.17	1.15	MON2	MON2 homolog (<i>S. cerevisiae</i>)
3695268	1.17	1.15	NAE1	NEDD8 activating enzyme E1 subunit 1
3732448	1.17	1.17	BPTF	bromodomain PHD finger transcription factor
2526980	1.17	1.22	XRCC5	X-ray repair complementing defective repair in Chinese hamster cells 5 (double-strand-break rejoining)
3504434	1.17	1.18	XPO4	exportin 4
2688882	1.17	1.23	C3orf17	chromosome 3 open reading frame 17
2537109	1.17	1.19	SH3YL1	SH3 domain containing, Ysc84-like 1 (<i>S. cerevisiae</i>)
2713192	1.17	1.25	DLG1	discs, large homolog 1 (Drosophila)
3681377	1.17	1.16	PARN	poly(A)-specific ribonuclease (deadenylation nuclease)
3060245	1.17	1.18	SLC25A40	solute carrier family 25, member 40
3076489	1.17	1.15	MRPS33	mitochondrial ribosomal protein S33
2417174	1.17	1.34	SERBP1	SERPINE1 mRNA binding protein 1
2685034	1.17	1.16	CGGBP1	CGG triplet repeat binding protein 1
3053380	1.17	1.21	ZNF117	zinc finger protein 117
2500722	1.17	1.20	ZC3H6	zinc finger CCCH-type containing 6
3111375	1.17	1.25	TTC35	tetratricopeptide repeat domain 35
2367154	1.17	1.25	PRRC2C	proline-rich coiled-coil 2C
2688955	1.17	1.21	CD200R1	CD200 receptor 1
2727913	1.17	1.22	EXOC1	exocyst complex component 1
2385197	1.17	1.22	GNPAT	glyceronephosphate O-acyltransferase
2707359	1.17	1.15	DNAJC19	DnaJ (Hsp40) homolog, subfamily C, member 19
3795680	1.17	1.18	THOC1	THO complex 1
2446447	1.17	1.16	ACBD6	acyl-CoA binding domain containing 6
3265047	1.17	1.18	NHLRC2	NHL repeat containing 2
2707824	1.17	1.19	MCCC1	methycrotonoyl-CoA carboxylase 1 (alpha)
2456849	1.17	1.22	RAB3GAP2	RAB3 GTPase activating protein subunit 2 (non-catalytic)

3821377	1.17	1.18	ZNF441	zinc finger protein 441
2700197	1.17	1.17	HLTF	helicase-like transcription factor
3406015	1.17	1.20	ATF7IP	activating transcription factor 7 interacting protein
2867836	1.17	1.25	GLRX	glutaredoxin (thioltransferase)
2810458	1.17	1.28	GPBP1	GC-rich promoter binding protein 1
3139035	1.17	1.16	ARFGEF1	ADP-ribosylation factor guanine nucleotide-exchange factor 1(brefeldin A-inhibited)
3241316	1.17	1.18	ZEB1	zinc finger E-box binding homeobox 1
2824286	1.17	1.26	SRP19	signal recognition particle 19kDa
3812426	1.17	1.15	RTTN	rotatin
2897842	1.17	1.19	CDKAL1	CDK5 regulatory subunit associated protein 1-like 1
3942648	1.17	1.19	TUG1	taurine upregulated 1 (non-protein coding)
2515183	1.16	1.20	DCAF17	DDB1 and CUL4 associated factor 17
3786039	1.16	1.18	PIK3C3	phosphoinositide-3-kinase, class 3
3061191	1.16	1.20	PEX1	peroxisomal biogenesis factor 1
3518496	1.16	1.19	MYCBP2	MYC binding protein 2
2741901	1.16	1.19	KIAA1109	KIAA1109
3081613	1.16	1.16	LMBR1	limb region 1 homolog (mouse)
2676319	1.16	1.19	GLT8D1	glycosyltransferase 8 domain containing 1
3465593	1.16	1.17	EEA1	early endosome antigen 1
2413943	1.16	1.21	USP24	ubiquitin specific peptidase 24
3017123	1.16	1.19	PMPCB	peptidase (mitochondrial processing) beta
2925510	1.16	1.23	L3MBTL3	l(3)mbt-like 3 (Drosophila)
2966636	1.16	1.21	ASCC3	activating signal cointegrator 1 complex subunit 3
2812120	1.16	1.16	CWC27	CWC27 spliceosome-associated protein homolog (S. cerevisiae)
2734018	1.16	1.22	MRPS18C	mitochondrial ribosomal protein S18C
2462511	1.16	1.20	HEATR1	HEAT repeat containing 1
2616131	1.16	1.16	CCR4	chemokine (C-C motif) receptor 4
2380785	1.16	1.34	LYPLAL1	lysophospholipase-like 1
2687840	1.16	1.22	IFT57	intraflagellar transport 57 homolog (Chlamydomonas)
3788302	1.16	1.17	SMAD4	SMAD family member 4
3862018	1.16	1.16	RPS16	ribosomal protein S16
2542816	1.16	1.27	PUM2	pumilio homolog 2 (Drosophila)
2454532	1.16	1.16	INTS7	integrator complex subunit 7
2776026	1.16	1.19	HELQ	helicase, POLQ-like

2342391	1.16	1.15	TYW3	tRNA-yW synthesizing protein 3 homolog (S. cerevisiae)
3840142	1.16	1.16	ZNF480	zinc finger protein 480
2953435	1.16	1.21	C6orf130	chromosome 6 open reading frame 130
2408855	1.16	1.20	FOXJ3	forkhead box J3
2908100	1.16	1.15	POLH	polymerase (DNA directed), eta
2599433	1.16	1.16	USP37	ubiquitin specific peptidase 37
2978876	1.16	1.23	PPIL4	peptidylprolyl isomerase (cyclophilin)-like 4
2808748	1.16	1.19	PARP8	poly (ADP-ribose) polymerase family, member 8
3489418	1.16	1.18	SETDB2	SET domain, bifurcated 2
3070908	1.16	1.22	POT1	protection of telomeres 1 homolog (S. pombe)
2452637	1.16	1.19	NUCKS1	nuclear casein kinase and cyclin-dependent kinase substrate 1
3219547	1.16	1.17	IKBKAP	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase complex-associated protein
2811745	1.16	1.18	IPO11	importin 11
2470654	1.16	1.19	DDX1	DEAD (Asp-Glu-Ala-Asp) box polypeptide 1
3821323	1.16	1.15	ZNF700	zinc finger protein 700
2900423	1.16	1.15	ZNF187	zinc finger protein 187
2565262	1.16	1.17	SNRNP200	small nuclear ribonucleoprotein 200kDa (U5)
2938196	1.16	1.17	EXOC2	exocyst complex component 2
3133135	1.16	1.18	KAT6A	K(lysine) acetyltransferase 6A
2636185	1.16	1.17	SLC35A5	solute carrier family 35, member A5
3449304	1.16	1.15	IPO8	importin 8
3409432	1.16	1.20	CCDC91	coiled-coil domain containing 91
2768145	1.16	1.17	COMMD8	COMM domain containing 8
2929168	1.16	1.17	UTRN	utrophin
2358221	1.16	1.20	RPRD2	regulation of nuclear pre-mRNA domain containing 2
2855578	1.16	1.17	C5orf28	chromosome 5 open reading frame 28
3815649	1.16	1.18	CIRBP	cold inducible RNA binding protein
3067080	1.16	1.18	COG5	component of oligomeric golgi complex 5
3661152	1.16	1.15	FTO	fat mass and obesity associated
2820622	1.16	1.16	ANKRD32	ankyrin repeat domain 32
3451670	1.16	1.19	PUS7L	pseudouridylate synthase 7 homolog (S. cerevisiae)-like
3066297	1.16	1.22	SRPK2	SRSF protein kinase 2
2603897	1.16	1.19	TIGD1	tigger transposable element derived 1

2869275	1.16	1.18	GIN1	gypsy retrotransposon integrase 1
3386814	1.16	1.22	TAF1D	TATA box binding protein (TBP)-associated factor, RNA polymerase I, D, 41kDa
2701595	1.16	1.24	DHX36	DEAH (Asp-Glu-Ala-His) box polypeptide 36
3072435	1.16	1.19	TMEM209	transmembrane protein 209
3412008	1.16	1.16	PPHLN1	periphrin 1
2857301	1.16	1.16	SLC38A9	solute carrier family 38, member 9
2447824	1.16	1.17	EDEM3	ER degradation enhancer, mannosidase alpha-like 3
3245682	1.16	1.18	MAPK8	mitogen-activated protein kinase 8
3278813	1.16	1.16	FAM107B	family with sequence similarity 107, member B
3012819	1.16	1.15	CCDC132	coiled-coil domain containing 132
2911413	1.16	1.18	PRIM2	primase, DNA, polypeptide 2 (58kDa)
2454935	1.16	1.18	ANGEL2	angel homolog 2 (Drosophila)
3716337	1.16	1.15	NSRP1	nuclear speckle splicing regulatory protein 1
3857208	1.16	1.16	ZNF681	zinc finger protein 681
2512330	1.16	1.35	7-Mar	membrane-associated ring finger (C3HC4) 7
2459866	1.16	1.16	NUP133	nucleoporin 133kDa
2808290	1.16	1.20	ZNF131	zinc finger protein 131
2448971	1.16	1.18	UCHL5	ubiquitin carboxyl-terminal hydrolase L5
3164221	1.16	1.16	DENND4C	DENN/MADD domain containing 4C
2692573	1.16	1.23	CCDC14	coiled-coil domain containing 14
2413423	1.16	1.17	TMEM48	transmembrane protein 48
2971378	1.16	1.15	GOPC	golgi-associated PDZ and coiled-coil motif containing
2534456	1.15	1.23	LRRFIP1	leucine rich repeat (in FLII) interacting protein 1
2476116	1.15	1.15	SLC30A6	solute carrier family 30 (zinc transporter), member 6
2523635	1.15	1.16	CYP20A1	cytochrome P450, family 20, subfamily A, polypeptide 1
2853768	1.15	1.18	NUP155	nucleoporin 155kDa
2762468	1.15	1.24	DCAF16	DDB1 and CUL4 associated factor 16
2754371	1.15	1.20	CCDC111	coiled-coil domain containing 111
3387771	1.15	1.17	CCDC82	coiled-coil domain containing 82
2461786	1.15	1.24	ARID4B	AT rich interactive domain 4B (RBP1-like)
2477372	1.15	1.16	C2orf56	chromosome 2 open reading frame 56
3462094	1.15	1.20	ZFC3H1	zinc finger, C3H1-type containing

2882555	1.15	1.17	FAM114A2	family with sequence similarity 114, member A2
2964771	1.15	1.16	MAP3K7	mitogen-activated protein kinase kinase kinase 7
2962525	1.15	1.25	IBTK	inhibitor of Bruton agammaglobulinemia tyrosine kinase
3512769	1.15	1.15	ZC3H13	zinc finger CCCH-type containing 13
2525272	1.15	1.21	PIKFYVE	phosphoinositide kinase, FYVE finger containing
2756497	1.15	1.16	ATP5I	ATP synthase, H ⁺ transporting, mitochondrial Fo complex, subunit E
2655113	1.15	1.17	KLHL24	kelch-like 24 (Drosophila)
2819044	1.15	1.25	RASA1	RAS p21 protein activator (GTPase activating protein) 1
2346934	1.15	1.22	MTF2	metal response element binding transcription factor 2
2696802	1.15	1.21	STAG1	stromal antigen 1
2773023	1.15	1.16	ANKRD17	ankyrin repeat domain 17
3036985	1.15	1.16	RNF216	ring finger protein 216
2428760	1.15	1.17	RSBN1	round spermatid basic protein 1
3085270	1.15	1.19	TNKS	tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymerase
2859775	1.15	1.15	SGTB	small glutamine-rich tetratricopeptide repeat (TPR)-containing, beta
2873168	1.15	1.25	CEP120	centrosomal protein 120kDa
2821347	1.15	1.32	ERAP2	endoplasmic reticulum aminopeptidase 2
3074362	1.15	1.17	CNOT4	CCR4-NOT transcription complex, subunit 4
2615360	1.15	1.22	TGFBR2	transforming growth factor, beta receptor II (70/80kDa)
3372459	1.15	1.15	FNBP4	formin binding protein 4
3106310	1.15	1.20	DECR1	2,4-dienoyl CoA reductase 1, mitochondrial
2345880	1.15	1.29	LRRC8B	leucine rich repeat containing 8 family, member B
3114878	1.15	1.17	NSMCE2	non-SMC element 2, MMS21 homolog (S. cerevisiae)
2997097	1.15	1.20	SEPT7	septin 7
3778252	1.15	1.23	ANKRD12	ankyrin repeat domain 12

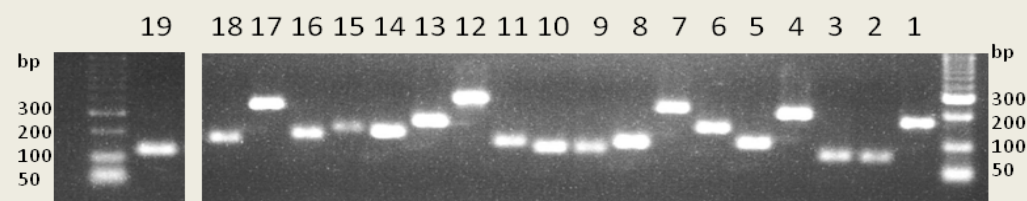
Supplemental Table 8. Hypoxia suppressed genes in *HbSS* and *VHL*^{R200W}.

Chr	Gene	Gene Start	Gene Stop	SNP ID	SNP Position	β	Nominal P	Allele	Allele Frequency
19	ZNF266	9523271	9546234	rs7257650	9504101	0.24	1.3E-16	A/G	0.44/0.56
5	ERAP2	96211644	96255407	rs2548533	96238401	-0.52	2.1E-15	T/C	0.43/0.57
17	JUP	39910859	39942964	rs1865840	39947009	-0.43	3.3E-14	G/A	0.26/0.74
11	TTC12	113185251	113237114	rs6589371	113192797	-0.16	2.3E-11	T/C	0.41/0.59
6	EXOC2	485138	693109	rs2317079	689565	-0.083	1.4E-10	C/T	0.36/0.64
5	CENPK	64813593	64858995	rs42468	64908111	-0.35	1.6E-10	T/G	0.51/0.49
20	SIRPB1	1545029	1600689	rs2209313	1599142	-0.46	2.2E-10	A/G	0.11/0.89
4	ATP8A1	42410390	42659122	rs2575460	42682196	-0.14	4.7E-09	A/T	0.25/0.75
16	BBS2	56518259	56554008	rs9921942	56418336	0.14	5.1E-09	G/C	0.15/0.85
2	LCLAT1	30670123	30867091	rs829573	30682630	-0.16	8.3E-09	T/A	0.19/0.81
5	FAM114A2	153371263	153418497	rs3776985	153416366	0.067	2.0E-08	G/A	0.43/0.57
16	RBL2	53468351	53525560	rs16952252	53483980	-0.11	2.4E-08	G/T	0.44/0.56
7	COG5	106842189	107204959	rs17154040	107005246	-0.11	3.9E-08	C/T	0.15/0.85
17	GSDMB	38060848	38074903	rs9303277	37976469	-0.12	6.1E-08	C/T	0.39/0.61
2	ALMS1	73612886	73837046	rs6546826	73599808	0.083	2.1E-07	G/A	0.29/0.71
6	NUP43	150045457	150067688	rs12526675	150050676	0.1	3.4E-07	A/C	0.25/0.75
2	REV1	100016938	100106480	rs2141908	99929028	-0.045	3.9E-07	A/T	0.29/0.71
2	TTC21B	166730453	166810348	rs13397332	166745732	-0.095	4.4E-07	G/T	0.12/0.88
2	GCC2	109065577	109125854	rs2577599	109108460	0.13	4.9E-07	A/G	0.2/0.8
11	MRE11A	94150466	94227040	rs518276	94167257	-0.073	6.2E-07	T/C	0.45/0.55
3	SLC35A5	112280895	112303003	rs2638022	112265776	-0.074	1.2E-06	T/C	0.42/0.58
6	ASCC3	100956608	101329224	rs9390671	101203051	0.06	1.2E-06	C/A	0.21/0.79
4	RHOH	40198527	40246281	rs4078470	40305745	0.11	1.3E-06	T/A	0.39/0.61
7	ZNF117	64434830	64451414	rs1608716	64443401	0.25	2.0E-06	T/C	0.25/0.75
19	ZNF83	53115617	53193886	rs329941	53156944	-0.19	2.1E-06	T/C	0.31/0.69
2	PPIL3	201735679	201753849	rs10205561	201809704	0.1	2.3E-06	A/G	0.52/0.48
11	MRE11A	94150466	94227040	rs535801	94212048	-0.08	2.3E-06	T/C	0.29/0.71
9	C9orf95	77676116	77703133	rs10869495	77699899	0.091	3.1E-06	G/A	0.33/0.67
4	HELQ	84328499	84377025	rs7658363	84356454	0.056	3.9E-06	G/A	0.34/0.66
1	AKT3	243651535	244006886	rs2994333	243671159	-0.11	4.2E-06	A/G	0.19/0.81
9	ZDHHC21	14611069	14693480	rs12001764	14713691	0.11	5.9E-06	G/A	0.22/0.78
5	ERAP1	96096514	96149848	rs26485	96016477	0.07	7.7E-06	C/T	0.48/0.52
1	CRYZ	75171170	75199092	rs1969111	75263485	-0.13	8.7E-06	T/A	0.3/0.7
6	NT5E	86159302	86205509	rs7753022	86176625	0.17	9.2E-06	T/C	0.32/0.68
16	ZFP90	68573661	68601039	rs1069288	68585285	0.13	1.0E-05	C/G	0.29/0.71
6	GOPC	117881432	117923705	rs13205986	117791674	0.08	1.1E-05	A/G	0.32/0.68
2	SH3YL1	218136	264068	rs17713396	227201	0.091	1.2E-05	T/C	0.21/0.79
5	ERAP2	96211644	96255407	rs34755	96151760	-0.32	1.3E-05	A/C	0.46/0.54
3	SLC35A5	112280895	112303003	rs16859775	112271140	0.13	1.8E-05	T/C	0.11/0.89
10	NMT2	15147771	15210695	rs10906857	15239498	0.096	1.9E-05	G/A	0.42/0.58
1	LGALS8	236681514	236716281	rs1041939	236711618	0.083	2.0E-05	C/A	0.25/0.75
5	PARP8	49961733	50142356	rs10512906	50062611	-0.11	2.2E-05	T/C	0.22/0.78
10	MAPK8	49609687	49643183	rs10857560	49594240	-0.077	2.2E-05	C/A	0.32/0.68
7	NAA38	117824086	117844093	rs41934	117944039	-0.085	2.3E-05	A/C	0.27/0.73

18	ELP2	33709837	33754688	rs1789547	33725705	-0.068	2.5E-05	T/C	0.25/0.75
19	ZNF266	9523271	9546234	rs4804446	9568277	0.15	2.8E-05	G/A	0.33/0.67
17	SPECC1	19990335	20218068	rs7219688	19952451	0.13	2.9E-05	A/G	0.15/0.85
6	ZNF192	28109716	28125236	rs993619	28189663	0.059	3.3E-05	C/G	0.36/0.64
3	GFM1	158362317	158410361	rs6772483	158415999	-0.039	3.4E-05	A/G	0.31/0.69
6	L3MBTL3	130339728	130462594	rs6902109	130316559	-0.1	3.5E-05	A/G	0.2/0.8
11	TTC12	113185251	113237114	rs6589369	113190875	0.18	3.6E-05	T/C	0.14/0.86
10	NSUN6	18834264	18940550	rs12772534	18866868	0.058	4.0E-05	C/T	0.45/0.55
6	RNF182	13924677	13980240	rs9475771	13914869	-0.33	4.9E-05	A/G	0.31/0.69
4	HELQ	84328499	84377025	rs7681313	84317759	-0.047	5.1E-05	A/C	0.3/0.7
4	CCDC111	185570767	185616112	rs2720376	185554300	-0.07	5.2E-05	C/T	0.35/0.65
2	RPL31	101618691	101636155	rs1374324	101614322	0.18	5.7E-05	T/C	0.48/0.52
2	STK39	168810530	169104105	rs6714707	169010297	-0.054	6.1E-05	G/A	0.33/0.67
3	RBM6	49977477	50114685	rs9861216	50059339	0.069	6.1E-05	A/G	0.55/0.45
10	NSUN6	18834264	18940550	rs4628581	18799890	0.052	6.3E-05	A/C	0.37/0.63
17	PCTP	53828340	53854748	rs2960067	53846348	0.18	6.5E-05	C/T	0.11/0.89
6	CDKAL1	20534688	21232635	rs807827	21272431	-0.039	6.8E-05	G/A	0.38/0.62
5	RAD17	68665124	68710628	rs6450035	68656135	-0.047	7.1E-05	G/T	0.46/0.54
1	MYSM1	59120411	59165747	rs232794	59133024	-0.069	8.0E-05	C/A	0.34/0.66
2	SPTBN1	54683454	54898583	rs10184128	54803816	-0.087	8.0E-05	A/G	0.39/0.61
3	KLHL24	183353411	183402307	rs6443901	183350349	-0.08	8.1E-05	T/C	0.25/0.75
5	CENPK	64813593	64858995	rs149514	64851737	-0.24	8.8E-05	C/A	0.51/0.49
3	RBM6	49977477	50114685	rs1138536	50153356	0.073	8.9E-05	T/C	0.3/0.7
7	JAZF1	27870192	28220437	rs849338	28285580	-0.12	9.5E-05	G/T	0.2/0.8
6	TRMT11	126307576	126360422	rs6900105	126310726	0.063	9.8E-05	G/A	0.18/0.82
4	GYPA	145030456	145061904	rs6832605	145144408	-0.18	0.00012	T/C	0.25/0.75
2	DOCK10	225629807	225907330	rs1947223	225946057	-0.074	0.00012	C/A	0.35/0.65
6	MTO1	74171454	74211179	rs535902	74191545	0.081	0.00012	C/T	0.11/0.89
13	MTIF3	28009776	28024739	rs1218794	28000700	0.053	0.00013	A/T	0.48/0.52
18	ELP2	33709837	33754688	rs559289	33752890	-0.058	0.00014	C/A	0.47/0.53
19	ZNF626	20802745	20844402	rs959420	20826678	-0.16	0.00014	T/A	0.46/0.54
3	FOXP1	71004736	71633140	rs830599	71626262	-0.072	0.00015	C/G	0.15/0.85
7	BBS9	33169152	33645680	rs4723272	33220866	-0.033	0.00015	A/G	0.3/0.7
12	TAS2R20	11148561	11150474	rs10772399	11139656	-0.12	0.00015	C/T	0.15/0.85
15	RASGRP1	38780302	38857007	rs16967120	38920447	-0.069	0.00016	T/C	0.25/0.75
17	GSDMB	38060848	38074903	rs869402	38068043	0.12	0.00016	T/C	0.17/0.83
1	MYSM1	59120411	59165747	rs2984915	59253695	0.069	0.00017	G/A	0.34/0.66
11	CD3G	118215059	118224497	rs2276418	118230264	0.25	0.00019	A/T	0.11/0.89
6	HIST1H4H	26285354	26285727	rs9461246	26381660	0.27	0.00020	A/G	0.53/0.47
3	SLC15A2	121613171	121663034	rs1920321	121557251	-0.086	0.00020	T/A	0.23/0.77
1	ABCD3	94883933	94984219	rs10399820	94876282	-0.058	0.00021	G/C	0.25/0.75
2	LCLAT1	30670123	30867091	rs17009802	30795519	0.1	0.00021	G/A	0.2/0.8
2	PPIL3	201735679	201753849	rs4035021	201739327	-0.13	0.00021	A/G	0.14/0.86
7	ORC5	103766788	103848495	rs4265124	103870154	0.038	0.00021	G/T	0.39/0.61
19	FPR1	52249023	52255150	rs7253284	52250761	0.13	0.00022	A/G	0.33/0.67
7	ESYT2	158523689	158622319	rs12670643	158584553	-0.052	0.00022	C/G	0.4/0.6
17	GABARAP	7143738	7145753	rs8076120	7216763	0.16	0.00023	A/G	0.15/0.85

3	C3orf31	11831919	11888352	rs440746	11888556	-0.058	0.00023	G/T	0.49/0.51
6	FARS2	5261584	5771816	rs2753235	5252182	-0.057	0.00023	T/C	0.42/0.58
3	NPHP3	132399453	132441303	rs2369832	132437390	0.051	0.00024	T/C	0.18/0.82
7	STK17A	43622692	43666978	rs7781049	43704519	0.082	0.00024	C/A	0.19/0.81
8	INTS8	95835534	95892721	rs9297945	95749023	-0.059	0.00024	C/T	0.19/0.81
1	CD84	160510884	160549306	rs7539149	160556188	-0.094	0.00025	C/T	0.43/0.57
3	ULK4	41288090	42003660	rs13087502	42015110	0.074	0.00025	A/G	0.39/0.61
9	ZDHHHC21	14611069	14693480	rs12002092	14543729	0.12	0.00026	T/A	0.11/0.89
20	SIRPB1	1545029	1600689	rs6079527	1520042	-0.2	0.00028	A/T	0.25/0.75
2	LCLAT1	30670123	30867091	rs4952004	30861454	-0.12	0.00028	C/G	0.14/0.86
15	PLEKHO2	65134082	65160201	rs1879927	65237359	-0.068	0.00029	G/T	0.54/0.46
17	C17orf57	45401327	45518678	rs9895509	45549618	-0.093	0.00029	T/A	0.21/0.79
5	ERAP2	96211644	96255407	rs2549779	96216387	0.32	0.00030	C/T	0.45/0.55
10	ZNF33B	43084555	43133992	rs1852961	43006451	0.075	0.00030	C/A	0.47/0.53
12	CLEC4E	8685901	8693558	rs10841875	8698954	0.15	0.00031	G/A	0.48/0.52
2	DOCK10	225629807	225907330	rs6750856	225749157	0.071	0.00032	G/A	0.47/0.53
21	TTC3	38445571	38575408	rs2835570	38439504	0.061	0.00032	G/A	0.19/0.81
1	ZNHIT6	86115106	86174116	rs9324152	86155359	0.045	0.00034	A/T	0.25/0.75
8	PCM1	17780366	17887457	rs7010893	17757426	0.087	0.00034	C/G	0.12/0.88
18	TTC39C	21572737	21715574	rs41400947	21623416	0.093	0.00034	C/T	0.3/0.7
19	ZNF701	53073526	53090427	rs1457858	52976680	0.12	0.00034	T/C	0.23/0.77
2	TTC21B	166730453	166810348	rs1023707	166719996	-0.054	0.00036	G/C	0.25/0.75
13	ZC3H13	46536314	46626894	rs17350833	46537757	0.061	0.00036	T/C	0.16/0.84
6	TREM1	41242999	41254457	rs2068392	41320465	-0.24	0.00037	G/A	0.15/0.85
2	EPHA4	222282747	222437010	rs2710498	222402051	0.11	0.00037	A/T	0.25/0.75
1	LRRC8B	89990397	90063420	rs12119009	90023756	-0.13	0.00038	G/C	0.19/0.81
19	ZNF83	53115617	53193886	rs7257138	53119029	-0.14	0.00042	G/A	0.44/0.56
17	IKZF3	37921198	38020441	rs9303277	37976469	0.086	0.00043	C/T	0.39/0.61
10	MARCH8	45952817	46090354	rs963029	45963387	-0.11	0.00044	A/G	0.25/0.75
2	GCC2	109065577	109125854	rs10196756	109025768	0.11	0.00046	C/T	0.16/0.84
1	JAK1	65298906	65432187	rs2483616	65250982	-0.07	0.00047	A/C	0.2/0.8
1	EDEM3	184659625	184724041	rs10911619	184573082	0.055	0.00048	T/C	0.31/0.69
2	GLS	191745547	191829776	rs16833157	191862398	0.075	0.00048	A/G	0.17/0.83
1	GNG5	84964006	84972262	rs7514763	84930166	0.04	0.00050	G/T	0.16/0.84
10	ZNF33B	43084555	43133992	rs472610	43211415	0.071	0.00050	G/A	0.31/0.69

Supplemental Table 9. QTL detected at 5% FDR for hypoxic response genes in SCD patients in the pooled Howard University and University of Chicago cohorts. Genes CLEC4E, FPR1, GABARAP, GNG5, GYPA, HIST1H4H, JAZF1, JUP, MARCH8, PCTP, PLEKHO2, RNF182, SIRPB1, SPECC1 and TREM1 were hypoxia induced. The remaining genes were hypoxia suppressed. Genes were ordered alphabetically. For each gene, eQTL with $r^2 > 0.3$ were pruned. Chromosomal positions were based on Genome Reference Consortium Human Build 37.



1: *PLAUR*; 2: *CCR7*; 3: *PDK1*; 4: *IL7R*; 5: *ADIPOR1*; 6: *HK1*; 7: *BNIP3L*; 8: *ETS1*; 9: *IL1B*; 10: *BPGM*; 11: *FECH*; 12: *HMOX1*; 13: *SLC2537*; 14: *SOD2*; 15: *MAPK8*; 16: *SELENBP1*; 17: *CA1*; 18: *S1PR1*; 19: *GUSB*. DNA ladder: HyperLadder II (Gentoprice, Brussels, Belgium).

Note: primers for *IL1B* and *BPGM* had poor amplification efficiency based on the slope of the standard curve thereby not included in further reports.

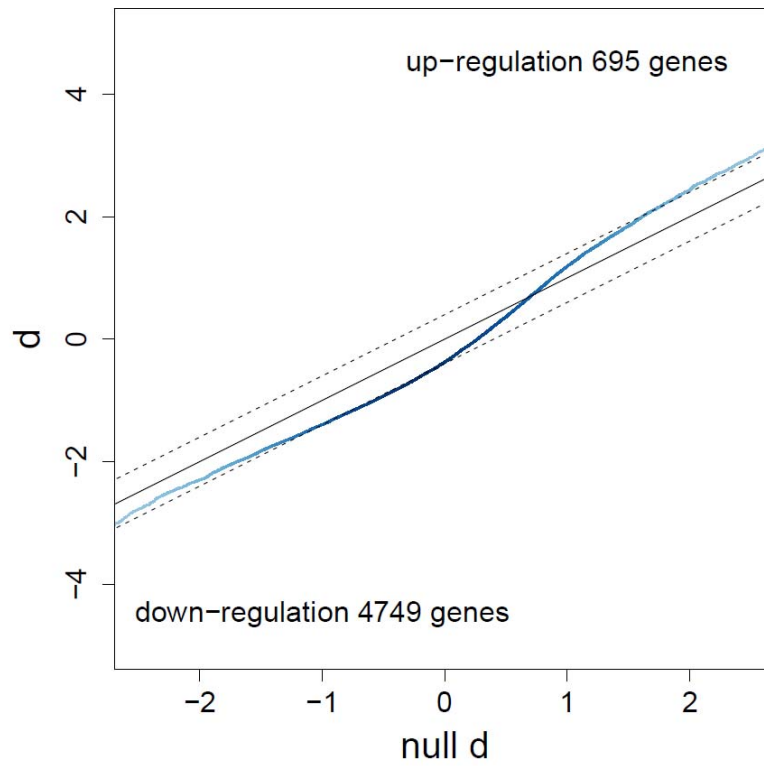
Primer	Sequence	Length	Tm	Product_Size
FECH_forward	GGATTTTCGGTACGTCCATCCT	21	61.3	95
FECH_reverse	TGTGGATACTGTGTGAAAGCAAT	23	60.2	95
HMOX1_forward	AAGACTGCGTTCCTGCTCAAC	21	62.9	247
HMOX1_reverse	AAAGCCCTACAGCAACTGTCTG	21	62.6	247
PLAUR_forward	TGTAAGACCAACGGGGATTGC	21	62.4	166
PLAUR_reverse	AGCCAGTCCGATAGCTCAGG	20	63	166
SLC25A37_forward	GATGGGGACAGCCGAGATG	19	61.9	146
SLC25A37_reverse	ACCGGGTACATGACCGAGT	19	62.3	146
ADIPOR1_forward	GAGGTGCGGGTACTGACAC	19	62	99
ADIPOR1_reverse	GATGACCCTCCAACGTCCC	19	61.7	99
SOD2_forward	GGAAGCCATCAAACGTGACTT	21	60.8	116
SOD2_reverse	CCCGTTCCTTATTGAAACCAAGC	23	61.9	116
BNIP3L_forward	GGTCCAGTAGACCCGAAAACA	21	61.4	209
BNIP3L_reverse	TGTGCTCAGTCGCTTTCCAAT	21	62.3	209
HK1_forward	CCAACATTCGTAAGGTCCATTCC	23	61.2	139
HK1_reverse	CCTCGGACTCCATGTGAACATT	22	62	139
CA1_forward	AAACGAGCCCCATTACAAAT	21	60.5	207
CA1_reverse	GGGGACAGCGTTATCACCTTC	21	62.5	207

SELENBP1_forward	TCATCTCCTCTCGCATCTATGTG	23	61	109
SELENBP1_reverse	AAGGCCAGTTCGCACTTGG	19	62.9	109
IL7R_forward	CTCCAACCGGCAGCAATGTAT	21	62.8	193
IL7R_reverse	AGATGACCAACAGAGCGACAG	21	61.8	193
CCR7_forward	ATTTGTTTCGTGGGCTACTG	21	60.6	76
CCR7_reverse	TCATGGTCTTGAGCCTCTTGA	21	60.5	76
S1PR1_forward	TCTGCTGGCAAATTCAAGCGA	21	62.9	99
S1PR1_reverse	GTTGTCCCCTTCGTCTTTCTG	21	60.6	99
ETS1_forward	GATAGTTGTGATCGCCTCACC	21	60.2	96
ETS1_reverse	GTCCTCTGAGTCGAAGCTGTC	21	61.8	96
PDK1_forward	GGATTGCCCATATCACGTCTTT	22	60.4	76
PDK1_reverse	TCCCGTAACCCTCTAGGGAATA	22	60.9	76
MAPK8_forward	TCTGGTATGATCCTTCTGAAGCA	23	60.6	127
MAPK8_reverse	TCCTCCAAGTCCATAACTTCCTT	23	60.4	127
GUSB_forward	GTCTGCGGCATTTTGTCGG	19	62	127
GUSB_reverse	CACACGATGGCATAGGAATGG	21	60.8	127

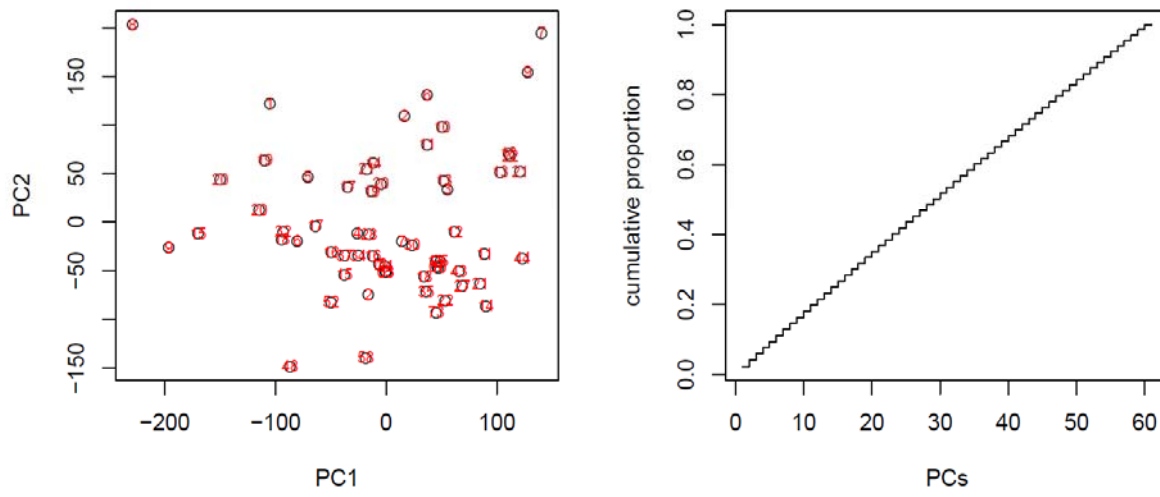
Supplemental Table 10. Primers used in validation of gene expression in SCD patients diagnosed with pre-capillary pulmonary hypertension.

Plate	Gene	log ₂ fold	P	r ²	slope
I	PLAUR	0.918	0.021	0.976	3.505
	IL7R	-1.742	0.00056	0.98	3.572
	ADIPOR1	1.609	0.0054	0.992	3.495
	HMOX1	1.403	0.000076	0.995	3.608
	SLC25A37	3.083	0.001	0.998	3.443
	SOD2	0.778	0.069	0.995	3.487
	SELENBP1	3.608	0.0015	0.997	3.698
	GUSB			0.996	3.53
II	CCR7	-2.489	0.000018	0.999	3.282
	PDK1	-0.943	0.00023	0.989	3.226
	HK1	0.378	0.33	1	3.579
	BNIP3L	2.725	0.0013	0.998	3.563
	ETS1	-1.512	0.00015	0.998	3.441
	FECH	3.117	0.00051	0.998	3.377
	MAPK8	-0.373	0.25	0.968	3.844
	CA1	6.271	0.00016	0.997	3.417
	S1PR1	-1.862	0.0004	0.998	3.421
	GUSB			0.998	3.412

Supplemental Table 11. The RT-qPCR results for the 16 genes and the internal reference gene *GUSB*. P values were obtained from two-sided two-sample t-test. r² and slope were obtained from standard curves for individual primer pairs.



Supplemental Figure 1. Gene expression alternation associated with hydroxyurea treatment in hemoglobin SS patients. A total of 5,444 genes were detected at FDR of 0.3, with the majority mildly suppressed by hydroxyurea treatment.



Supplemental Figure 2. No population stratification was detected among the combined Howard University and University of Chicago cohorts. (A) The top two axes of the genetic variation inferred from 148,365 SNPs (pruned from the 321,919 SNPs by pair-wise $r^2 > 0.3$, 50 SNP window with 5 SNP step). None of the samples appeared to be outliers, with maximum deviation of 2.82 SD from the mean of PC1 and 2.76 SD from the mean of PC2. (B) None of the PCs appeared to explain a significant proportion of total genetic variation.