

Table S1. Distribution of PAX3-FKHR sites in genome**Distribution of all sequence tags on chromosomes**

chromosome	length (Mb)	P3F	Input
1	245.5	326,932	335,400
2	243	362,359	372,101
3	199.5	347,353	357,650
4	191.4	266,548	271,344
5	180.9	228,670	231,621
6	171	229,196	234,513
7	158.6	231,279	237,383
8	146.3	191,113	192,882
9	138.4	188,589	194,175
10	135.4	167,483	169,791
11	134.5	164,860	168,761
12	132.4	176,159	179,749
13	114.1	149,042	153,163
14	106.4	107,219	109,545
15	100.3	120,897	124,298
16	88.8	107,257	109,687
17	78.8	100,230	105,101
18	76.1	99,065	100,440
19	63.8	61,574	65,355
20	62.4	137,962	142,667
21	46.9	48,702	50,302
22	49.6	46,717	49,493
X	154.8	89,562	90,692
Y	57.7	NA	NA
Total		3,948,768	4,046,113

Chromosome distribution of P3F binding sites

chromosome	length (Mb)	genes	transcripts	P3F	site/Mbp	ER	p53
1	245.5	2110	4258	133	0.54	398	55
2	243	1297	2476	126	0.52	295	44
3	199.5	1061	2030	110	0.55	256	20
4	191.4	765	1324	87	0.45	111	36
5	180.9	863	1637	87	0.48	247	27
6	171	1092	2070	84	0.49	262	30
7	158.6	939	1742	77	0.49	255	29
8	146.3	690	1200	70	0.48	244	30
9	138.4	844	1677	79	0.57	170	26
10	135.4	762	1624	88	0.65	213	29
11	134.5	1258	2164	68	0.51	142	23
12	132.4	1028	1943	67	0.51	163	33
13	114.1	335	630	51	0.45	59	14
14	106.4	633	1211	40	0.38	112	17
15	100.3	603	1138	54	0.54	86	19
16	88.8	844	1593	50	0.56	102	25
17	78.8	1191	2116	37	0.47	133	22
18	76.1	280	548	19	0.25	26	12
19	63.8	1325	2426	29	0.45	85	20
20	62.4	578	1136	49	0.79	150	9
21	46.9	236	488	17	0.36	66	6
22	49.6	502	942	12	0.24	36	7
X	154.8	836	1475	29	0.19	54	9
Y	57.7	67	139	0	0.00	0	0
Sum	3076.6	20139	37987	1463	0.48	3665	542

Table S2. Genes associated with proximal PAX3-FKHR binding sites

ID	Entrez Gene Name	Location	Type
ABAT	4-aminobutyrate aminotransferase	Cytoplasm	enzyme
ABCC1	ATP-binding cassette, sub-family C (CFTR/MRP), member 1	Plasma Membrane	transporter
ABI3BP	ABI family, member 3 (NESH) binding protein	Unknown	other
ABL1	c-abl oncogene 1, receptor tyrosine kinase	Nucleus	kinase
ABTB2	ankyrin repeat and BTB (POZ) domain containing 2	Unknown	other
ACCN1	amiloride-sensitive cation channel 1, neuronal	Plasma Membrane	ion channel
ACOX3	acyl-Coenzyme A oxidase 3, pristanoyl	Cytoplasm	enzyme
ACSS3	acyl-CoA synthetase short-chain family member 3	Unknown	enzyme
ACTL7B	actin-like 7B	Cytoplasm	other
ACTRT1	actin-related protein T1	Unknown	other
ACVR2A	activin A receptor, type IIA	Plasma Membrane	kinase
ADAM28	ADAM metalloproteinase domain 28	Plasma Membrane	peptidase
ADAMTS14	ADAM metalloproteinase with thrombospondin type 1 motif, 14	Extracellular Space	peptidase
ADAMTS15	ADAM metalloproteinase with thrombospondin type 1 motif, 15	Extracellular Space	peptidase
ADAMTS16	ADAM metalloproteinase with thrombospondin type 1 motif, 16	Extracellular Space	other
ADAMTSL1	ADAMTS-like 1	Extracellular Space	other
ADAR	adenosine deaminase, RNA-specific	Nucleus	enzyme
ADARB2	adenosine deaminase, RNA-specific, B2 (RED2 homolog rat)	Nucleus	enzyme
ADCY9	adenylate cyclase 9	Plasma Membrane	enzyme
ADM	adrenomedullin	Extracellular Space	other
ADRA1D	adrenergic, alpha-1D-, receptor	Plasma Membrane	G-protein coupled receptor
ADRA2A	adrenergic, alpha-2A-, receptor	Plasma Membrane	G-protein coupled receptor
ADRA2C	adrenergic, alpha-2C-, receptor	Plasma Membrane	G-protein coupled receptor
AFP	alpha-fetoprotein	Extracellular Space	transporter
AKAP2	A kinase (PRKA) anchor protein 2	Cytoplasm	other
AKT3	v-akt murine thymoma viral oncogene homolog 3 (protein kinase B, gamma)	Cytoplasm	kinase
ALCAM	activated leukocyte cell adhesion molecule	Plasma Membrane	other
ALDH1A3	aldehyde dehydrogenase 1 family, member A3	Cytoplasm	enzyme
ALK	anaplastic lymphoma receptor tyrosine kinase	Plasma Membrane	receptor kinase
ALOX15	arachidonate 15-lipoxygenase	Cytoplasm	enzyme
ALOX5AP	arachidonate 5-lipoxygenase-activating protein	Plasma Membrane	other
AMY1A	amylase, alpha 1A (salivary)	Extracellular Space	enzyme
ANGPT1	angiopoietin 1	Extracellular Space	growth factor
ANK2	ankyrin 2, neuronal	Plasma Membrane	other
ANK3	ankyrin 3, node of Ranvier (ankyrin G)	Plasma Membrane	other
ANKRD13A	ankyrin repeat domain 13A	Unknown	other
ANKRD20A3	ankyrin repeat domain 20 family, member A3	Unknown	other
ANKS1A	ankyrin repeat and sterile alpha motif domain containing 1A	Cytoplasm	other
TMEM16E	anoctamin 5	Cytoplasm	other
ANTXR2	anthrax toxin receptor 2	Plasma Membrane	other
ANXA10	annexin A10	Unknown	other
AP1S2	adaptor-related protein complex 1, sigma 2 subunit	Cytoplasm	transporter
AP3B1	adaptor-related protein complex 3, beta 1 subunit	Cytoplasm	transporter
APBA1	amyloid beta (A4) precursor protein-binding, family A, member 1	Cytoplasm	transporter
APBB2	amyloid beta (A4) precursor protein-binding, family B, member 2	Cytoplasm	other
APOB	apolipoprotein B (including Ag(x) antigen)	Extracellular Space	transporter
APP	amyloid beta (A4) precursor protein	Plasma Membrane	other
ARD1B	ARD1 homolog B (<i>S. cerevisiae</i>)	Unknown	other
ARFIP1	ADP-ribosylation factor interacting protein 1	Cytoplasm	other
ARGLU1	arginine and glutamate rich 1	Unknown	other
ARHGAP11B	Rho GTPase activating protein 11B	Unknown	other
ARHGAP15	Rho GTPase activating protein 15	Unknown	other
ARHGAP26	Rho GTPase activating protein 26	Cytoplasm	other
ARID1A	AT rich interactive domain 1A (SWI-like)	Nucleus	transcription regulator
ARID4B	AT rich interactive domain 4B (RBP1-like)	Nucleus	other
ARID5B	AT rich interactive domain 5B (MRF1-like)	Nucleus	transcription regulator
ARL4C	ADP-ribosylation factor-like 4C	Nucleus	enzyme
ARL5B	ADP-ribosylation factor-like 5B	Unknown	enzyme
ARMC3	armadillo repeat containing 3	Unknown	other
ARMC4	armadillo repeat containing 4	Unknown	other
ARRB1	arrestin, beta 1	Cytoplasm	other
ARRDC3	arrestin domain containing 3	Unknown	other
ASB3	ankyrin repeat and SOCS box-containing 3	Nucleus	transcription regulator
ASCC3	activating signal cointegrator 1 complex subunit 3	Nucleus	enzyme
ASS1	argininosuccinate synthetase 1	Cytoplasm	enzyme
ASTN2	astrotactin 2	Unknown	other
ATAD1	ATPase family, AAA domain containing 1	Unknown	other
ATAD2B	ATPase family, AAA domain containing 2B	Unknown	other

ATE1	arginyltransferase 1	Nucleus	enzyme
ATF3	activating transcription factor 3	Nucleus	transcription regulator
ATF6	activating transcription factor 6	Cytoplasm	transcription regulator
ARL6IP2	atlastin GTPase 2	Unknown	other
ATOH8	atonal homolog 8 (Drosophila)	Unknown	other
ATP11B	ATPase, class VI, type 11B	Plasma Membrane	transporter
ATP5J	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit F6	Cytoplasm	transporter
ATP8A2	ATPase, aminophospholipid transporter-like, class I, type 8A, member 2	Plasma Membrane	transporter
ATPBD3	ATP binding domain 3	Unknown	other
ATPBD4	ATP binding domain 4	Unknown	other
ATRN	attractin	Extracellular Space	other
AUTS2	autism susceptibility candidate 2	Unknown	other
BAALC	brain and acute leukemia, cytoplasmic	Cytoplasm	other
BAGE	B melanoma antigen	Unknown	other
BAI2	brain-specific angiogenesis inhibitor 2	Plasma Membrane	G-protein coupled receptor
BAI3	brain-specific angiogenesis inhibitor 3	Plasma Membrane	G-protein coupled receptor
BARX2	BARX homeobox 2	Nucleus	transcription regulator
BASP1	brain abundant, membrane attached signal protein 1	Plasma Membrane	other
BBS9	Bardet-Biedl syndrome 9	Extracellular Space	other
BCAR3	breast cancer anti-estrogen resistance 3	Cytoplasm	other
BCAS1	breast carcinoma amplified sequence 1	Unknown	other
BCHE	butyrylcholinesterase	Plasma Membrane	enzyme
BCKDHB	branched chain keto acid dehydrogenase E1, beta polypeptide	Cytoplasm	enzyme
BCL11A	B-cell CLL/lymphoma 11A (zinc finger protein)	Nucleus	transcription regulator
BCOR	BCL6 co-repressor	Nucleus	transcription regulator
BHLHB2	basic helix-loop-helix domain containing, class B, 2	Nucleus	transcription regulator
BHLHB5	basic helix-loop-helix domain containing, class B, 5	Nucleus	transcription regulator
BLID	BH3-like motif containing, cell death inducer	Cytoplasm	other
BMP10	bone morphogenetic protein 10	Extracellular Space	growth factor
BMP2K	BMP2 inducible kinase	Nucleus	kinase
BMP5	bone morphogenetic protein 5	Extracellular Space	growth factor
BMP7	bone morphogenetic protein 7	Extracellular Space	growth factor
BRUNOL4	bruno-like 4, RNA binding protein (Drosophila)	Nucleus	translation regulator
BRWD2	bromodomain and WD repeat domain containing 2	Unknown	other
BTBD9	BTB (POZ) domain containing 9	Unknown	other
BTN3A1	butyrophilin, subfamily 3, member A1	Unknown	other
C10orf107	chromosome 10 open reading frame 107	Unknown	other
C10orf122	chromosome 10 open reading frame 122	Unknown	other
C10orf26	chromosome 10 open reading frame 26	Unknown	other
C10orf28	chromosome 10 open reading frame 28	Unknown	other
C10orf53	chromosome 10 open reading frame 53	Unknown	other
C10orf71	chromosome 10 open reading frame 71	Unknown	other
C11orf41	chromosome 11 open reading frame 41	Unknown	other
C12orf12	chromosome 12 open reading frame 12	Unknown	other
C12orf36	chromosome 12 open reading frame 36	Unknown	other
C12orf66	chromosome 12 open reading frame 66	Unknown	other
C14orf101	chromosome 14 open reading frame 101	Unknown	other
C14orf105	chromosome 14 open reading frame 105	Unknown	other
C14orf118	chromosome 14 open reading frame 118	Unknown	other
C14orf145	chromosome 14 open reading frame 145	Unknown	other
C14orf147	chromosome 14 open reading frame 147	Unknown	other
C14orf177	chromosome 14 open reading frame 177	Unknown	other
C14orf37	chromosome 14 open reading frame 37	Unknown	other
C15orf53	chromosome 15 open reading frame 53	Unknown	other
C16orf45	chromosome 16 open reading frame 45	Unknown	other
C16orf73	chromosome 16 open reading frame 73	Unknown	other
C19orf41	chromosome 19 open reading frame 41	Unknown	other
C1orf110	chromosome 1 open reading frame 110	Unknown	other
C1orf201	chromosome 1 open reading frame 201	Unknown	other
C1orf95	chromosome 1 open reading frame 95	Unknown	other
C20orf152	chromosome 20 open reading frame 152	Unknown	other
C20orf39	chromosome 20 open reading frame 39	Unknown	other
C20orf85	chromosome 20 open reading frame 85	Unknown	other
C20orf94	chromosome 20 open reading frame 94	Unknown	other
C21orf34	chromosome 21 open reading frame 34	Unknown	other
C21orf45	chromosome 21 open reading frame 45	Unknown	other
C2orf37	chromosome 2 open reading frame 37	Unknown	other
C2orf47	chromosome 2 open reading frame 47	Unknown	other
C3orf56	chromosome 3 open reading frame 56	Unknown	other
C3orf57	chromosome 3 open reading frame 57	Unknown	other
C3orf59	chromosome 3 open reading frame 59	Unknown	other
C3orf65	chromosome 3 open reading frame 65	Unknown	other
C4orf22	chromosome 4 open reading frame 22	Unknown	other

C4orf33	chromosome 4 open reading frame 33	Unknown	other
C4orf6	chromosome 4 open reading frame 6	Unknown	other
C5orf15	chromosome 5 open reading frame 15	Unknown	other
C5orf23	chromosome 5 open reading frame 23	Unknown	other
C5orf36	chromosome 5 open reading frame 36	Unknown	other
C5orf43	chromosome 5 open reading frame 43	Unknown	other
C6	complement component 6	Extracellular Space	other
C6orf97	chromosome 6 open reading frame 97	Unknown	other
C8orf22	chromosome 8 open reading frame 22	Unknown	other
C8orf34	chromosome 8 open reading frame 34	Unknown	other
C9orf3	chromosome 9 open reading frame 3	Cytoplasm	peptidase
C9orf82	chromosome 9 open reading frame 82	Unknown	other
C9orf93	chromosome 9 open reading frame 93	Unknown	other
CA10	carbonic anhydrase X	Unknown	enzyme
CAB39	calcium binding protein 39	Cytoplasm	other
CABLES1	Cdk5 and Abl enzyme substrate 1	Nucleus	other
CACNA1E	calcium channel, voltage-dependent, R type, alpha 1E subunit	Plasma Membrane	ion channel
CACNB2	calcium channel, voltage-dependent, beta 2 subunit	Plasma Membrane	ion channel
CADM1	cell adhesion molecule 1	Plasma Membrane	other
CADM2	cell adhesion molecule 2	Unknown	other
CADPS	Ca ⁺⁺ -dependent secretion activator	Plasma Membrane	other
CALCR	calcitonin receptor	Plasma Membrane	G-protein coupled receptor
CAMK1G	calcium/calmodulin-dependent protein kinase IG	Cytoplasm	kinase
CAMK2D	calcium/calmodulin-dependent protein kinase II delta	Cytoplasm	kinase
CAND1	cullin-associated and neddylation-dissociated 1	Cytoplasm	transcription regulator
CARD11	caspase recruitment domain family, member 11	Cytoplasm	kinase
CASC4	cancer susceptibility candidate 4	Unknown	other
CBFA2T3	core-binding factor, runt domain, alpha subunit 2; translocated to, 3	Nucleus	transcription regulator
CBLB	Cas-Br-M (murine) ecotropic retroviral transforming sequence b	Nucleus	other
CBLN2	cerebellin 2 precursor	Extracellular Space	other
CCDC140	coiled-coil domain containing 140	Unknown	other
CCDC18	coiled-coil domain containing 18	Unknown	other
CCDC3	coiled-coil domain containing 3	Cytoplasm	other
CCDC80	coiled-coil domain containing 80	Nucleus	other
CCDC83	coiled-coil domain containing 83	Unknown	other
CCNI	cyclin I	Unknown	other
CCNT1	cyclin T1	Nucleus	transcription regulator
CGR6	chemokine (C-C motif) receptor 6	Plasma Membrane	G-protein coupled receptor
CD28	CD28 molecule	Plasma Membrane	other
CD55	CD55 molecule, decay accelerating factor for complement	Plasma Membrane	other
CD9	CD9 molecule	Plasma Membrane	other
CDCA7	cell division cycle associated 7	Nucleus	other
CDH11	cadherin 11, type 2, OB-cadherin (osteoblast)	Plasma Membrane	other
CDH12	cadherin 12, type 2 (N-cadherin 2)	Plasma Membrane	other
CDH13	cadherin 13, H-cadherin (heart)	Plasma Membrane	other
CDH19	cadherin 19, type 2	Plasma Membrane	other
CDH3	cadherin 3, type 1, P-cadherin (placental)	Plasma Membrane	other
CDH4	cadherin 4, type 1, R-cadherin (retinal)	Plasma Membrane	other
CDH5	cadherin 5, type 2 (vascular endothelium)	Plasma Membrane	other
CDH7	cadherin 7, type 2	Plasma Membrane	other
CDH8	cadherin 8, type 2	Plasma Membrane	other
CDH9	cadherin 9, type 2 (T1-cadherin)	Plasma Membrane	other
CDK6	cyclin-dependent kinase 6	Nucleus	kinase
CDON	Cdon homolog (mouse)	Plasma Membrane	other
CDYL	chromodomain protein, Y-like	Nucleus	transcription regulator
CEP152	centrosomal protein 152kDa	Cytoplasm	other
CEP350	centrosomal protein 350kDa	Cytoplasm	other
CGA	glycoprotein hormones, alpha polypeptide	Extracellular Space	other
CGN	cingulin	Plasma Membrane	other
CHD7	chromodomain helicase DNA binding protein 7	Nucleus	enzyme
CHL1	cell adhesion molecule with homology to L1CAM	Plasma Membrane	other
CHMP2B	chromatin modifying protein 2B	Cytoplasm	other
CHODL	chondrolectin	Plasma Membrane	other
CHRNB3	cholinergic receptor, nicotinic, beta 3	Plasma Membrane	transmembrane receptor
CHST11	carbohydrate (chondroitin 4) sulfotransferase 11	Cytoplasm	enzyme
CHST8	carbohydrate (N-acetylgalactosamine 4-O) sulfotransferase 8	Cytoplasm	enzyme
CHST9	carbohydrate (N-acetylgalactosamine 4-O) sulfotransferase 9	Cytoplasm	enzyme
CHSY1	chondroitin sulfate synthase 1	Cytoplasm	enzyme
CITED2	Cbp/p300-interacting transactivator, with Glu/Asp-rich carboxy-terminal domain, 2	Nucleus	transcription regulator
CLASP1	cytoplasmic linker associated protein 1	Cytoplasm	other
CLDN23	claudin 23	Plasma Membrane	other
CLEC14A	C-type lectin domain family 14, member A	Unknown	other

CLIP1	CAP-GLY domain containing linker protein 1	Cytoplasm	other
CLLU1	chronic lymphocytic leukemia up-regulated 1	Unknown	other
CLMN	calmin (calponin-like, transmembrane)	Cytoplasm	other
CNBD1	cyclic nucleotide binding domain containing 1	Unknown	other
COG2	component of oligomeric golgi complex 2	Cytoplasm	transporter
COL21A1	collagen, type XXI, alpha 1	Extracellular Space	other
COL22A1	collagen, type XXII, alpha 1	Extracellular Space	other
COL25A1	collagen, type XXV, alpha 1	Cytoplasm	other
COL28A1	collagen, type XXVIII, alpha 1	Unknown	other
COLQ	collagen-like tail subunit (single strand of homotrimer) of asymmetric acetylcholinesterase	Extracellular Space	other
COPS8	COP9 constitutive photomorphogenic homolog subunit 8	Cytoplasm	other
COX10	COX10 homolog, cytochrome c oxidase assembly protein, heme A: farnesyltransferase (yeast)	Cytoplasm	enzyme
COX7A2L	cytochrome c oxidase subunit VIIa polypeptide 2 like	Cytoplasm	enzyme
CPA5	carboxypeptidase A5	Extracellular Space	peptidase
CPD	carboxypeptidase D	Extracellular Space	peptidase
CRBN	cereblon	Unknown	enzyme
CREG2	cellular repressor of E1A-stimulated genes 2	Extracellular Space	enzyme
CRISP1	cysteine-rich secretory protein 1	Extracellular Space	other
CRTAM	cytotoxic and regulatory T cell molecule	Plasma Membrane	other
CRX	cone-rod homeobox	Nucleus	transcription regulator
CRYBA4	crystallin, beta A4	Unknown	other
CSMD3	CUB and Sushi multiple domains 3	Unknown	enzyme
CSRP3	cysteine and glycine-rich protein 3 (cardiac LIM protein)	Nucleus	other
CST11	cystatin 11	Extracellular Space	other
CSTF2T	cleavage stimulation factor, 3' pre-RNA, subunit 2, 64kDa, tau variant	Nucleus	other
CTAGE1	cutaneous T-cell lymphoma-associated antigen 1	Unknown	other
CTLA4	cytotoxic T-lymphocyte-associated protein 4	Plasma Membrane	other
CTNNA3	catenin (cadherin-associated protein), alpha 3	Plasma Membrane	other
CTNBL1	catenin, beta like 1	Nucleus	other
CTR9	Ctr9, Paf1/RNA polymerase II complex component, homolog (S. cerevisiae)	Nucleus	other
CTTNBP2NL	CTTNBP2 N-terminal like	Cytoplasm	other
CUGBP2	CUG triplet repeat, RNA binding protein 2	Nucleus	other
CXCR4	chemokine (C-X-C motif) receptor 4	Plasma Membrane	G-protein coupled receptor
CXCR7	chemokine (C-X-C motif) receptor 7	Plasma Membrane	G-protein coupled receptor
CXorf48	chromosome X open reading frame 48	Unknown	other
CYLC2	cylicin, basic protein of sperm head cytoskeleton 2	Cytoplasm	other
DAB1	disabled homolog 1 (Drosophila)	Cytoplasm	other
DAB2IP	DAB2 interacting protein	Plasma Membrane	other
DACT1	dapper, antagonist of beta-catenin, homolog 1 (Xenopus laevis)	Cytoplasm	other
DAPK1	death-associated protein kinase 1	Cytoplasm	kinase
DARS	aspartyl-tRNA synthetase	Cytoplasm	enzyme
DBC1	deleted in bladder cancer 1	Nucleus	peptidase
DCLK1	doublecortin-like kinase 1	Cytoplasm	kinase
DDHD1	DDHD domain containing 1	Unknown	enzyme
DDIT4L	DNA-damage-inducible transcript 4-like	Unknown	other
DDX1	DEAD (Asp-Glu-Ala-Asp) box polypeptide 1	Nucleus	enzyme
DGKB	diacylglycerol kinase, beta 90kDa	Cytoplasm	kinase
DHFR	dihydrofolate reductase	Unknown	enzyme
DIAPH3	diaphanous homolog 3 (Drosophila)	Cytoplasm	enzyme
DIS3L	DIS3 mitotic control homolog (S. cerevisiae)-like	Unknown	other
DKK2	dickkopf homolog 2 (Xenopus laevis)	Extracellular Space	other
DLG5	discs, large homolog 5 (Drosophila)	Plasma Membrane	other
DMRT2	doublesex and mab-3 related transcription factor 2	Nucleus	transcription regulator
DMRTA2	DMRT-like family A2	Nucleus	transcription regulator
DNM3	dynammin 3	Cytoplasm	enzyme
DOCK10	dedicator of cytokinesis 10	Unknown	other
DOCK5	dedicator of cytokinesis 5	Unknown	other
DOCK8	dedicator of cytokinesis 8	Unknown	other
DOK5	docking protein 5	Plasma Membrane	other
DPH5	DPH5 homolog (S. cerevisiae)	Unknown	enzyme
DPP10	dipeptidyl-peptidase 10	Unknown	peptidase
DPP6	dipeptidyl-peptidase 6	Plasma Membrane	peptidase
DPY19L2	dpy-19-like 2 (C. elegans)	Unknown	other
DPYD	dihydropyrimidine dehydrogenase	Cytoplasm	enzyme
DRD1	dopamine receptor D1	Plasma Membrane	G-protein coupled receptor
DSEL	dermatan sulfate epimerase-like	Unknown	enzyme
DST	dystonin	Plasma Membrane	other
DUSP22	dual specificity phosphatase 22	Cytoplasm	phosphatase
DYNC1L12	dynein, cytoplasmic 1, light intermediate chain 2	Cytoplasm	other
DYRK2	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2	Cytoplasm	kinase

EBF1	early B-cell factor 1	Nucleus	transcription regulator
EDAR	ectodysplasin A receptor	Plasma Membrane	transmembrane receptor
EDEM1	ER degradation enhancer, mannosidase alpha-like 1	Cytoplasm	enzyme
EDNRB	endothelin receptor type B	Plasma Membrane	G-protein coupled receptor
EEA1	early endosome antigen 1	Cytoplasm	other
EEF2K	eukaryotic elongation factor-2 kinase	Cytoplasm	kinase
EFCAB1	EF-hand calcium binding domain 1	Unknown	other
EFNA5	ephrin-A5	Plasma Membrane	kinase
EFNB2	ephrin-B2	Plasma Membrane	other
EHHADH	enoyl-Coenzyme A, hydratase/3-hydroxyacyl Coenzyme A dehydrogenase	Cytoplasm	enzyme
ELAVL2	ELAV (embryonic lethal, abnormal vision, Drosophila)-like 2 (Hu antigen B)	Cytoplasm	other
ELMO1	engulfment and cell motility 1	Cytoplasm	other
ELTD1	EGF, latrophilin and seven transmembrane domain containing 1	Plasma Membrane	G-protein coupled receptor
ENAH	enabled homolog (Drosophila)	Cytoplasm	other
ENC1	ectodermal-neural cortex (with BTB-like domain)	Nucleus	peptidase
ENOX1	ecto-NOX disulfide-thiol exchanger 1	Unknown	peptidase
ENPEP	glutamyl aminopeptidase (aminopeptidase A)	Plasma Membrane	peptidase
EPAS1	endothelial PAS domain protein 1	Nucleus	transcription regulator
EPC1	enhancer of polycomb homolog 1 (Drosophila)	Nucleus	transcription regulator
EPHA4	EPH receptor A4	Plasma Membrane	kinase
EPHA7	EPH receptor A7	Plasma Membrane	kinase
EPHB2	EPH receptor B2	Plasma Membrane	kinase
ERBB4	v-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian)	Plasma Membrane	kinase
ERC2	ELKS/RAB6-interacting/CAST family member 2	Cytoplasm	other
ERICH1	glutamate-rich 1	Unknown	other
ERO1L	ERO1-like (S. cerevisiae)	Cytoplasm	enzyme
ERRF11	ERBB receptor feedback inhibitor 1	Cytoplasm	other
ETS1	v-ets erythroblastosis virus E26 oncogene homolog 1 (avian)	Nucleus	transcription regulator
ETV5	ets variant 5	Nucleus	transcription regulator
EXO1	exonuclease 1	Nucleus	enzyme
EYA1	eyes absent homolog 1 (Drosophila)	Nucleus	phosphatase
EYA2	eyes absent homolog 2 (Drosophila)	Nucleus	phosphatase
EYA4	eyes absent homolog 4 (Drosophila)	Cytoplasm	phosphatase
F12	coagulation factor XII (Hageman factor)	Extracellular Space	peptidase
FAM107A	family with sequence similarity 107, member A	Nucleus	other
FAM110B	family with sequence similarity 110, member B	Unknown	other
FAM124B	family with sequence similarity 124B	Unknown	other
FAM127C	family with sequence similarity 127, member C	Unknown	other
FAM155A	family with sequence similarity 155, member A	Unknown	other
FAM163A	family with sequence similarity 163, member A	Unknown	other
FAM169B	family with sequence similarity 169, member B	Unknown	other
FAM170A	family with sequence similarity 170, member A	Unknown	other
C10orf6	family with sequence similarity 178, member A	Unknown	other
FAM19A2	family with sequence similarity 19 (chemokine (C-C motif)-like), member A2	Cytoplasm	other
FAM19A5	family with sequence similarity 19 (chemokine (C-C motif)-like), member A5	Extracellular Space	other
FAM20A	family with sequence similarity 20, member A	Extracellular Space	other
FAM46A	family with sequence similarity 46, member A	Unknown	other
FAM47B	family with sequence similarity 47, member B	Unknown	other
FAM75B	family with sequence similarity 75, member B	Unknown	other
FAM81A	family with sequence similarity 81, member A	Unknown	other
FAM84A	family with sequence similarity 84, member A	Unknown	other
FAM84B	family with sequence similarity 84, member B	Plasma Membrane	other
FAM89A	family with sequence similarity 89, member A	Unknown	other
FAM92B	family with sequence similarity 92, member B	Unknown	other
FAR2	fatty acyl CoA reductase 2	Cytoplasm	enzyme
FAT4	FAT tumor suppressor homolog 4 (Drosophila)	Unknown	other
FBXL7	F-box and leucine-rich repeat protein 7	Cytoplasm	enzyme
FBXO31	F-box protein 31	Unknown	other
FBXO42	F-box protein 42	Unknown	other
FCRLB	Fc receptor-like B	Unknown	other
FDX1	ferredoxin 1	Cytoplasm	transporter
FGF10	fibroblast growth factor 10	Extracellular Space	growth factor
FGF8	fibroblast growth factor 8 (androgen-induced)	Extracellular Space	growth factor
FGFR2	fibroblast growth factor receptor 2	Plasma Membrane	receptor kinase
FGFR4	fibroblast growth factor receptor 4	Plasma Membrane	receptor kinase
FGGY	FGGY carbohydrate kinase domain containing	Unknown	other
FHL2	four and a half LIM domains 2	Nucleus	other
FIGLA	folliculogenesis specific basic helix-loop-helix	Nucleus	other
FIGN	fidgetin	Nucleus	other

FLNB	filamin B, beta (actin binding protein 278)	Cytoplasm	other
FLRT2	fibronectin leucine rich transmembrane protein 2	Plasma Membrane	other
FLVCR2	feline leukemia virus subgroup C cellular receptor family, member 2	Plasma Membrane	transporter
FMN1	formin 1	Nucleus	transporter
FNBP1	formin binding protein 1	Nucleus	enzyme
FOXA2	forkhead box A2	Nucleus	transcription regulator
FOXD1	forkhead box D1	Nucleus	transcription regulator
FOXF1	forkhead box F1	Nucleus	transcription regulator
FOXG1	forkhead box G1	Nucleus	transcription regulator
FOXL1	forkhead box L1	Nucleus	transcription regulator
FOXN2	forkhead box N2	Nucleus	transcription regulator
FOXO1	forkhead box O1	Nucleus	transcription regulator
FREQ	frequenin homolog (Drosophila)	Cytoplasm	other
FRG1	FSHD region gene 1	Nucleus	transporter
FRMD4A	FERM domain containing 4A	Unknown	other
FRY	furry homolog (Drosophila)	Unknown	other
FSCB	fibrous sheath CABYR binding protein	Plasma Membrane	other
FST	follicistatin	Extracellular Space	other
FUT10	fucosyltransferase 10 (alpha (1,3) fucosyltransferase)	Cytoplasm	enzyme
FYN	FYN oncogene related to SRC, FGR, YES	Plasma Membrane	kinase
FZD8	frizzled homolog 8 (Drosophila)	Plasma Membrane	G-protein coupled receptor
G3BP1	GTPase activating protein (SH3 domain) binding protein 1	Nucleus	enzyme
GABRG3	gamma-aminobutyric acid (GABA) A receptor, gamma 3	Plasma Membrane	ion channel
GADD45A	growth arrest and DNA-damage-inducible, alpha	Nucleus	other
GADD45G	growth arrest and DNA-damage-inducible, gamma	Nucleus	other
GADL1	glutamate decarboxylase-like 1	Unknown	enzyme
GALC	galactosylceramidase	Cytoplasm	enzyme
GALNT13	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 13 (GalNAc-T13)	Cytoplasm	enzyme
GALR1	galanin receptor 1	Plasma Membrane	G-protein coupled receptor
GAS1	growth arrest-specific 1	Plasma Membrane	other
GBE1	glucan (1,4-alpha-), branching enzyme 1	Cytoplasm	enzyme
GBF1	golgi-specific brefeldin A resistant guanine nucleotide exchange factor 1	Cytoplasm	other
Gcom1	GRINL1A complex locus	Unknown	other
GDAP1L1	ganglioside-induced differentiation-associated protein 1-like 1	Unknown	other
GDF10	growth differentiation factor 10	Extracellular Space	growth factor
GFRAL	GDNF family receptor alpha like	Unknown	other
GK	glycerol kinase	Cytoplasm	kinase
GK2	glycerol kinase 2	Cytoplasm	kinase
GLB1L2	galactosidase, beta 1-like 2	Unknown	other
GMPR	guanosine monophosphate reductase	Cytoplasm	enzyme
GNAI1	guanine nucleotide binding protein (G protein), alpha inhibiting activity polypeptide 1	Plasma Membrane	enzyme
GNAL	guanine nucleotide binding protein (G protein), alpha activating activity polypeptide, olfactory type	Cytoplasm	enzyme
GNRHR	gonadotropin-releasing hormone receptor	Plasma Membrane	G-protein coupled receptor
GOLGA7	golgi autoantigen, golgin subfamily a, 7	Cytoplasm	other
GOT2	glutamic-oxaloacetic transaminase 2, mitochondrial (aspartate aminotransferase 2)	Cytoplasm	enzyme
GP6	glycoprotein VI (platelet)	Plasma Membrane	transmembrane receptor
GPHN	gephyrin	Plasma Membrane	enzyme
GPR107	G protein-coupled receptor 107	Plasma Membrane	G-protein coupled receptor
GPR126	G protein-coupled receptor 126	Plasma Membrane	G-protein coupled receptor
GPR135	G protein-coupled receptor 135	Plasma Membrane	G-protein coupled receptor
GPR137B	G protein-coupled receptor 137B	Plasma Membrane	G-protein coupled receptor
GPR61	G protein-coupled receptor 61	Plasma Membrane	G-protein coupled receptor
GPR63	G protein-coupled receptor 63	Plasma Membrane	G-protein coupled receptor
GPRC5A	G protein-coupled receptor, family C, group 5, member A	Plasma Membrane	G-protein coupled receptor
GRAMD3	GRAM domain containing 3	Unknown	other
GRIA3	glutamate receptor, ionotropic, AMPA 3	Plasma Membrane	ion channel
GRID2	glutamate receptor, ionotropic, delta 2	Plasma Membrane	ion channel
GRIFIN	galectin-related inter-fiber protein	Plasma Membrane	other
GRIK2	glutamate receptor, ionotropic, kainate 2	Plasma Membrane	ion channel
GRIN2B	glutamate receptor, ionotropic, N-methyl D-aspartate 2B	Plasma Membrane	ion channel
GRIP1	glutamate receptor interacting protein 1	Plasma Membrane	other
GRM3	glutamate receptor, metabotropic 3	Plasma Membrane	G-protein coupled receptor
GRTP1	growth hormone regulated TBC protein 1	Extracellular Space	other
MLZE	gasdermin C	Cytoplasm	other
GTF3A	general transcription factor IIIA	Nucleus	transcription regulator
GUCA1A	guanylate cyclase activator 1A (retina)	Cytoplasm	other
GUCY1A2	guanylate cyclase 1, soluble, alpha 2	Cytoplasm	enzyme
H2AFY	H2A histone family, member Y	Nucleus	other
H3F3A			

HAO2	hydroxyacid oxidase 2 (long chain)	Cytoplasm	enzyme
HAS2	hyaluronan synthase 2	Plasma Membrane	enzyme
HCK	hemopoietic cell kinase	Cytoplasm	kinase
HDAC5	histone deacetylase 5	Nucleus	transcription regulator
HDAC9	histone deacetylase 9	Nucleus	transcription regulator
HEBP2	heme binding protein 2	Cytoplasm	other
HECA	headcase homolog (Drosophila)	Unknown	other
HIST1H1C	histone cluster 1, H1c	Nucleus	other
HIVEP1	human immunodeficiency virus type I enhancer binding protein 1	Nucleus	transcription regulator
HLX	H2.0-like homeobox	Nucleus	transcription regulator
HMCN1	hemicentin 1	Extracellular Space	other
HMG1L1	high-mobility group box 1-like 1	Nucleus	other
HMG2	high mobility group AT-hook 2	Nucleus	other
HPSE2	heparanase 2	Unknown	enzyme
HS1BP3	HCLS1 binding protein 3	Unknown	other
HS3ST3B1	heparan sulfate (glucosamine) 3-O-sulfotransferase 3B1	Cytoplasm	enzyme
HSBP1	heat shock factor binding protein 1	Nucleus	transcription regulator
HSD17B7	hydroxysteroid (17-beta) dehydrogenase 7	Cytoplasm	enzyme
HSD3B1	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 1	Cytoplasm	enzyme
HSF2BP	heat shock transcription factor 2 binding protein	Cytoplasm	other
HSPG2	heparan sulfate proteoglycan 2	Plasma Membrane	other
HTATIP2	HIV-1 Tat interactive protein 2, 30kDa	Nucleus	transcription regulator
HTR1E	5-hydroxytryptamine (serotonin) receptor 1E	Plasma Membrane	G-protein coupled receptor
ICOS	inducible T-cell co-stimulator	Plasma Membrane	other
IFI16	interferon, gamma-inducible protein 16	Nucleus	transcription regulator
IFNG	interferon, gamma	Extracellular Space	cytokine
IGF1R	insulin-like growth factor 1 receptor	Plasma Membrane	receptor kinase
IGFBP4	insulin-like growth factor binding protein 4	Extracellular Space	other
IGFBPL1	insulin-like growth factor binding protein-like 1	Unknown	other
IKBKAP	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase complex-associated protein	Cytoplasm	other
IL17RD	interleukin 17 receptor D	Cytoplasm	other
IL20RB	interleukin 20 receptor beta	Plasma Membrane	other
IL4R	interleukin 4 receptor	Plasma Membrane	transmembrane receptor
IMMP2L	IMP2 inner mitochondrial membrane peptidase-like (S. cerevisiae)	Cytoplasm	peptidase
IMPG1	interphotoreceptor matrix proteoglycan 1	Unknown	other
IMPG2	interphotoreceptor matrix proteoglycan 2	Extracellular Space	other
INPP4B	inositol polyphosphate-4-phosphatase, type II, 105kDa	Unknown	phosphatase
INPP5A	inositol polyphosphate-5-phosphatase, 40kDa	Plasma Membrane	phosphatase
INTU	inturned planar cell polarity effector homolog (Drosophila)	Unknown	other
INVS	inversin	Nucleus	transcription regulator
IQCG	IQ motif containing G	Unknown	other
IQCH	IQ motif containing H	Unknown	other
IRAK1BP1	interleukin-1 receptor-associated kinase 1 binding protein 1	Unknown	other
IRAK3	interleukin-1 receptor-associated kinase 3	Extracellular Space	kinase
IRF8	interferon regulatory factor 8	Nucleus	transcription regulator
IRS1	insulin receptor substrate 1	Cytoplasm	other
IRX1	iroquois homeobox 1	Nucleus	transcription regulator
ITGA10	integrin, alpha 10	Plasma Membrane	other
ITGB1	integrin, beta 1 (fibronectin receptor, beta polypeptide, antigen CD29 includes MDF2, MSK12)	Plasma Membrane	transmembrane receptor
ITGB8	integrin, beta 8	Plasma Membrane	other
ITGBL1	integrin, beta-like 1 (with EGF-like repeat domains)	Unknown	other
ITPKB	inositol 1,4,5-trisphosphate 3-kinase B	Cytoplasm	kinase
ITPR1	inositol 1,4,5-triphosphate receptor, type 1	Cytoplasm	ion channel
ITSN2	intersectin 2	Cytoplasm	other
JAKMIP1	janus kinase and microtubule interacting protein 1	Cytoplasm	other
JAKMIP2	janus kinase and microtubule interacting protein 2	Unknown	other
KANK2	KN motif and ankyrin repeat domains 2	Nucleus	transcription regulator
KBTD8	kelch repeat and BTB (POZ) domain containing 8	Unknown	other
KCNA4	potassium voltage-gated channel, shaker-related subfamily, member 4	Plasma Membrane	ion channel
KCNB2	potassium voltage-gated channel, Shab-related subfamily, member 2	Plasma Membrane	ion channel
KCNC2	potassium voltage-gated channel, Shaw-related subfamily, member 2	Plasma Membrane	ion channel
KCND3	potassium voltage-gated channel, Shal-related subfamily, member 3	Plasma Membrane	ion channel
KCNH7	potassium voltage-gated channel, subfamily H (eag-related), member 7	Plasma Membrane	ion channel
KCNIP4	Kv channel interacting protein 4	Plasma Membrane	ion channel
KCNMA1	potassium large conductance calcium-activated channel, subfamily M, alpha member 1	Plasma Membrane	ion channel
KCNMB2	potassium large conductance calcium-activated channel, subfamily M, beta member 2	Plasma Membrane	ion channel
KCNRG	potassium channel regulator	Unknown	ion channel
KCTD2	potassium channel tetramerisation domain containing 2	Unknown	ion channel

KDR	kinase insert domain receptor (a type III receptor tyrosine kinase)	Plasma Membrane	receptor kinase
KHDRBS3	KH domain containing, RNA binding, signal transduction associated 3	Nucleus	other
KIAA0368	KIAA0368	Cytoplasm	other
KIAA0406	KIAA0406	Unknown	other
KIAA0774	KIAA0774	Unknown	other
KIAA0907	KIAA0907	Unknown	other
KIAA0922	KIAA0922	Unknown	other
KIAA1217	KIAA1217	Cytoplasm	other
KIAA1324L	KIAA1324-like	Unknown	other
KIAA1432	KIAA1432	Unknown	other
KIAA1529	KIAA1529	Unknown	other
KIAA1797	KIAA1797	Unknown	other
KIAA1853	KIAA1853	Unknown	other
KIF13A	kinesin family member 13A	Cytoplasm	transporter
KIF26B	kinesin family member 26B	Unknown	other
KIF2B	kinesin family member 2B	Cytoplasm	other
KIRREL3	kin of IRRE like 3 (Drosophila)	Extracellular Space	other
KLF4	Kruppel-like factor 4 (gut)	Nucleus	transcription regulator
KLF7	Kruppel-like factor 7 (ubiquitous)	Nucleus	transcription regulator
KLHDC5	kelch domain containing 5	Unknown	other
KLHL1	kelch-like 1 (Drosophila)	Cytoplasm	other
KLHL13	kelch-like 13 (Drosophila)	Unknown	other
KLRG1	killer cell lectin-like receptor subfamily G, member 1	Plasma Membrane	other
KSR2	kinase suppressor of ras 2	Cytoplasm	kinase
LAMC1	laminin, gamma 1 (formerly LAMB2)	Extracellular Space	other
LAPTM4B	lysosomal protein transmembrane 4 beta	Unknown	other
LARGE	like-glycosyltransferase	Cytoplasm	enzyme
LDLR	low density lipoprotein receptor	Plasma Membrane	transporter
DLRAD3	low density lipoprotein receptor class A domain containing 3	Unknown	other
LEPREL1	leprecan-like 1	Unknown	enzyme
LIMCH1	LIM and calponin homology domains 1	Unknown	other
LIMD1	LIM domains containing 1	Nucleus	other
LIPC	lipase, hepatic	Extracellular Space	enzyme
LMO1	LIM domain only 1 (rhombotin 1)	Nucleus	transcription regulator
LMO3	LIM domain only 3 (rhombotin-like 2)	Nucleus	other
LMO4	LIM domain only 4	Nucleus	transcription regulator
LNX1	ligand of numb-protein X 1	Extracellular Space	enzyme
LOXL1	lysyl oxidase-like 1	Extracellular Space	enzyme
LPHN2	latrophilin 2	Plasma Membrane	G-protein coupled receptor
LPHN3	latrophilin 3	Plasma Membrane	G-protein coupled receptor
LRCH1	leucine-rich repeats and calponin homology (CH) domain containing 1	Unknown	other
LRFN5	leucine rich repeat and fibronectin type III domain containing 5	Nucleus	other
LRIG3	leucine-rich repeats and immunoglobulin-like domains 3	Unknown	other
LRP1B	low density lipoprotein-related protein 1B (deleted in tumors)	Plasma Membrane	transmembrane receptor
LRRC3B	leucine rich repeat containing 3B	Unknown	other
LRRC4C	leucine rich repeat containing 4C	Plasma Membrane	other
LRRC61	leucine rich repeat containing 61	Unknown	other
LRRFIP1	leucine rich repeat (in FLII) interacting protein 1	Nucleus	transcription regulator
LRRFIP2	leucine rich repeat (in FLII) interacting protein 2	Unknown	other
LRRN2	leucine rich repeat neuronal 2	Plasma Membrane	other
LRRTM3	leucine rich repeat transmembrane neuronal 3	Unknown	other
LUZP2	leucine zipper protein 2	Unknown	other
LYN	v-yes-1 Yamaguchi sarcoma viral related oncogene homolog	Cytoplasm	kinase
LYPLAL1	lysophospholipase-like 1	Cytoplasm	enzyme
MAB21L1	mab-21-like 1 (C. elegans)	Unknown	other
MAD2L1	MAD2 mitotic arrest deficient-like 1 (yeast)	Nucleus	other
MAF	v-maf musculoaponeurotic fibrosarcoma oncogene homolog (avian)	Nucleus	transcription regulator
MAGEA5	melanoma antigen family A, 5	Unknown	other
MAGEB18	melanoma antigen family B, 18	Unknown	other
MAGEB6	melanoma antigen family B, 6	Unknown	other
MAGEC3	melanoma antigen family C, 3	Unknown	other
MAGI1	membrane associated guanylate kinase, WW and PDZ domain containing 1	Plasma Membrane	kinase
MAGI2	membrane associated guanylate kinase, WW and PDZ domain containing 2	Plasma Membrane	kinase
MAK16	MAK16 homolog (S. cerevisiae)	Nucleus	other
MAML3	mastermind-like 3 (Drosophila)	Nucleus	transcription regulator
MAOA	monoamine oxidase A	Cytoplasm	enzyme
MAP1B	microtubule-associated protein 1B	Cytoplasm	other
MAP2K5	mitogen-activated protein kinase kinase 5	Cytoplasm	kinase
MAP2K6	mitogen-activated protein kinase kinase 6	Cytoplasm	kinase
MAP3K2	mitogen-activated protein kinase kinase kinase 2	Cytoplasm	kinase
MAP3K7	mitogen-activated protein kinase kinase kinase 7	Cytoplasm	kinase

MAP3K8	mitogen-activated protein kinase kinase kinase 8	Cytoplasm	kinase
MARCKS	myristoylated alanine-rich protein kinase C substrate	Plasma Membrane	other
MATN2	matrilin 2	Extracellular Space	other
MBTPS2	membrane-bound transcription factor peptidase, site 2	Cytoplasm	peptidase
MCC	mutated in colorectal cancers	Unknown	other
MCTP2	multiple C2 domains, transmembrane 2	Unknown	other
MDGA2	MAM domain containing glycosylphosphatidylinositol anchor 2	Unknown	other
MDM1	Mdm1 nuclear protein homolog (mouse)	Unknown	other
MED13L	mediator complex subunit 13-like	Nucleus	other
MED27	mediator complex subunit 27	Nucleus	transcription regulator
MEGF10	multiple EGF-like-domains 10	Unknown	other
MEIS1	Meis homeobox 1	Nucleus	transcription regulator
MEOX1	mesenchyme homeobox 1	Nucleus	transcription regulator
MEOX2	mesenchyme homeobox 2	Nucleus	transcription regulator
MET	met proto-oncogene (hepatocyte growth factor receptor)	Plasma Membrane	receptor kinase
MEX3B	mex-3 homolog B (C. elegans)	Unknown	kinase
MFHAS1	malignant fibrous histiocytoma amplified sequence 1	Cytoplasm	other
MFSD2	major facilitator superfamily domain containing 2	Unknown	other
MID1IP1	MID1 interacting protein 1 (gastrulation specific G12 homolog (zebrafish))	Cytoplasm	other
MME	membrane metallo-endopeptidase	Plasma Membrane	peptidase
MMP3	matrix metalloproteinase 3 (stromelysin 1, progelatinase)	Extracellular Space	peptidase
MN1	meningioma (disrupted in balanced translocation) 1	Nucleus	other
MOGAT1	monoacylglycerol O-acyltransferase 1	Unknown	enzyme
MPDZ	multiple PDZ domain protein	Plasma Membrane	other
MPP2	membrane protein, palmitoylated 2 (MAGUK p55 subfamily member 2)	Plasma Membrane	kinase
MPPED2	metallophosphoesterase domain containing 2	Unknown	other
MRPL13	mitochondrial ribosomal protein L13	Cytoplasm	other
MRPS33	mitochondrial ribosomal protein S33	Cytoplasm	other
MRT04	mRNA turnover 4 homolog (S. cerevisiae)	Cytoplasm	other
MSI2	musashi homolog 2 (Drosophila)	Cytoplasm	other
MSRB2	methionine sulfoxide reductase B2	Nucleus	transcription regulator
MSX2	msh homeobox 2	Nucleus	transcription regulator
MTHFSD	methenyltetrahydrofolate synthetase domain containing	Unknown	other
MTIF3	mitochondrial translational initiation factor 3	Cytoplasm	translation regulator
MTMR7	myotubularin related protein 7	Cytoplasm	phosphatase
MXRA5	matrix-remodelling associated 5	Unknown	other
MYCN	v-myc myelocytomatosis viral related oncogene, neuroblastoma derived (avian)	Nucleus	transcription regulator
MYF6	myogenic factor 6 (herculin)	Nucleus	transcription regulator
MYO16	myosin XVI	Cytoplasm	other
MYO18B	myosin XVIIIIB	Cytoplasm	other
MYO3B	myosin IIIB	Unknown	kinase
MYOD1	myogenic differentiation 1	Nucleus	transcription regulator
N4BP1	NEDD4 binding protein 1	Cytoplasm	other
NAALADL2	N-acetylated alpha-linked acidic dipeptidase-like 2	Unknown	other
NANOS1	nanos homolog 1 (Drosophila)	Cytoplasm	other
NAV1	neuron navigator 1	Unknown	enzyme
NAV2	neuron navigator 2	Nucleus	other
NAV3	neuron navigator 3	Unknown	other
NCK1	NCK adaptor protein 1	Cytoplasm	kinase
NCOR2	nuclear receptor co-repressor 2	Nucleus	transcription regulator
C20orf19	non-protein coding RNA 153	Unknown	other
NDFIP2	Nedd4 family interacting protein 2	Cytoplasm	other
NDUFA4	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 4, 9kDa	Cytoplasm	enzyme
NEBL	nebulette	Cytoplasm	other
NEDD1	neural precursor cell expressed, developmentally down-regulated 1	Cytoplasm	other
NEDD4L	neural precursor cell expressed, developmentally down-regulated 4-like	Cytoplasm	enzyme
NEK7	NIMA (never in mitosis gene a)-related kinase 7	Nucleus	kinase
NELL1	NEL-like 1 (chicken)	Extracellular Space	growth factor
NETO1	neuropilin (NRP) and tolloid (TLL)-like 1	Extracellular Space	other
NEURL2	neuralized homolog 2 (Drosophila)	Cytoplasm	other
NFATC4	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 4	Nucleus	transcription regulator
NFE2L3	nuclear factor (erythroid-derived 2)-like 3	Nucleus	transcription regulator
NFIA	nuclear factor I/A	Nucleus	transcription regulator
NFIB	nuclear factor I/B	Nucleus	transcription regulator
NFKBIZ	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, zeta	Nucleus	transcription regulator
NHEJ1	nonhomologous end-joining factor 1	Nucleus	other
NHLH1	nescient helix loop helix 1	Nucleus	other
NHS	Nance-Horan syndrome (congenital cataracts and dental anomalies)	Nucleus	other
NINJ2	ninjurin 2	Plasma Membrane	other
NLGN1	neuroligin 1	Plasma Membrane	enzyme
NLGN4X			

NLRP1	NLR family, pyrin domain containing 1	Cytoplasm	other
NMBR	neuromedin B receptor	Plasma Membrane	G-protein coupled receptor
NOG	noggin	Extracellular Space	other
NOSIP	nitric oxide synthase interacting protein	Cytoplasm	other
NOSTRIN	nitric oxide synthase trafficker	Cytoplasm	transcription regulator
NPTX2	neuronal pentraxin II	Extracellular Space	other
NR2F1	nuclear receptor subfamily 2, group F, member 1	Nucleus	ligand-dependent nuclear receptor
NR2F2	nuclear receptor subfamily 2, group F, member 2	Nucleus	ligand-dependent nuclear receptor
NR4A2	nuclear receptor subfamily 4, group A, member 2	Nucleus	ligand-dependent nuclear receptor
NR5A2	nuclear receptor subfamily 5, group A, member 2	Nucleus	ligand-dependent nuclear receptor
NRG1	neuregulin 1	Extracellular Space	growth factor
NRK	Nik related kinase	Unknown	kinase
NRP2	neuropilin 2	Plasma Membrane	kinase
NSMCE4A	non-SMC element 4 homolog A (S. cerevisiae)	Nucleus	other
NSUN3	NOL1/NOP2/Sun domain family, member 3	Unknown	other
NT5C2	5'-nucleotidase, cytosolic II	Cytoplasm	phosphatase
NTF3	neurotrophin 3	Extracellular Space	growth factor
NTSR1	neurotensin receptor 1 (high affinity)	Plasma Membrane	G-protein coupled receptor
NUDT12	nudix (nucleoside diphosphate linked moiety X)-type motif 12	Cytoplasm	phosphatase
NUP160	nucleoporin 160kDa	Nucleus	transporter
NUP210	nucleoporin 210kDa	Nucleus	transporter
NUP35	nucleoporin 35kDa	Nucleus	transporter
NXP1	neurexophilin 1	Extracellular Space	other
ODF4	outer dense fiber of sperm tails 4	Unknown	other
ODZ2	odz, odd Oz/ten-m homolog 2 (Drosophila)	Plasma Membrane	other
ODZ3	odz, odd Oz/ten-m homolog 3 (Drosophila)	Plasma Membrane	other
ODZ4	odz, odd Oz/ten-m homolog 4 (Drosophila)	Unknown	other
OFCC1	orofacial cleft 1 candidate 1	Unknown	other
OLIG1	oligodendrocyte transcription factor 1	Nucleus	transcription regulator
OPCML	opioid binding protein/cell adhesion molecule-like	Plasma Membrane	transmembrane receptor
OPRM1	opioid receptor, mu 1	Plasma Membrane	G-protein coupled receptor
OR10W1	olfactory receptor, family 10, subfamily W, member 1	Plasma Membrane	G-protein coupled receptor
OR1C1	olfactory receptor, family 1, subfamily C, member 1	Plasma Membrane	G-protein coupled receptor
OR5K2	olfactory receptor, family 5, subfamily K, member 2	Plasma Membrane	G-protein coupled receptor
ORC2L	origin recognition complex, subunit 2-like (yeast)	Nucleus	other
OSBPL2	oxysterol binding protein-like 2	Cytoplasm	other
OSTN	osteocrin	Extracellular Space	other
OTP	orthopedia homeobox	Nucleus	transcription regulator
OTUD7A	OTU domain containing 7A	Cytoplasm	other
P2RX6	purinergic receptor P2X, ligand-gated ion channel, 6	Plasma Membrane	ion channel
P2RY1	purinergic receptor P2Y, G-protein coupled, 1	Plasma Membrane	G-protein coupled receptor
PACRG	PARK2 co-regulated	Cytoplasm	other
PALMD	palmdelphin	Unknown	other
PAPD1	PAP associated domain containing 1	Unknown	other
PARD3	par-3 partitioning defective 3 homolog (C. elegans)	Plasma Membrane	other
PARD3B	par-3 partitioning defective 3 homolog B (C. elegans)	Plasma Membrane	other
PARN	poly(A)-specific ribonuclease (deadenylation nuclease)	Nucleus	enzyme
PBK	PDZ binding kinase	Cytoplasm	kinase
PCDH10	protocadherin 10	Plasma Membrane	other
PCDH15	protocadherin 15	Plasma Membrane	other
PCDH17	protocadherin 17	Unknown	other
PCDH20	protocadherin 20	Unknown	other
PCDH7	protocadherin 7	Plasma Membrane	other
PCDHB14	protocadherin beta 14	Plasma Membrane	other
PCGF5	polycomb group ring finger 5	Unknown	other
PCNX	pecanex homolog (Drosophila)	Plasma Membrane	other
PCSK2	proprotein convertase subtilisin/kexin type 2	Extracellular Space	peptidase
PCSK6	proprotein convertase subtilisin/kexin type 6	Extracellular Space	peptidase
PDCD6IP	programmed cell death 6 interacting protein	Cytoplasm	other
PDE10A	phosphodiesterase 10A	Cytoplasm	enzyme
PDE1A	phosphodiesterase 1A, calmodulin-dependent	Cytoplasm	enzyme
PDE3A	phosphodiesterase 3A, cGMP-inhibited	Cytoplasm	enzyme
PDE4D	phosphodiesterase 4D, cAMP-specific (phosphodiesterase E3 dunce homolog, Drosophila)	Cytoplasm	enzyme
PDE4DIP	phosphodiesterase 4D interacting protein	Cytoplasm	enzyme
PDE5A	phosphodiesterase 5A, cGMP-specific	Cytoplasm	enzyme
PDGFC	platelet derived growth factor C	Extracellular Space	growth factor
PDZRN3	PDZ domain containing ring finger 3	Extracellular Space	other
PECI	peroxisomal D3,D2-enoyl-CoA isomerase	Cytoplasm	enzyme

PELO	pelota homolog (Drosophila)	Nucleus	other
PEMT	phosphatidylethanolamine N-methyltransferase	Cytoplasm	enzyme
PEX5L	peroxisomal biogenesis factor 5-like	Cytoplasm	other
PFN2	profilin 2	Cytoplasm	other
PFTK1	PFTAIRE protein kinase 1	Nucleus	kinase
PHCA	alkaline ceramidase 3	Cytoplasm	enzyme
PHF17	PHD finger protein 17	Nucleus	other
PICALM	phosphatidylinositol binding clathrin assembly protein	Cytoplasm	other
PID1	phosphotyrosine interaction domain containing 1	Unknown	other
PIK3R1	phosphoinositide-3-kinase, regulatory subunit 1 (alpha)	Cytoplasm	kinase
PIM1	pim-1 oncogene	Cytoplasm	kinase
PIPOX	pipecolic acid oxidase	Cytoplasm	enzyme
PITPNM3	PITPNM family member 3	Cytoplasm	transporter
PITX2	paired-like homeodomain 2	Nucleus	transcription regulator
PIWIL4	piwi-like 4 (Drosophila)	Unknown	other
PKD1L2	polycystic kidney disease 1-like 2	Unknown	ion channel
PKHD1	polycystic kidney and hepatic disease 1 (autosomal recessive)	Plasma Membrane	other
PKN2	protein kinase N2	Cytoplasm	kinase
PKP1	plakophilin 1 (ectodermal dysplasia/skin fragility syndrome)	Plasma Membrane	other
PKP4	plakophilin 4	Plasma Membrane	other
PLAT	plasminogen activator, tissue	Extracellular Space	peptidase
PLCL1	phospholipase C-like 1	Cytoplasm	enzyme
PLCXD2	phosphatidylinositol-specific phospholipase C, X domain containing 2	Unknown	enzyme
PLD5	phospholipase D family, member 5	Unknown	other
PLK2	polo-like kinase 2 (Drosophila)	Nucleus	kinase
PLXDC1	plexin domain containing 1	Plasma Membrane	other
PLXDC2	plexin domain containing 2	Extracellular Space	other
PLXNA2	plexin A2	Plasma Membrane	kinase
PODXL	podocalyxin-like	Plasma Membrane	kinase
POMT2	protein-O-mannosyltransferase 2	Cytoplasm	enzyme
PON1	paraoxonase 1	Extracellular Space	phosphatase
POT1	POT1 protection of telomeres 1 homolog (S. pombe)	Nucleus	other
A26B1	POTE ankyrin domain family, member B	Unknown	other
POU1F1	POU class 1 homeobox 1	Nucleus	transcription regulator
POU3F1	POU class 3 homeobox 1	Nucleus	transcription regulator
POU3F3	POU class 3 homeobox 3	Nucleus	transcription regulator
POU4F1	POU class 4 homeobox 1	Nucleus	transcription regulator
PPARA	peroxisome proliferator-activated receptor alpha	Nucleus	ligand-dependent nuclear receptor
PPARG	peroxisome proliferator-activated receptor gamma	Nucleus	ligand-dependent nuclear receptor
PPARGC1A	peroxisome proliferator-activated receptor gamma, coactivator 1 alpha	Nucleus	transcription regulator
PPCDC	phosphopantothenoylcysteine decarboxylase	Unknown	enzyme
PPFIA2	protein tyrosine phosphatase, receptor type, f polypeptide (PTPRF), interacting protein (liprin), alpha 2	Plasma Membrane	phosphatase
PPHLN1	periphilin 1	Nucleus	other
PPIAL4	peptidylprolyl isomerase A (cyclophilin A)-like 4A	Unknown	other
PPM1H	protein phosphatase 1H (PP2C domain containing)	Unknown	phosphatase
PPM2C	protein phosphatase 2C, magnesium-dependent, catalytic subunit	Cytoplasm	phosphatase
PPP1R16B	protein phosphatase 1, regulatory (inhibitor) subunit 16B	Plasma Membrane	phosphatase
PPP1R3B	protein phosphatase 1, regulatory (inhibitor) subunit 3B	Unknown	other
PPP1R9A	protein phosphatase 1, regulatory (inhibitor) subunit 9A	Cytoplasm	other
PRDM12	PR domain containing 12	Nucleus	other
PREX1	phosphatidylinositol-3,4,5-trisphosphate-dependent Rac exchange factor 1	Cytoplasm	other
PRICKLE2	prickle homolog 2 (Drosophila)	Nucleus	other
PRIM2	primase, DNA, polypeptide 2 (58kDa)	Nucleus	enzyme
PRKAG2	protein kinase, AMP-activated, gamma 2 non-catalytic subunit	Unknown	kinase
PRKCA	protein kinase C, alpha	Cytoplasm	kinase
PRKDCBP	protein kinase C, delta binding protein	Cytoplasm	other
PRKCE	protein kinase C, epsilon	Cytoplasm	kinase
PRKG1	protein kinase, cGMP-dependent, type I	Cytoplasm	kinase
PRKRIR	protein-kinase, interferon-inducible double stranded RNA dependent inhibitor, repressor of (P58 repressor)	Nucleus	other
PRKX	protein kinase, X-linked	Cytoplasm	kinase
PROX1	prospero homeobox 1	Nucleus	transcription regulator
PRR5	proline rich 5 (renal)	Unknown	other
PRRX1	paired related homeobox 1	Nucleus	transcription regulator
PRSS23	protease, serine, 23	Extracellular Space	peptidase
PRSS7	protease, serine, 7 (enterokinase)	Extracellular Space	peptidase
PRUNE2	prune homolog 2 (Drosophila)	Unknown	other
PSD4	pleckstrin and Sec7 domain containing 4	Unknown	other
PSMB7	proteasome (prosome, macropain) subunit, beta type, 7	Cytoplasm	peptidase

PSMD1	proteasome (prosome, macropain) 26S subunit, non-ATPase, 1	Cytoplasm	other
PSME4	proteasome (prosome, macropain) activator subunit 4	Unknown	other
PSMG3	proteasome (prosome, macropain) assembly chaperone 3	Unknown	other
PTCD2	pentatricopeptide repeat domain 2	Unknown	other
PTGFRN	prostaglandin F2 receptor negative regulator	Plasma Membrane	other
PTGIS	prostaglandin I2 (prostacyclin) synthase	Cytoplasm	enzyme
PTHLH	parathyroid hormone-like hormone	Extracellular Space	other
PTPRD	protein tyrosine phosphatase, receptor type, D	Plasma Membrane	phosphatase
PTPRR	protein tyrosine phosphatase, receptor type, R	Plasma Membrane	phosphatase
PTPRT	protein tyrosine phosphatase, receptor type, T	Plasma Membrane	phosphatase
PTS	6-pyruvoyltetrahydropterin synthase	Cytoplasm	enzyme
PVRL1	poliovirus receptor-related 1 (herpesvirus entry mediator C)	Plasma Membrane	other
PXDN	peroxidasin homolog (Drosophila)	Unknown	other
PXDNL	peroxidasin homolog (Drosophila)-like	Unknown	enzyme
QKI	quaking homolog, KH domain RNA binding (mouse)	Nucleus	other
QSOX1	quiescin Q6 sulfhydryl oxidase 1	Cytoplasm	enzyme
RAB30	RAB30, member RAS oncogene family	Cytoplasm	enzyme
RAB38	RAB38, member RAS oncogene family	Cytoplasm	enzyme
RAB3IP	RAB3A interacting protein (rabin3)	Cytoplasm	other
RAD18	RAD18 homolog (S. cerevisiae)	Nucleus	other
RAD51L1	RAD51-like 1 (S. cerevisiae)	Nucleus	enzyme
RALYL	RALY RNA binding protein-like	Unknown	other
RAPGEF1	Rap guanine nucleotide exchange factor (GEF) 1	Cytoplasm	other
RASA1	RAS p21 protein activator (GTPase activating protein) 1	Cytoplasm	transporter
RASA3	RAS p21 protein activator 3	Plasma Membrane	other
RASAL2	RAS protein activator like 2	Unknown	other
RASSF4	Ras association (RalGDS/AF-6) domain family member 4	Unknown	other
RBMS3	RNA binding motif, single stranded interacting protein	Unknown	other
RBP2	retinol binding protein 2, cellular	Cytoplasm	transporter
RCHY1	ring finger and CHY zinc finger domain containing 1	Nucleus	enzyme
RCSD1	RCSD domain containing 1	Unknown	other
RDX	radixin	Cytoplasm	other
RELN	reelin	Extracellular Space	peptidase
REPS1	RALBP1 associated Eps domain containing 1	Unknown	other
RERGL	REERG/RAS-like	Unknown	other
REV1	REV1 homolog (S. cerevisiae)	Nucleus	enzyme
RFXDC1	regulatory factor X, 6	Unknown	enzyme
RGMA	RGM domain family, member A	Plasma Membrane	other
RGMB	RGM domain family, member B	Plasma Membrane	other
RGS21	regulator of G-protein signaling 21	Unknown	other
RGS3	regulator of G-protein signaling 3	Nucleus	other
RGS9	regulator of G-protein signaling 9	Cytoplasm	enzyme
RHBDD1	rhomboid domain containing 1	Extracellular Space	other
RHOBTB1	Rho-related BTB domain containing 1	Unknown	enzyme
RNF112	ring finger protein 112	Nucleus	transcription regulator
RNF144A	ring finger protein 144A	Nucleus	other
RNF150	ring finger protein 150	Unknown	peptidase
RNF213	ring finger protein 213	Unknown	other
RNF216	ring finger protein 216	Cytoplasm	other
RNF220	ring finger protein 220	Unknown	other
ROBO1	roundabout, axon guidance receptor, homolog 1 (Drosophila)	Plasma Membrane	transmembrane receptor
ROBO2	roundabout, axon guidance receptor, homolog 2 (Drosophila)	Plasma Membrane	transmembrane receptor
RORA	RAR-related orphan receptor A	Nucleus	ligand-dependent nuclear receptor
RPL10L	ribosomal protein L10-like	Nucleus	other
RPRM	reprimin, TP53 dependent G2 arrest mediator candidate	Cytoplasm	other
RPS12	ribosomal protein S12	Cytoplasm	other
RPS6KA3	ribosomal protein S6 kinase, 90kDa, polypeptide 3	Cytoplasm	kinase
RRAGC	Ras-related GTP binding C	Cytoplasm	enzyme
RSU1	Ras suppressor protein 1	Cytoplasm	other
RTP4	receptor (chemosensory) transporter protein 4	Plasma Membrane	other
RUFY2	RUN and FYVE domain containing 2	Unknown	other
RUNDC2A	RUN domain containing 2A	Unknown	other
RUNX1	runt-related transcription factor 1	Nucleus	transcription regulator
RUNX1T1	runt-related transcription factor 1; translocated to, 1 (cyclin D-related)	Nucleus	transcription regulator
RUNX2	runt-related transcription factor 2	Nucleus	transcription regulator
RXFP2	relaxin/insulin-like family peptide receptor 2	Plasma Membrane	G-protein coupled receptor
RXRG	retinoid X receptor, gamma	Nucleus	ligand-dependent nuclear receptor
RYR3	ryanodine receptor 3	Plasma Membrane	ion channel
SASH1	SAM and SH3 domain containing 1	Unknown	other
SATB2	SATB homeobox 2	Nucleus	transcription regulator
SCARA5	scavenger receptor class A, member 5 (putative)	Cytoplasm	other

SCARB1	scavenger receptor class B, member 1	Plasma Membrane	transporter
SCFD2	sec1 family domain containing 2	Unknown	transporter
SCG2	secretogranin II (chromogranin C)	Extracellular Space	cytokine
SCIN	scinderin	Cytoplasm	other
SDC3	syndecan 3	Plasma Membrane	other
SEC24D	SEC24 family, member D (<i>S. cerevisiae</i>)	Cytoplasm	transporter
SEL1L	sel-1 suppressor of lin-12-like (<i>C. elegans</i>)	Cytoplasm	other
SEMA3C	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3C	Extracellular Space	other
SEMA3D	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3D	Extracellular Space	other
SEMA6A	sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6A	Plasma Membrane	other
SEPP1	selenoprotein P, plasma, 1	Extracellular Space	other
SEPSECS	Sep (O-phosphoserine) tRNA:Sec (selenocysteine) tRNA synthase	Cytoplasm	other
SETBP1	SET binding protein 1	Nucleus	other
SETD7	SET domain containing (lysine methyltransferase) 7	Nucleus	enzyme
SGMS1	sphingomyelin synthase 1	Cytoplasm	enzyme
SGOL1	shugoshin-like 1 (<i>S. pombe</i>)	Nucleus	other
SGPP2	sphingosine-1-phosphate phosphatase 2	Cytoplasm	phosphatase
SGTA	small glutamine-rich tetratricopeptide repeat (TPR)-containing, alpha	Cytoplasm	other
SH3GLB1	SH3-domain GRB2-like endophilin B1	Cytoplasm	enzyme
SH3PXD2B	SH3 and PX domains 2B	Unknown	other
SHB	Src homology 2 domain containing adaptor protein B	Unknown	other
SHCBP1	SHC SH2-domain binding protein 1	Unknown	other
SHROOM4	shroom family member 4	Unknown	other
SIPA1L1	signal-induced proliferation-associated 1 like 1	Cytoplasm	other
SLC10A2	solute carrier family 10 (sodium/bile acid cotransporter family), member 2	Plasma Membrane	transporter
SLC10A7	solute carrier family 10 (sodium/bile acid cotransporter family), member 7	Unknown	transporter
SLC16A10	solute carrier family 16, member 10 (aromatic amino acid transporter)	Plasma Membrane	transporter
SLC16A2	solute carrier family 16, member 2 (monocarboxylic acid transporter 8)	Plasma Membrane	transporter
SLC24A3	solute carrier family 24 (sodium/potassium/calcium exchanger), member 3	Plasma Membrane	transporter
SLC25A26	solute carrier family 25, member 26	Unknown	other
SLC25A28	solute carrier family 25, member 28	Unknown	other
SLC26A7	solute carrier family 26, member 7	Plasma Membrane	transporter
SLC27A2	solute carrier family 27 (fatty acid transporter), member 2	Cytoplasm	transporter
SLC27A6	solute carrier family 27 (fatty acid transporter), member 6	Plasma Membrane	transporter
SLC35B3	solute carrier family 35, member B3	Cytoplasm	other
SLC35F1	solute carrier family 35, member F1	Unknown	other
SLC38A1	solute carrier family 38, member 1	Plasma Membrane	transporter
SLC38A11	solute carrier family 38, member 11	Unknown	transporter
SLC38A9	solute carrier family 38, member 9	Unknown	other
SLC45A1	solute carrier family 45, member 1	Unknown	transporter
SLC46A3	solute carrier family 46, member 3	Extracellular Space	other
SLC4A10	solute carrier family 4, sodium bicarbonate transporter, member 10	Unknown	transporter
SLC6A15	solute carrier family 6 (neutral amino acid transporter), member 15	Plasma Membrane	transporter
SLC7A7	solute carrier family 7 (cationic amino acid transporter, y+ system), member 7	Plasma Membrane	transporter
SLCO4C1	solute carrier organic anion transporter family, member 4C1	Unknown	transporter
SLITRK5	SLIT and NTRK-like family, member 5	Unknown	other
SMARCA2	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily a, member 2	Nucleus	transcription regulator
SMC3	structural maintenance of chromosomes 3	Nucleus	other
SNN	stannin	Plasma Membrane	other
WDR57	small nuclear ribonucleoprotein 40kDa (U5)	Nucleus	other
SNTG1	syntrophin, gamma 1	Nucleus	other
SNX18	sorting nexin 18	Cytoplasm	transporter
SORCS1	sortilin-related VPS10 domain containing receptor 1	Plasma Membrane	transporter
SOX14	SRY (sex determining region Y)-box 14	Nucleus	transcription regulator
SOX5	SRY (sex determining region Y)-box 5	Nucleus	transcription regulator
SOX6	SRY (sex determining region Y)-box 6	Nucleus	transcription regulator
SP8	Sp8 transcription factor	Nucleus	other
SPAG17	sperm associated antigen 17	Unknown	other
SPAG6	sperm associated antigen 6	Cytoplasm	other
SPANXN2	SPANX family, member N2	Unknown	other
SPCS3	signal peptidase complex subunit 3 homolog (<i>S. cerevisiae</i>)	Cytoplasm	peptidase
SPHKAP	SPHK1 interactor, AKAP domain containing	Unknown	other
SPINT2	serine peptidase inhibitor, Kunitz type, 2	Extracellular Space	other
SPN	sialophorin	Plasma Membrane	transmembrane receptor
SPP2	secreted phosphoprotein 2, 24kDa	Extracellular Space	other
SPRED2	sprouty-related, EVH1 domain containing 2	Extracellular Space	cytokine
SPRR2B	small proline-rich protein 2B	Cytoplasm	other

SPRY1	sprouty homolog 1, antagonist of FGF signaling (Drosophila)	Plasma Membrane	other
SSH8	synovial sarcoma translocation, chromosome 18	Nucleus	other
SSH2	slingshot homolog 2 (Drosophila)	Cytoplasm	phosphatase
SSTR1	somatostatin receptor 1	Plasma Membrane	G-protein coupled receptor
ST6GAL2	ST6 beta-galactosamide alpha-2,6-sialyltransferase 2	Cytoplasm	enzyme
ST6GALNAC5	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgalactosaminide alpha-2,6-sialyltransferase 5	Cytoplasm	enzyme
ST8SIA1	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 1	Cytoplasm	enzyme
STAG1	stromal antigen 1	Nucleus	other
STAG3L4	stromal antigen 3-like 4	Unknown	other
STARD13	StAR-related lipid transfer (START) domain containing 13	Cytoplasm	other
STC2	stanniocalcin 2	Extracellular Space	other
STIM2	stromal interaction molecule 2	Plasma Membrane	other
STK24	serine/threonine kinase 24 (STE20 homolog, yeast)	Cytoplasm	kinase
STK32A	serine/threonine kinase 32A	Unknown	kinase
STK32B	serine/threonine kinase 32B	Unknown	kinase
STX11	syntaxin 11	Plasma Membrane	transporter
STX16	syntaxin 16	Cytoplasm	transporter
STXBP6	syntaxin binding protein 6 (amisyn)	Cytoplasm	other
SUCLG2	succinate-CoA ligase, GDP-forming, beta subunit	Cytoplasm	enzyme
SUDS3	suppressor of defective silencing 3 homolog (S. cerevisiae)	Nucleus	other
SULF1	sulfatase 1	Cytoplasm	enzyme
SULF2	sulfatase 2	Extracellular Space	enzyme
SUMF1	sulfatase modifying factor 1	Cytoplasm	other
SUPT3H	suppressor of Ty 3 homolog (S. cerevisiae)	Nucleus	transcription regulator
SVIL	supervillin	Plasma Membrane	other
SYDE2	synapse defective 1, Rho GTPase, homolog 2 (C. elegans)	Unknown	other
SYN3	synapsin III	Plasma Membrane	other
DMN	synemin, intermediate filament protein	Cytoplasm	other
SYT2	synaptotagmin II	Cytoplasm	transporter
SYT7	synaptotagmin VII	Cytoplasm	transporter
TAF8	TAF8 RNA polymerase II, TATA box binding protein (TBP)-associated factor, 43kDa	Nucleus	transcription regulator
TANK	TRAF family member-associated NFkB activator	Cytoplasm	other
TBC1D19	TBC1 domain family, member 19	Unknown	other
TBC1D22A	TBC1 domain family, member 22A	Unknown	other
TBC1D23	TBC1 domain family, member 23	Unknown	other
TBC1D2B	TBC1 domain family, member 2B	Unknown	other
TBCD	tubulin folding cofactor D	Cytoplasm	other
TBL1XR1	transducin (beta)-like 1 X-linked receptor 1	Nucleus	transcription regulator
TCERG1L	transcription elongation regulator 1-like	Unknown	other
TCF7L2	transcription factor 7-like 2 (T-cell specific, HMG-box)	Nucleus	transcription regulator
TCHH	trichohyalin	Unknown	other
TEKT3	tektin 3	Unknown	other
TES	testis derived transcript (3 LIM domains)	Plasma Membrane	other
TEX13A	testis expressed 13A	Unknown	other
TFCP2	transcription factor CP2	Nucleus	transcription regulator
TGFB2	transforming growth factor, beta 2	Extracellular Space	growth factor
TGFBR3	transforming growth factor, beta receptor III	Plasma Membrane	kinase
TGIF1	TGFB-induced factor homeobox 1	Nucleus	transcription regulator
THBS2	thrombospondin 2	Extracellular Space	other
THG1L	tRNA-histidine guanylyltransferase 1-like (S. cerevisiae)	Cytoplasm	enzyme
THSD4	thrombospondin, type I, domain containing 4	Unknown	other
THSD7A	thrombospondin, type I, domain containing 7A	Unknown	other
TLE1	transducin-like enhancer of split 1 (E(sp1) homolog, Drosophila)	Nucleus	transcription regulator
TLE3	transducin-like enhancer of split 3 (E(sp1) homolog, Drosophila)	Nucleus	other
TLE6	transducin-like enhancer of split 6 (E(sp1) homolog, Drosophila)	Nucleus	other
TLN2	talin 2	Nucleus	other
TLR4	toll-like receptor 4	Plasma Membrane	transmembrane receptor
TLX3	T-cell leukemia homeobox 3	Nucleus	transcription regulator
TMC1	transmembrane channel-like 1	Plasma Membrane	other
TMC3	transmembrane channel-like 3	Unknown	other
TMCO4	transmembrane and coiled-coil domains 4	Unknown	other
TMEFF2	transmembrane protein with EGF-like and two follistatin-like domains 2	Plasma Membrane	other
TMEM123	transmembrane protein 123	Plasma Membrane	other
TMEM131	transmembrane protein 131	Unknown	other
TMEM132D	transmembrane protein 132D	Unknown	other
TMEM133	transmembrane protein 133	Unknown	other
TMEM18	transmembrane protein 18	Unknown	other
TMEM5	transmembrane protein 5	Plasma Membrane	other
TMEM61	transmembrane protein 61	Unknown	other
TMEM74	transmembrane protein 74	Unknown	other

TMTC1	transmembrane and tetratricopeptide repeat containing 1	Unknown	other
TNFAIP3	tumor necrosis factor, alpha-induced protein 3	Nucleus	other
TNFSF15	tumor necrosis factor (ligand) superfamily, member 15	Extracellular Space	cytokine
TNRC18	trinucleotide repeat containing 18	Unknown	other
TNS3	tensin 3	Unknown	phosphatase
TOE1	target of EGR1, member 1 (nuclear)	Nucleus	other
TOM1	target of myb1 (chicken)	Cytoplasm	transporter
TOM1L1	target of myb1 (chicken)-like 1	Cytoplasm	other
TOMM7	translocase of outer mitochondrial membrane 7 homolog (yeast)	Cytoplasm	transporter
TOX	thymocyte selection-associated high mobility group box	Nucleus	other
TOX2	TOX high mobility group box family member 2	Nucleus	transcription regulator
TOX3	TOX high mobility group box family member 3	Unknown	other
TPK1	thiamin pyrophosphokinase 1	Cytoplasm	kinase
TRAK2	trafficking protein, kinesin binding 2	Plasma Membrane	transporter
TRAM2	translocation associated membrane protein 2	Unknown	other
TREM2	triggering receptor expressed on myeloid cells 2	Plasma Membrane	transmembrane receptor
TRIM33	tripartite motif-containing 33	Nucleus	transcription regulator
TRIML1	tripartite motif family-like 1	Unknown	other
TRIO	triple functional domain (PTPRF interacting)	Plasma Membrane	kinase
TRPC4	transient receptor potential cation channel, subfamily C, member 4	Plasma Membrane	ion channel
TRPM3	transient receptor potential cation channel, subfamily M, member 3	Plasma Membrane	ion channel
TSC22D2	TSC22 domain family, member 2	Unknown	other
TSHZ3	teashirt zinc finger homeobox 3	Nucleus	transcription regulator
TSPAN16	tetraspanin 16	Unknown	other
TTN	titin	Cytoplasm	peptidase
TXNIP	thioredoxin interacting protein	Cytoplasm	other
UACA	uveal autoantigen with coiled-coil domains and ankyrin repeats	Cytoplasm	other
UBC	ubiquitin C	Cytoplasm	other
UBE2E2	ubiquitin-conjugating enzyme E2E 2 (UBC4/5 homolog, yeast)	Cytoplasm	enzyme
UBE2G2	ubiquitin-conjugating enzyme E2G 2 (UBC7 homolog, yeast)	Cytoplasm	enzyme
UBL7	ubiquitin-like 7 (bone marrow stromal cell-derived)	Unknown	other
UGT2A2	UDP glucuronosyltransferase 2 family, polypeptide A2	Unknown	other
UNC5D	unc-5 homolog D (C. elegans)	Unknown	other
UQCRCFS1	ubiquinol-cytochrome c reductase, Rieske iron-sulfur polypeptide 1	Cytoplasm	enzyme
USP12	ubiquitin specific peptidase 12	Cytoplasm	peptidase
USP29	ubiquitin specific peptidase 29	Unknown	peptidase
USP3	ubiquitin specific peptidase 3	Cytoplasm	peptidase
VAPA	VAMP (vesicle-associated membrane protein)-associated protein A, 33kDa	Plasma Membrane	other
VASH2	vasohibin 2	Unknown	other
VAV3	vav 3 guanine nucleotide exchange factor	Extracellular Space	cytokine
VAX1	ventral anterior homeobox 1	Nucleus	transcription regulator
VCAM1	vascular cell adhesion molecule 1	Plasma Membrane	other
VEGFC	vascular endothelial growth factor C	Extracellular Space	growth factor
VGLL3	vestigial like 3 (Drosophila)	Unknown	other
VLDLR	very low density lipoprotein receptor	Plasma Membrane	transporter
VRK2	vaccinia related kinase 2	Nucleus	kinase
VTCN1	V-set domain containing T cell activation inhibitor 1	Plasma Membrane	other
WARS	tryptophanyl-tRNA synthetase	Cytoplasm	enzyme
WBSCR17	Williams-Beuren syndrome chromosome region 17	Cytoplasm	enzyme
WDR1	WD repeat domain 1	Extracellular Space	other
WDR31	WD repeat domain 31	Unknown	peptidase
WDR44	WD repeat domain 44	Cytoplasm	other
WDR70	WD repeat domain 70	Unknown	other
WEE1	WEE1 homolog (S. pombe)	Nucleus	kinase
WNT5B	wingless-type MMTV integration site family, member 5B	Extracellular Space	other
WSB1	WD repeat and SOCS box-containing 1	Unknown	other
WSCD1	WSC domain containing 1	Unknown	other
WWOX	WW domain containing oxidoreductase	Cytoplasm	enzyme
XCL2	chemokine (C motif) ligand 2	Extracellular Space	cytokine
XRCC4	X-ray repair complementing defective repair in Chinese hamster cells 4	Nucleus	other
XRN1	5'-3' exoribonuclease 1	Cytoplasm	enzyme
ZBTB20	zinc finger and BTB domain containing 20	Nucleus	other
ZC3H15	zinc finger CCCH-type containing 15	Nucleus	other
ZC3H8	zinc finger CCCH-type containing 8	Nucleus	other
ZCCHC6	zinc finger, CCHC domain containing 6	Unknown	other
ZCCHC7	zinc finger, CCHC domain containing 7	Unknown	other
ZDHHC14	zinc finger, DHHC-type containing 14	Unknown	other
ZEB1	zinc finger E-box binding homeobox 1	Nucleus	transcription regulator
ZEB2	zinc finger E-box binding homeobox 2	Nucleus	transcription regulator
ZFHX4	zinc finger homeobox 4	Unknown	other
ZFPM2	zinc finger protein, multitype 2	Nucleus	transcription regulator
ZHX2	zinc fingers and homeoboxes 2	Nucleus	transcription regulator

ZIC1	Zic family member 1 (odd-paired homolog, Drosophila)	Nucleus	transcription regulator
ZMIZ1	zinc finger, MIZ-type containing 1	Nucleus	other
ZMYND8	zinc finger, MYND-type containing 8	Nucleus	transcription regulator
ZNF107	zinc finger protein 107	Nucleus	other
ZNF217	zinc finger protein 217	Nucleus	transcription regulator
ZNF331	zinc finger protein 331	Nucleus	other
ZNF334	zinc finger protein 334	Nucleus	other
ZNF365	zinc finger protein 365	Unknown	other
ZNF385D	zinc finger protein 385D	Nucleus	other
ZNF462	zinc finger protein 462	Nucleus	other
ZNF483	zinc finger protein 483	Nucleus	transcription regulator
ZNF512	zinc finger protein 512	Nucleus	other
ZNF536	zinc finger protein 536	Unknown	other
ZNF555	zinc finger protein 555	Unknown	other
ZNF568	zinc finger protein 568	Unknown	other
ZNF57	zinc finger protein 57	Unknown	other
ZNF608	zinc finger protein 608	Unknown	other
ZNF648	zinc finger protein 648	Unknown	other
ZNF703	zinc finger protein 703	Unknown	other
ZNF704	zinc finger protein 704	Unknown	other
ZNF75D	zinc finger protein 75D	Nucleus	other
ZNF804A	zinc finger protein 804A	Unknown	other
ZNF835	zinc finger protein 835	Unknown	other
ZPLD1	zona pellucida-like domain containing 1	Unknown	other
ZSWIM2	zinc finger, SWIM-type containing 2	Unknown	other

Table S3. Correlation of PAX3-FKHR sites with induced genes in cell lines

Correlation of P3F sites with P3F induced genes in cell lines

	Expression changed with P3F			
	Gonome	Changed	Up	Down
Number of Genes	20139	81	61	20
Genes with P3F sites	1072	24	23	1
P3F sites per gene	5.4%	29.6%	37.7%	5.0%
	Fold of enrichment			
			7.03	0.93

Affymetrix ID	Gene name	Symbol	P3F regulation*
209460_at	4-Aminobutyrate aminotransferase	ABAT	Up
208212_s_at	Anaplastic lymphoma kinase (Ki-1)	ALK	Up
202920_at	Ankyrin 2, neuronal	ANK2	Up
207076_s_at	Argininosuccinate synthetase	ASS	Up
205431_s_at	Bone morphogenetic protein 5	BMP5	Up
201005_at	CD9 antigen (p24)	CD9	Up
211237_s_at	Fibroblast growth factor receptor 4	FGFR4	Up
203725_at	Growth arrest and DNA damage inducible,	GADD45A	Up
202455_at	Histone deacetylase 5	HDAC5	Up
203233_at	Interleukin-4 receptor	IL4R	Up
203510_at	Met proto-oncogene (hepatocyte growth factor receptor)	MET	Up
205330_at	Meningioma (disrupted in balanced translocation) 1	MN1	Up
209757_s_at	V-myc myelocytomatosis viral-related oncogene, neuroblast	MYCN	Up
206657_s_at	Myogenic factor 3	MYOD1	Up
203962_s_at	Nebulette	NEBL	Up
206089_at	NEL-like 1 (chicken)	NELL1	Up
219148_at	PDZ-binding kinase	PBK	Up
201939_at	Polo-like kinase 2 (Drosophila)	PLK2	Down
211341_at	POU domain, class 4, transcription factor 1	POU4F1	Up
213093_at	Protein kinase C	PRKCA	Up
212353_at	Sulfatase 1	SULF1	Up
216511_s_at	Transcription factor 7-like 2 (T-cell-specific, HMG box)	TCF7L2	Up
202643_s_at	Tumor necrosis factor--induced protein 3	TNFAIP3	Up
202369_s_at	Translocation-associated membrane protein 2	TRAM2	Up

* Expression data from Davicioni et al., Cancer Res 66, 6936-6946, 2006

Table S4. Correlation of PAX3-FKHR sites with induced genes in P3F+ tumors

	Expression changed with P3F			
	Gonome	Changed	Up	Down
Number of Genes	20139	485	363	122
Genes with P3F sites	1072	95	88	7
P3F sites per gene	5.4%	19.6%	24.2%	5.7%
			Fold of enrichment	
			4.52	1.07

Affy ID	Gene Name	Symbol	PAX-FKHR regulation**
209459_s_at	4-aminobutyrate aminotransferase	ABAT	Up
209460_at	4-aminobutyrate aminotransferase	ABAT	Up
209869_at	Adrenergic, alpha-2A-, receptor	ADRA2A	Up
206128_at	Adrenergic, alpha-2C-, receptor	ADRA2C	Up
212609_s_at	V-akt murine thymoma viral oncogene	AKT3	Up
208211_s_at	Anaplastic lymphoma kinase (Ki-1)	ALK	Up
208212_s_at	Anaplastic lymphoma kinase (Ki-1)	ALK	Up
202920_at	Ankyrin 2, neuronal	ANK2	Up
212747_at	Ankyrin repeat and sterile alpha motif	ANKS1	Up
205068_s_at	Rho GTPase activating protein 26	ARHGAP26	Up
207076_s_at	Argininosuccinate synthetase	ASS	Up
215407_s_at	Astrotactin 2	ASTN2	Up
219497_s_at	B-cell CLL/lymphoma 11A (zinc finger)	BCL11A	Up
219433_at	BCL6 co-repressor	BCOR	Up
205430_at	Bone morphogenetic protein 5	BMP5	Up
205431_s_at	Bone morphogenetic protein 5	BMP5	Up
203482_at	Chromosome 10 open reading frame 6	C10orf6	Up
203481_at	Chromosome 10 open reading frame 6	C10orf6	Up
212736_at	Chromosome 16 open reading frame 45	C16orf45	Up
204726_at	Cadherin 13, H-cadherin (heart)	CDH13	Up
203256_at	Cadherin 3, type 1, P-cadherin (placental)	CDH3	Up
203098_at	Chromodomain protein, Y-like	CDYL	Up
218829_s_at	Chromodomain helicase DNA binding	CHD7	Up
201256_at	Cytochrome c oxidase subunit VIIa	COX7A2L	Up
201940_at	Carboxypeptidase D	CPD	Up
201941_at	Carboxypeptidase D	CPD	Up
212905_at	Cleavage stimulation factor, 3' pre-RNA,	CSTF2T	Up
212901_s_at	Cleavage stimulation factor, 3' pre-RNA,	CSTF2T	Up
202157_s_at	CUG triplet repeat, RNA binding protein 2	CUGBP2	Up
202156_s_at	CUG triplet repeat, RNA binding protein 2	CUGBP2	Up
203139_at	Death-associated protein kinase 1	DAPK1	Up
201623_s_at	Aspartyl-tRNA synthetase	DARS	Up
201624_at	Aspartyl-tRNA synthetase	DARS	Up
202534_x_at	Dihydrofolate reductase	DHFR	Up
48808_at	Dihydrofolate reductase	DHFR	Up
202532_s_at	Dihydrofolate reductase	DHFR	Up
212254_s_at	Dystonin	DST	Up
215016_x_at	Dystonin	DST	Up
204513_s_at	Engulfment and cell motility 1 (ced-12)	ELMO1	Up
209692_at	Eyes absent homolog 2 (Drosophila)	EYA2	Up
203638_s_at	Fibroblast growth factor receptor 2	FGFR2	Up

208228_s_at	Fibroblast growth factor receptor 2	FGFR2	Up
204579_at	Fibroblast growth factor receptor 4	FGFR4	Up
211237_s_at	Fibroblast growth factor receptor 4	FGFR4	Up
205935_at	Forkhead box F1	FOXF1	Up
202724_s_at	Forkhead box O1A (rhabdomyosarcoma)	FOXO1A	Up
204121_at	Growth arrest and DNA-damage-	GADD45G	Up
200708_at	Glutamic-oxaloacetic transaminase 2,	GOT2	Up
202455_at	Histone deacetylase 5	HDAC5	Up
221185_s_at	IQ motif containing G	IQCG	Up
214961_at	KIAA0774	KIAA0774	Up
218364_at	Leucine rich repeat (in FLII) interacting	LRRFIP2	Up
206853_s_at	Mitogen-activated protein kinase kinase	MAP3K7	Up
205619_s_at	Mesenchyme homeo box 1	MEOX1	Up
203510_at	Met proto-oncogene (hepatocyte growth	MET	Up
209757_s_at	V-myc myelocytomatosis viral related	MYCN	Up
206657_s_at	Myogenic factor 3	MYOD1	Up
206089_at	NEL-like 1 (chicken)	NELL1	Up
214628_at	Nescient helix loop helix 1	NHLH1	Up
221933_at	Neurologin 4, X-linked	NLGN4X	Up
219148_at	PDZ binding kinase	PBK	Up
212915_at	PDZ domain containing RING finger 3	PDZRN3	Up
218025_s_at	Peroxisomal D3,D2-enoyl-CoA isomerase	PECI	Up
204604_at	PFTAIRE protein kinase 1	PFTK1	Up
221605_s_at	Pipecolic acid oxidase	PIPOX	Up
221854_at	Plakophilin 1 (ectodermal dysplasia/skin	PKP1	Up
211341_at	POU domain, class 4, transcription factor	POU4F1	Up
206940_s_at	POU domain, class 4, transcription factor	POU4F1	Up
212686_at	Protein phosphatase 1H (PP2C domain	PPM1H	Up
213362_at	Protein tyrosine phosphatase, receptor	PTPRD	Up
214043_at	Protein tyrosine phosphatase, receptor	PTPRD	Up
205712_at	Protein tyrosine phosphatase, receptor	PTPRD	Up
205948_at	Protein tyrosine phosphatase, receptor	PTPRT	Up
49306_at	Ras association (RalGDS/AF-6) domain	RASSF4	Up
221578_at	Ras association (RalGDS/AF-6) domain	RASSF4	Up
206306_at	Ryanodine receptor 3	RYR3	Up
209090_s_at	SH3-domain GRB2-like endophilin B1	SH3GLB1	Up
57588_at	Solute carrier family 24	SLC24A3	Up
219090_at	Solute carrier family 24	SLC24A3	Up
218237_s_at	Solute carrier family 38, member 1	SLC38A1	Up
210715_s_at	Serine protease inhibitor, Kunitz type, 2	SPINT2	Up
203438_at	Stanniocalcin 2	STC2	Up
202369_s_at	Translocation associated membrane protein	TRAM2	Up
204094_s_at	TSC22 domain family 2	TSC22D2	Up
208195_at	Titin	TTN	Up
220327_at	Vestigial-like 3	VGL-3	Up
200628_s_at	Tryptophanyl-tRNA synthetase	WARS	Up
219077_s_at	WW domain containing oxidoreductase	WWOX	Up
219427_at	FAT tumor suppressor homolog 4	FAT4	Down
206432_at	Hyaluronan synthase 2	HAS2	Down
208025_s_at	High mobility group AT-hook 2	HMGA2	Down
205376_at	Inositol polyphosphate-4-phosphatase,	INPP4B	Down
204823_at	Neuron navigator 3	NAV3	Down
213345_at	Nuclear factor of activated T-cells,	NFATC4	Down
219779_at	Zinc finger homeodomain 4	ZFHX4	Down

** Tumor expression data from Davicioni et al., Am J Path. 174, 550-564, 2009

Table S5. Top enriched transcription factor motifs in PAX3-FKHR binding sites

Motif name	Motif ID	Motifs in genome	Motifs in binding sites	Fold enrichment	p-val
NBase	N/A	3080436051	266169	1.00	1
PAX3_B	M00327	105027	197	21.71	0
AP4_Q6_01	M00927	158883	177	12.89	0
LBP1_Q6	M00644	335418	322	11.11	0
PAX3_01	M00360	207349	98	5.47	1.39E-39
PAX2_01	M00098	206979	96	5.37	3.61E-38
PAX5_02	M00144	213967	93	5.03	6.59E-35
TAL1_Q6	M00993	256174	110	4.97	1.72E-40
AP1_01	M00517	207370	77	4.30	4.68E-25
AP1_C	M00199	315499	117	4.29	4.24E-37
TCF11MAFG_01	M00284	208305	75	4.17	1.11E-23
TAL1ALPHA47_01	M00066	236985	82	4.00	1.18E-24
MYOGENIN_Q6	M00712	193832	64	3.82	1.21E-18
NRF2_Q4	M00821	299546	97	3.75	9.26E-27
RFX_Q6	M00975	163680	53	3.75	2.16E-15
NFE2_01	M00037	286738	76	3.07	1.19E-16
FOXO3_01	M00477	258145	67	3.00	1.84E-14
TAXCREB_02	M00115	280240	71	2.93	9.96E-15
FOXO3A_Q1	M01137	227142	57	2.90	5.46E-12
TEF1_Q6	M00704	899124	218	2.81	7.20E-39
XFD3_01	M00269	244451	56	2.65	2.28E-10
BRN2_01	M00145	237092	51	2.49	1.02E-08
PAX_Q6	M00808	431842	92	2.47	3.39E-14
MYOGNF1_01	M00056	592407	120	2.34	1.89E-16
PAX6_01	M00097	1555087	315	2.34	2.87E-40
ATF6_01	M00483	566927	110	2.25	4.79E-14
HMG1Y_Q6	M00750	381038	72	2.19	2.70E-09
SOX10_Q6	M01131	597079	105	2.04	4.62E-11

Table S6. De novo motif discovery in PAX3-FKHR binding sites with DME

MATRIX	ID	Back-ground	Fore-ground	p-val	Fold of Enrichment	Matching motif via Transfac	<i>E value</i>
WBCAGCTG	DME4	1093598	856	0	9.06	LBP-1_M00644	5.28E-07
ACCRTGAM	DME10	459201	279	0	7.03	Pax-3_M00327	1.76E-06
RCAGCWGM	DME5	854498	710	0	9.62	AP-4_M00927	3.55E-08
RSYGTGAC	DME21	636639	355	0	6.45	Pax-3_M00360	2.25E-09
SHCAGCTG	DME7	1273808	1059	0	9.62	AP-4_M00005	1.59E-07
ATTWGTCA	DME2	204647	231	0	13.06	AP-1_M00188	6.07E-06
AMCAVCTG	DME100	532101	440	0	9.57	MyoD_M00001	9.67E-09
CRTGACYA	DME16	344489	247	0	8.30	AP-1_M00188	4.51E-05
SCRTGACT	DME18	435035	214	0	5.69	Pax-3_M00327	1.25E-05
CRTGAAAT	DME6	365300	202	0	6.40	STE12_M00664	1.75E-05

Table S7. Primers used for PCR and mutagenesis

Primers for enhancer cloning

Gene	Enh	5' primer	Tm	3' primer	Tm	Product size	Location	Tx Start dist	Tx End Dist	Binding site
Vector										
MYOD1	1	TCCAGGATGGGCTCTGTTCTAAT	59.3 °C	ACAGGGAATGAAGATCCGCCATGA	60.1 °C	756	5' upstream	20,088	21,814	chr11:17677736-17677897
FGFR4.1	1	AGTCCGCATTGCACATACACGGT	60.2 °C	GGAGTAGCAGTACGTGCCAGGAT	60.2 °C	425	3' downstream	-8,913	-839	chr5:176458051-176458193
FGFR4.2	2	TGCTGAATGAAGGAAGAGGAGACC	60.0 °C	AGAAGTACAAGGAGCCACAGCAT	60.0 °C	519	3' downstream	-16,273	-8,199	chr5:176465375-176465589
MET.1	1	CCAAAGACAGCTGCCCTACACAAA	59.4 °C	CTTCATCTACATTGACATGGCTCTGC	57.5 °C	408	3rd Intron	-35,329	61,711	chr7:116161626-116161779
MET.2	2	TTGTCCACAGACTTGGCTGCAA	60.6 °C	GCTATGCATCCTCTGTTAAAGCTGGC	59.6 °C	681	18th Intron	-83,277	13,763	chr7:116209579-116209722
IGF1R.3	1	AGTCTAGCCTGCTGTGATTGTGCT	60.1 °C	AAACCTGCACTGAGGTCAACTGGT	60.5 °C	508	2nd Intron	-136,375	171,486	chr15:97146617-97146799
ALK	1	TGCCTGGGTAAGAAGCTAGGGAA	59.6 °C	ACAGGAGAGGAGCAGATGAACACT	59.2 °C	608	3rd Intron	-262,835	464,601	chr2:29734041-29734346
MYCN.2	1	TGAGCACATGTGTGAGAGACCA	60.1 °C	AACTTCAGCAACACGGTACACTGC	59.6 °C	568	3' downstream	-96,819	-92,786	chr2:16096386-16096525
PRRX1	1	TGGCAGAATCGGGTAATCAGGGA	59.9 °C	TCCAGGATGGTGTGCATAAGAA	60.1 °C	601	1st intron	-4,226	67,742	chr1:168903994-168904423
MEOX1	1	TACACACACATGTGGCCAGCTACT	60.0 °C	AGAGTGTGCCTTTCTTTGTAAGTGC	57.2 °C	765	5' upstream	994	20,274	chr17:39094960-39095194
MEOX2	1	GTTCTCTTTCTCCAGTGTGAGC	57.7 °C	TCCAACCTCCAGCTTGGGCT	60.6 °C	822	1 intron	-798	73,218	chr7:15691652-15691856

Primers for site-direct mutagenesis

Enhancer	Forward	Tm	Reverse
MYOD1.2	GAGTGTCTCAGCTTAAAACCCATTTATC ACAGCACAGCCAGTGTGG	75.6°C	CCCACTGGCTGTGCTGTGATAAAT GGGTTTTAAGCTGAGCACTC
FGFR4.2	GTGGTTGAGGAGGGGGCATTTAATCG CCAACAGCTGAAC	76.3°C	GTTTACAGCTGTTGGCGATTAATGCC CCCTCCTCAACCAC
PRRX1	CGCGGAAATCGATTTGTTAAAAGGG AGAGGTGTAACCG	75.1°C	CGTTTACACCTCTCCCTTTTAAACAA ATCGATTTCCCGCG
MEOX2	CCCCAGCGCTGGGATGGAAGATTAG CTTCACATCGATTTCAC	75.7°C	GTGAAATCGATTGTGAAGCTAAATC TTCCATCCCAGCGCTGGGG

Primers for qPCR

Enhancer	Forward	Reverse
MYF5 enhancer	CTGACTCAGTGAACCTTAATGTGTGA	AGCATTCTCCAGTTACCATGCAA
GAPDH promoter	TACTAGCGGTTTTACGGGCGCA	AACAGGAGGAGCAGAGAGCGAA
cDNA	Forward	Reverse
PAX3-FKHR	GCA CTG TAC ACC AAA GCA CG	CAG TTC CTT CAT TCT GCA CAC
ALK	CTTCCAGATCTTCGGGACTG	TGCGATGAGACAGGAAAGG
FGFR4	TGACCAAGCCAGCACTGTG	TGATGTTCTTGTGTGGCCG
PRRX1	GATGAGAACGTGGGCGAG	TTGTCTATTCTTCCGCTGC
MEOX1	GAGAAGAAATCATCCAGGCG	AAACTCTGCCTCCAGCTCTC
MEOX2	AAGAGGAAAAGCGACAGCTC	ATGATGGGCAAATCTGCTT
GAPDH	CACATCGCTCAGACACCATG	GAATCCACGTAAGTCTCAG