Table SI. Primers used for cloning, RT-qPCR and CUT&RUN assays.

A, Cloning primers	
Primer name	Sequence (5'→3')
T_sh1-ZNF469	ccggTAGCTTCCCAGGTGCTAATTTctcgagAAATTAGCACCTGGGAAGCTAttttt
B_sh1-ZNF469	aattaaaaaTAGCTTCCCAGGTGCTAATTTctcgagAAATTAGCACCTGGGAAGCTA
T_sh2-ZNF469	ccggCCCGACCAGGAACTTTCATTTctcgagAAATGAAAGTTCCTGGTCGGGttttt
B_sh2-ZNF469	aattaaaaaCCCGACCAGGAACTTTCATTTctcgagAAATGAAAGTTCCTGGTCGGG
T_sh-Scramble	ccggCCTAAGGTTAAGTCGCCCTCGctcgagCGAGGGCGACTTAACCTTAGGttttt
B_sh-Scramble	aattaaaaaCCTAAGGTTAAGTCGCCCTCGctcgagCGAGGGCGACTTAACCTTAGG
B, RT-qPCR primers	
Primer name	Sequence (5'→3')
F_RPL19	GCTCTTTCCTTTCGCTGCT
R_RPL19	CATTGGTCTCATTGGGGTCT
F_ZNF469	GTGGATGTAGCGTTGCTCTTAT
R_ZNF469	CTCCTTTGCAGCTGACTTTCTA
F_COL1A1	CCCAAGGCTTCCAAGGTC
R_COL1A1	GGACGACCAGGTTTTCCAG
F_COL1A2	GAGTCCGAGGACCTAATGGA
R_COL1A2	AGGGGAACCAGGAAGACCT
F_COL3A1	TGGTGGTAAAGGCGAAATG
R_COL3A1	AGTCCAGGAGCACCATTAGC
F_COL4A1	GGGTGAACCAGGAAAAATTG
R_COL4A1	GGAAAGCCTCGGTCTCCTT
F_COL5A1	GACTGCCAGATTTGGACACTAT

R_COL5A1	GGATGACCTTTACGAGGCTTAC
F_COL5A2	GAGGGTCTCAGTTCGCTTATG
R_COL5A2	GATGTTCTGGGAGGCTTCTTT
F_COL5A3	TGGTGCTGCCCTATTTATACC
R_COL5A3	GGGCTGGAATCTCTCATCATATC
F_COL11A1	TGAGCCAAATCCAGTTGAAGA
R_COL11A1	CAGAATCCCTGCCGTCTATTT
F_COL12A1	CTGTGACTGTAGTTCCCGTTTAT
R_COL12A1	GAGGCTGTTAGGTGTAGGATTG
F_COL15A1	CCACCTACCGAGCATTCTTATC
R_COL15A1	CTTGAGGTTCACTATGGGAAGG
F_LOXL2	TTGGAGGACACAGAATGTGAA
R_LOXL2	AGTCGATGTCATGGCGGTA
F_TIMP1	CTGTTGTTGCTGTGGCTGAT
R_TIMP1	AACTTGGCCCTGATGACG
F_ACTA2	CTGTTCCAGCCATCCTTCA
R_ACTA2	TCATGATGCTGTTGTAGGTGGT
F_FN1	CCACAGTGGAGTATGTGGTTAG
R_FN1	CAGTCCTTTAGGGCGATCAAT
F_SERPINH1	GTGAGACCAAATTGAGCTAGGG
R_SERPINH1	TAGTTGGGAGAGGTTGGGATAG
F_ADAMTS3	TGATGGAACGCACTGTTCTTA
R_ADAMTS3	CTCCACAGACACCACACTTATC
F_P4HA2	CTGTTGTGGCCCGAGTAAA
R_P4HA2	ACTGTCCTCCCACTCCATAA
F_ITGA2	ACATCCCAGACATCCCAATATG

R_ITGA2	CCACCAGAAGCTGCTGAATA
F_ITGA6	TTGGCGAGCAAGCTATGAA
R_ITGA6	CTGTGCCGAGGTTTGTAAGA
F_COMP	GTGGGTTGGAAGGACAAGAA
R_COMP	CATAGAATCGCACCCTGATGT
F_SPARC	TACATCGGGCCTTGCAAATA
R_SPARC	TGTCCTCATCCCTCTCATACA
F_FBN2	GGAAGAGAGCAATGAGGATGAC
R_FBN2	CCCAAGTCTGTGAAGGGTTAAT
F_POSTN	CGGATCTTGTGGCCCAATTA
R_POSTN	GCTGATCCATGCTGAGAGTATC
F_NREP	GCAAACCCAAGGGCAAATATC
R_NREP	AGAGGCAGCTCTGCAAATAC
F_CEBPD	CCTGGACTTACCACCACTAAAC
R_CEBPD	GCTGCATCAACAGGAGTAAGA
C, CUT&RUN primers	
Primer name	Sequence (5'→3')
F_COL1A1	TAGATTGGAGGTCCCAGGAA
R_COL1A1	AGAATGGCGTGGGCTAAC
F_COL1A2	GTATGCAGACAACGAGTCAGAG
R_COL1A2	TTTGAGGACGTGGACACTTT
F_COL3A1	CATAAGCAGATGCATACAAACTCC
R_COL3A1	GAAGACACAACCCACAGTAAGA
F_COL4A1	GCGGGAGCCTCTTGAGT
R_COL4A1	GGAGTGTGGCTGCAGTG
F_COL5A2	CTGGATTTCCTTCGGAATGTCT
R_COL5A2	CCAGACACACACCCTTTAACT
F_PLOD2	CACTTCAGACTGGGTGGAGTAT
R_PLOD2	GCCTCGAAGGGTGAGAATTTG
F_FLRT2	GCGGAGAGCAGAGAAGTAAAG

R_FLRT2	GCCTCCAGTTACCGGATTTATT
F_ADAMTS3	AATTCTCTGGCTGGGAGAAC
R_ADAMTS3	GACGCGCGTTGAGTTAATTATAG
F_COL12A1	GGAGGTGGTGATATCAGATGAAG
R_COL12A1	GGAAATGCAAGGATGCGTAAC
F_COMP	CATGGGAGACTGAAGCAAGAG
R_COMP	TGTGTGTGTGTGTGTGTGT
F_POSTN	GAGTTCAGACTCTCAGGTTGATG
R_POSTN	GGCTTTGGAGAGCTCAGAAT
F_NREP	CGCCAGCTCCATCAGAATTA
R_NREP	AGAGTCTCTCTCTCTCCCTTTC
F_ASPN	ATGACTCCGACTGCACTTTC
R_ASPN	GTATCGTAGCCAAGACTTCTAGC
F_MGP	CAGAGCAGCATCCTGTGTAA
R_MGP	GAAGGGTTGGCACTGAACTA

In the cloning primer sequences, uppercase letters represent the sense and antisense strands of the shRNA, while the lowercase letters denote the restriction sites at each end, the hairpin loop in the middle and the terminal sequence. RT-qPCR, reverse transcription-quantitative PCR; CUT&RUN, cleavage under targets and release using nuclease; T, top; B, bottom; sh, short hairpin; F, forward; R, reverse; ZNF469, zinc finger 469; RPL19, ribosomal protein L19; COL, collagen; LOXL2, lysyl oxidase like 2; TIMP1, TIMP metallopeptidase inhibitor 1; ACTA2, α-smooth muscle actin; FN1, fibronectin 1; SERPINH1, serpin family H member 1; ADAMTS3, *ADAM metallopeptidase with thrombospondin type 1 motif 3; P4HA2, prolyl 4-hydroxylase subunit α 2; ITGA2/6, integrin α 2/6; COMP,* cartilage oligomeric matrix protein; SPARC, osteonectin; FBN2, fibrillin 2; POSTN, periostin; NREP, neuronal regeneration related protein; CEBPD, CCAAT/enhancer binding protein δ; ; PLOD2, procollagen-lysine, 2-oxoglutarate 5-dioxygenase 2; FLRT2, fibronectin leucine rich transmembrane protein 2; ASPN, asporin; MGP, matrix Gla protein.

Table SII. List of upregulated and downregulated DEGs in ZNF469-knockdown normal fibroblasts.

A, Upregulated DEGs		
ID	Gene symbol	Gene name
ENSG00000163945	UVSSA	UV stimulated scaffold protein A
ENSG00000165895	ARHGAP42	Rho GTPase activating protein 42
ENSG00000137941	TTLL7	tubulin tyrosine ligase like 7
ENSG00000092969	TGFB2	transforming growth factor β 2
ENSG00000152154	TMEM178A	transmembrane protein 178A
ENSG00000136040	PLXNC1	plexin C1
ENSG00000125730	C3	complement C3
ENSG00000107317	PTGDS	prostaglandin D2 synthase
ENSG00000172817	CYP7B1	cytochrome P450 family 7 subfamily B member 1
ENSG00000163827	LRRC2	leucine rich repeat containing 2
ENSG00000137507	LRRC32	leucine rich repeat containing 32
ENSG00000163131	CTSS	cathepsin S
ENSG00000269001	ZNF818P	zinc finger protein 818, pseudogene
ENSG00000009413	REV3L	REV3 like, DNA directed polymerase ζ catalytic subunit
ENSG00000165359	INTS6L	integrator complex subunit 6 like
ENSG00000140876	NUDT7	nudix hydrolase 7
ENSG00000014914	MTMR11	myotubularin related protein 11
ENSG00000006747	SCIN	scinderin
ENSG00000253910	PCDHGB2	protocadherin γ subfamily B, 2
ENSG00000258728	AL162231.3	novel protein (GALT-IL11RA readthrough)
ENSG00000160712	IL6R	interleukin 6 receptor
ENSG00000189195	BTBD8	BTB domain containing 8
ENSG00000125966	MMP24	matrix metallopeptidase 24
ENSG00000146374	RSPO3	R-spondin 3
ENSG00000196605	ZNF846	zinc finger protein 846

ENSG00000076258	FMO4	flavin containing dimethylaniline monoxygenase 4
ENSG00000120915	EPHX2	epoxide hydrolase 2
ENSG00000113739	STC2	stanniocalcin 2
ENSG00000143387	CTSK	cathepsin K
ENSG00000162407	PLPP3	phospholipid phosphatase 3
ENSG00000103710	RASL12	RAS like family 12
ENSG00000177363	LRRN4CL	LRRN4 C-terminal like
ENSG00000163975	MELTF	melanotransferrin
ENSG00000158022	TRIM63	tripartite motif containing 63
ENSG00000156535	CD109	CD109 molecule
ENSG00000105499	PLA2G4C	phospholipase A2 group IVC
ENSG00000251562	MALAT1	metastasis associated lung adenocarcinoma transcript 1
ENSG00000182752	PAPPA	pappalysin 1
ENSG00000215769	ARHGAP27P1-BPTFP1-KPNA2P3	ARHGAP27P1-BPTFP1-KPNA2P3 readthrough, transcribed pseudogene
ENSG00000278962	AC092645.1	TEC
ENSG00000189001	SBSN	suprabasin
ENSG00000125965	GDF5	growth differentiation factor 5
ENSG00000073670	ADAM11	ADAM metallopeptidase domain 11
ENSG00000248527	MTATP6P1	MT-ATP6 pseudogene 1
ENSG00000133083	DCLK1	doublecortin like kinase 1
ENSG00000198932	GPRASP1	G protein-coupled receptor associated sorting protein 1
ENSG00000071794	HLTF	helicase like transcription factor
ENSG00000134470	IL15RA	interleukin 15 receptor subunit α
ENSG00000186615	KTN1-AS1	KTN1 antisense RNA 1
ENSG00000183762	KREMEN1	kringle containing transmembrane protein 1

ENSG00000069020	MAST4	microtubule associated serine/threonine kinase family member 4
ENSG00000165434	PGM2L1	phosphoglucomutase 2 like 1
ENSG00000223745	CCDC18-AS1	CCDC18 antisense RNA 1
ENSG00000167549	CORO6	coronin 6
ENSG00000180155	LYNX1	Ly6/neurotoxin 1
ENSG00000102445	RUBCNL	rubicon like autophagy enhancer
ENSG00000291237	SOD2	superoxide dismutase 2
ENSG00000211445	GPX3	glutathione peroxidase 3
ENSG00000160323	ADAMTS13	ADAM metallopeptidase with thrombospondin type 1 motif 13
ENSG00000038427	VCAN	versican
ENSG00000182621	PLCB1	phospholipase C β 1
ENSG00000141524	TMC6	transmembrane channel like 6
ENSG00000135604	STX11	syntaxin 11
ENSG00000124249	KCNK15	potassium two pore domain channel subfamily K member 15
ENSG00000188042	ARL4C	ADP ribosylation factor like GTPase 4C
ENSG00000134769	DTNA	dystrobrevin α
ENSG00000196839	ADA	adenosine deaminase
ENSG00000106772	PRUNE2	prune homolog 2 with BCH domain
ENSG00000162878	PKDCC	protein kinase domain containing, cytoplasmic
ENSG00000064309	CDON	cell adhesion associated, oncogene regulated
ENSG00000008311	AASS	aminoadipate-semialdehyde synthase
ENSG00000178115	GOLGA8Q	golgin A8 family member Q
ENSG00000253537	PCDHGA7	protocadherin γ subfamily A, 7
ENSG00000182575	NXPH3	neurexophilin 3
ENSG00000257337	TNS2-AS1	TNS2 antisense RNA 1
ENSG00000204767	INSYN2B	inhibitory synaptic factor family member 2B
ENSG00000170873	MTSS1	MTSS I-BAR domain containing 1

ENSG00000159251	ACTC1	actin α cardiac muscle 1
ENSG00000196189	SEMA4A	semaphorin 4A
ENSG00000139364	TMEM132B	transmembrane protein 132B
ENSG00000178015	GPR150	G protein-coupled receptor 150
ENSG00000164066	INTU	inturned planar cell polarity protein
ENSG00000185567	AHNAK2	AHNAK nucleoprotein 2
ENSG00000173258	ZNF483	zinc finger protein 483
ENSG00000198719	DLL1	δ like canonical Notch ligand 1
ENSG00000173947	CIMAP3	ciliary microtubule associated protein 3
ENSG00000145824	CXCL14	C-X-C motif chemokine ligand 14
ENSG00000262576	PCDHGA4	protocadherin γ subfamily A, 4
ENSG00000171791	BCL2	BCL2 apoptosis regulator
ENSG00000225138	SLC9A3-AS1	SLC9A3 antisense RNA 1
ENSG00000276334	AL133243.2	novel transcript, sense intronic to BIRC6
ENSG00000246067	RAB30-DT	RAB30 divergent transcript
ENSG00000171798	KNDC1	kinase non-catalytic C-lobe domain containing 1
ENSG00000186868	MAPT	microtubule associated protein τ
ENSG00000149016	TUT1	terminal uridylyl transferase 1, U6 snRNA-specific
ENSG00000013293	SLC7A14	solute carrier family 7 member 14
ENSG00000244558	KCNK15-AS1	KCNK15 and WISP2 antisense RNA 1
ENSG00000137975	CLCA2	chloride channel accessory 2
ENSG00000164929	BAALC	BAALC binder of MAP3K1 and KLF4
ENSG00000025039	RRAGD	Ras related GTP binding D
ENSG00000136689	IL1RN	interleukin 1 receptor antagonist
ENSG00000123496	IL13RA2	interleukin 13 receptor subunit α 2
ENSG00000088836	SLC4A11	solute carrier family 4 member 11
ENSG00000100167	SEPTIN3	septin 3
ENSG00000258498	DIO3OS	DIO3 opposite strand upstream RNA
ENSG00000178947	SMIM10L2A	small integral membrane protein 10 like 2A
ENSG00000254860	TMEM9B-AS1	TMEM9B antisense RNA 1

ENSG00000173531	MST1	macrophage stimulating 1
ENSG00000284526	AC015802.6	novel protein
ENSG00000264772	AC016876.2	novel transcript
ENSG00000167992	VWCE	von Willebrand factor C and EGF domains
ENSG00000131386	GALNT15	polypeptide N-acetylgalactosaminyltransferase 15
ENSG00000225783	MIAT	myocardial infarction associated transcript
ENSG00000072041	SLC6A15	solute carrier family 6 member 15
ENSG00000185664	PMEL	premelanosome protein
ENSG00000178038	ALS2CL	ALS2 C-terminal like
ENSG00000162643	DNAI3	dynein axonemal intermediate chain 3
ENSG00000081853	PCDHGA2	protocadherin γ subfamily A, 2
ENSG00000176406	RIMS2	regulating synaptic membrane exocytosis 2
ENSG00000291129	PPIEL	peptidylprolyl isomerase E like (pseudogene)
ENSG00000102878	HSF4	heat shock transcription factor 4
ENSG00000100478	AP4S1	adaptor related protein complex 4 subunit σ 1
ENSG00000214140	PRCD	photoreceptor disc component
ENSG00000141469	SLC14A1	solute carrier family 14 member 1 (Kidd blood group)
ENSG00000161381	PLXDC1	plexin domain containing 1
ENSG00000162004	CCDC78	coiled-coil domain containing 78
ENSG00000291117	AC103810.5	novel transcript
ENSG00000154153	RETREG1	reticulophagy regulator 1
ENSG00000082074	FYB1	FYN binding protein 1
ENSG00000213742	ZNF337-AS1	ZNF337 antisense RNA 1
ENSG00000293508	POLR1HASP	POLR1H antisense, pseudogene
ENSG00000172137	CALB2	calbindin 2
ENSG00000065320	NTN1	netrin 1
ENSG00000166262	FAM227B	family with sequence similarity 227 member B
ENSG00000279689	AC022400.7	TEC
ENSG00000108932	SLC16A6	solute carrier family 16 member 6

ENSG00000244694	PTCHD4	patched domain containing 4
ENSG00000140297	GCNT3	glucosaminyl (N-acetyl) transferase 3, mucin type
ENSG00000287725	AP003071.5	novel protein, TPCN2 - SMIM38 readthrough
ENSG00000260051	AL031600.1	novel transcript, antisense to CLCN7
ENSG00000257524	AL157935.2	novel protein
ENSG00000285043	AC093512.2	uncharaterized LOC112694756
ENSG00000198203	SULT1C2	sulfotransferase family 1C member 2
ENSG00000262468	LINC01569	long intergenic non-protein coding RNA 1569
ENSG00000269019	HOMER3-AS1	HOMER3 antisense RNA 1
ENSG00000258377	AL139099.1	novel transcript
ENSG00000285292	ABCF2-H2BK1	ABCF2-H2BK1 readthrough
ENSG00000234857	HNRNPUL2-BSCL2	HNRNPUL2-BSCL2 readthrough (NMD candidate)
ENSG00000258790	AL121594.1	novel transcript
ENSG00000113296	THBS4	thrombospondin 4
ENSG00000272537	AC005014.3	novel transcript
ENSG00000228784	LINC00954	long intergenic non-protein coding RNA 954
ENSG00000289987	AL360218.2	novel transcript, antisense to KLF4
ENSG00000271869	DCTN6-DT	DCTN6 divergent transcript
ENSG00000246662	CIBAR1-DT	CIBAR1 divergent transcript
ENSG00000181097	LINC02878	long intergenic non-protein coding RNA 2878
ENSG00000276115	AC026356.2	novel transcript, sense intronic to BICD1
ENSG00000162482	AKR7A3	aldo-keto reductase family 7 member A3
ENSG00000290685	AL583839.12	novel transcript
ENSG00000181016	LSMEM1	leucine rich single-pass membrane protein 1
ENSG00000286808	AC092338.3	novel transcript, antisense to POLR3E
ENSG00000228492	RAB11FIP1P1	RAB11 family interacting protein 1 pseudogene 1
ENSG00000142530	GARIN5A	golgi associated RAB2 interactor 5A
ENSG00000237879	LINC00398	long intergenic non-protein coding RNA 398
ENSG00000280063	AC012676.5	tec

ENSG00000228889	UBAC2-AS1	UBAC2 antisense RNA 1
ENSG00000257511	AC084824.1	nucleosome assembly protein 1-like 1 (NAP1L1) pseudogene
ENSG00000248751	AC004997.1	novel protein
ENSG00000288586	AL357874.3	novel transcript
ENSG00000270441	LAMB2P1	laminin subunit β 2 pseudogene 1
ENSG00000157653	C9orf43	chromosome 9 open reading frame 43
ENSG00000176920	FUT2	fucosyltransferase 2
ENSG00000128564	VGF	VGF nerve growth factor inducible
ENSG00000232811	AL360270.1	novel transcript
ENSG00000276791	AC092117.1	novel transcript
ENSG00000251279	SMIM15-AS1	SMIM15 antisense RNA 1
ENSG00000248719	PRDM8-AS1	PRDM8 antisense RNA 1
ENSG00000160870	CYP3A7	cytochrome P450 family 3 subfamily A member 7
ENSG00000125740	FOSB	FosB proto-oncogene, AP-1 transcription factor subunit
ENSG00000256751	PLBD1-AS1	PLBD1 antisense RNA 1
ENSG00000138646	HERC5	HECT and RLD domain containing E3 ubiquitin protein ligase 5
ENSG00000165923	AGBL2	AGBL carboxypeptidase 2
ENSG00000286999	AL121581.3	novel transcript, antisense to OPRL1
ENSG00000286116	AL157394.3	FAS antisense RNA 1
ENSG00000171246	NPTX1	neuronal pentraxin 1
ENSG00000282164	PEG13	paternally expressed 13
ENSG00000196557	CACNA1H	calcium voltage-gated channel subunit α1 H
ENSG00000155846	PPARGC1B	PPARG coactivator 1 β
ENSG00000182463	TSHZ2	teashirt zinc finger homeobox 2
ENSG00000155966	AFF2	ALF transcription elongation factor 2
ENSG00000250337	PURPL	p53 upregulated regulator of p53 levels
ENSG00000293669	None	None

ENSG00000296911	None	None
ENSG00000310521	None	None
B, Downregulated DEGs		
ID	Gene symbol	Gene name
ENSG00000128165	ADM2	adrenomedullin 2
ENSG00000284713	SMIM38	small integral membrane protein 38
ENSG00000196584	XRCC2	X-ray repair cross complementing 2
ENSG00000139269	INHBE	inhibin subunit β E
ENSG00000181544	FANCB	FA complementation group B
ENSG00000145287	PLAC8	placenta associated 8
ENSG00000007968	E2F2	E2F transcription factor 2
ENSG00000260063	AL512408.1	novel transcript, antisense to ARID1A
ENSG00000182257	PRR34	PRR34 long non-coding RNA
ENSG00000279393	AL139005.1	TEC
ENSG00000250318	RPL13AP26	ribosomal protein L13a pseudogene 26
ENSG00000287619	AL021308.1	novel transcript
ENSG00000189057	FAM111B	FAM111 trypsin like peptidase B
ENSG00000144395	CCDC150	coiled-coil domain containing 150
ENSG00000257529	RPL36A-HNRNPH2	RPL36A-HNRNPH2 readthrough
ENSG00000126246	IGFLR1	IGF like family receptor 1
ENSG00000255508	AP002990.1	novel protein
ENSG00000203930	LINC00632	long intergenic non-protein coding RNA 632
ENSG00000101057	MYBL2	MYB proto-oncogene like 2
ENSG00000135069	PSAT1	phosphoserine aminotransferase 1
ENSG00000165244	ZNF367	zinc finger protein 367
ENSG00000093009	CDC45	cell division cycle 45
ENSG00000094804	CDC6	cell division cycle 6
ENSG00000258017	TUBA1B-AS1	TUBA1B antisense RNA 1
ENSG00000143476	DTL	denticleless E3 ubiquitin protein ligase homolog

ENSG00000024526	DEPDC1	DEP domain containing 1
ENSG00000152253	SPC25	SPC25 component of NDC80 kinetochore complex
ENSG00000092853	CLSPN	claspin
ENSG00000101412	E2F1	E2F transcription factor 1
ENSG00000173391	OLR1	oxidized low density lipoprotein receptor 1
ENSG00000174371	EXO1	exonuclease 1
ENSG00000105011	ASF1B	anti-silencing function 1B histone chaperone
ENSG00000177459	ERICH5	glutamate rich 5
ENSG00000131153	GINS2	GINS complex subunit 2
ENSG00000108821	COL1A1	collagen type I α 1 chain
ENSG00000122952	ZWINT	ZW10 interacting kinetochore protein
ENSG00000163751	CPA3	carboxypeptidase A3
ENSG00000127564	PKMYT1	protein kinase, membrane associated tyrosine/threonine 1
ENSG00000128965	CHAC1	ChaC glutathione specific γ-glutamylcyclotransferase 1
ENSG00000237649	KIFC1	kinesin family member C1
ENSG00000178999	AURKB	aurora kinase B
ENSG00000242114	MTFP1	mitochondrial fission process 1
ENSG00000196517	SLC6A9	solute carrier family 6 member 9
ENSG00000179750	APOBEC3B	apolipoprotein B mRNA editing enzyme catalytic subunit 3B
ENSG00000148677	ANKRD1	ankyrin repeat domain 1
ENSG00000100162	CENPM	centromere protein M
ENSG00000165490	DDIAS	DNA damage induced apoptosis suppressor
ENSG00000117152	RGS4	regulator of G protein signaling 4
ENSG00000154146	NRGN	neurogranin
ENSG00000171241	SHCBP1	SHC binding and spindle associated 1
ENSG00000139318	DUSP6	dual specificity phosphatase 6
ENSG00000111247	RAD51AP1	RAD51 associated protein 1

ENSG00000131470	PSMC3IP	PSMC3 interacting protein
ENSG00000143228	NUF2	NUF2 component of NDC80 kinetochore complex
ENSG00000171848	RRM2	ribonucleotide reductase regulatory subunit M2
ENSG00000085840	ORC1	origin recognition complex subunit 1
ENSG00000168496	FEN1	flap structure-specific endonuclease 1
ENSG00000092621	PHGDH	phosphoglycerate dehydrogenase
ENSG00000146670	CDCA5	cell division cycle associated 5
ENSG00000186185	KIF18B	kinesin family member 18B
ENSG00000075702	WDR62	WD repeat domain 62
ENSG00000103257	SLC7A5	solute carrier family 7 member 5
ENSG00000156970	BUB1B	BUB1 mitotic checkpoint serine/threonine kinase B
ENSG00000121152	NCAPH	non-SMC condensin I complex subunit H
ENSG00000276043	UHRF1	ubiquitin like with PHD and ring finger domains 1
ENSG00000134690	CDCA8	cell division cycle associated 8
ENSG00000256663	AC112777.1	ubiquitin-like with PHD and ring finger domains 1 (UHRF1) pseudogene
ENSG00000156876	SASS6	SAS-6 centriolar assembly protein
ENSG00000169607	CKAP2L	cytoskeleton associated protein 2 like
ENSG00000167900	TK1	thymidine kinase 1
ENSG00000101003	GINS1	GINS complex subunit 1
ENSG00000147573	TRIM55	tripartite motif containing 55
ENSG00000203667	COX20	cytochrome c oxidase assembly factor COX20
ENSG00000166851	PLK1	polo like kinase 1
ENSG00000013810	TACC3	transforming acidic coiled-coil containing protein 3
ENSG00000143473	KCNH1	potassium voltage-gated channel subfamily H member 1
ENSG00000137310	TCF19	transcription factor 19
ENSG00000166396	SERPINB7	serpin family B member 7
ENSG00000100297	MCM5	minichromosome maintenance complex component 5

ENSG00000100479	POLE2	DNA polymerase ε 2, accessory subunit
ENSG00000154920	EME1	essential meiotic structure-specific endonuclease 1
ENSG00000142731	PLK4	polo like kinase 4
ENSG00000123219	CENPK	centromere protein K
ENSG00000230623	AC104461.1	novel transcript, antisense to ZNF281
ENSG00000080986	NDC80	NDC80 kinetochore complex component
ENSG00000066279	ASPM	assembly factor for spindle microtubules
ENSG00000113140	SPARC	secreted protein acidic and cysteine rich
ENSG00000101447	FAM83D	family with sequence similarity 83 member D
ENSG00000112742	TTK	TTK protein kinase
ENSG00000170312	CDK1	cyclin dependent kinase 1
ENSG00000151725	CENPU	centromere protein U
ENSG00000175063	UBE2C	ubiquitin conjugating enzyme E2 C
ENSG00000090889	KIF4A	kinesin family member 4A
ENSG00000205683	DPF3	double PHD fingers 3
ENSG00000178531	CTXN1	cortexin 1
ENSG00000049540	ELN	elastin
ENSG00000185633	NDUFA4L2	NDUFA4 mitochondrial complex associated like 2
ENSG00000071539	TRIP13	thyroid hormone receptor interactor 13
ENSG00000109805	NCAPG	non-SMC condensin I complex subunit G
ENSG00000147536	GINS4	GINS complex subunit 4
ENSG00000165480	SKA3	spindle and kinetochore associated complex subunit 3
ENSG00000123485	HJURP	Holliday junction recognition protein
ENSG00000120738	EGR1	early growth response 1
ENSG00000117650	NEK2	NIMA related kinase 2
ENSG00000144554	FANCD2	FA complementation group D2
ENSG00000118193	KIF14	kinesin family member 14
ENSG00000011426	ANLN	anillin, actin binding protein
ENSG00000151892	GFRA1	GDNF family receptor α 1

ENSG00000168685	IL7R	interleukin 7 receptor
ENSG00000145386	CCNA2	cyclin A2
ENSG00000076382	SPAG5	sperm associated antigen 5
ENSG00000148773	MKI67	marker of proliferation Ki-67
ENSG00000186193	SAPCD2	suppressor APC domain containing 2
ENSG00000175832	ETV4	ETS variant transcription factor 4
ENSG00000126787	DLGAP5	DLG associated protein 5
ENSG00000075218	GTSE1	G2 and S-phase expressed 1
ENSG00000072274	TFRC	transferrin receptor
ENSG00000089685	BIRC5	baculoviral IAP repeat containing 5
ENSG00000092470	WDR76	WD repeat domain 76
ENSG00000169679	BUB1	BUB1 mitotic checkpoint serine/threonine kinase
ENSG00000131351	HAUS8	HAUS augmin like complex subunit 8
ENSG00000012048	BRCA1	BRCA1 DNA repair associated
ENSG00000247095	MIR210HG	MIR210 host gene
ENSG00000117399	CDC20	cell division cycle 20
ENSG00000112984	KIF20A	kinesin family member 20A
ENSG00000108691	CCL2	C-C motif chemokine ligand 2
ENSG00000167513	CDT1	chromatin licensing and DNA replication factor 1
ENSG00000113368	LMNB1	lamin B1
ENSG00000225614	ZNF469	zinc finger protein 469
ENSG00000142945	KIF2C	kinesin family member 2C
ENSG00000072571	HMMR	hyaluronan mediated motility receptor
ENSG00000138180	CEP55	centrosomal protein 55
ENSG00000163808	KIF15	kinesin family member 15
ENSG00000203706	SERTAD4-AS1	SERTAD4 antisense RNA 1
ENSG00000117724	CENPF	centromere protein F
ENSG00000106003	LFNG	LFNG O-fucosylpeptide 3-β-N-acetylglucosaminyltransferase
ENSG00000109674	NEIL3	nei like DNA glycosylase 3

ENSG00000286013	AC005050.2	novel transcript
ENSG00000176208	ATAD5	ATPase family AAA domain containing 5
ENSG00000164171	ITGA2	integrin subunit α 2
ENSG00000122884	P4HA1	prolyl 4-hydroxylase subunit α 1
ENSG00000168078	PBK	PDZ binding kinase
ENSG00000091651	ORC6	origin recognition complex subunit 6
ENSG00000160957	RECQL4	RecQ like helicase 4
ENSG00000173166	RAPH1	Ras association (RalGDS/AF-6) and pleckstrin homology domains 1
ENSG00000162630	B3GALT2	β-1,3-galactosyltransferase 2
ENSG00000187741	FANCA	FA complementation group A
ENSG00000070669	ASNS	asparagine synthetase (glutamine-hydrolyzing)
ENSG00000104738	MCM4	minichromosome maintenance complex component 4
ENSG00000166448	TMEM130	transmembrane protein 130
ENSG00000223749	MIR503HG	MIR503 host gene
ENSG00000135451	TROAP	trophinin associated protein
ENSG00000102384	CENPI	centromere protein I
ENSG00000181938	GINS3	GINS complex subunit 3
ENSG00000185697	MYBL1	MYB proto-oncogene like 1
ENSG00000123689	G0S2	G0/G1 switch 2
ENSG00000170961	HAS2	hyaluronan synthase 2
ENSG00000004864	SLC25A13	solute carrier family 25 member 13
ENSG00000179431	FJX1	four-jointed box kinase 1
ENSG00000164045	CDC25A	cell division cycle 25A
ENSG00000065911	MTHFD2	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 2, methenyltetrahydrofolate cyclohydrolase
ENSG00000101945	SUV39H1	SUV39H1 histone lysine methyltransferase
ENSG00000137393	RNF144B	ring finger protein 144B

ENSG00000073111	MCM2	minichromosome maintenance complex component 2
ENSG00000154839	SKA1	spindle and kinetochore associated complex subunit 1
ENSG00000164109	MAD2L1	mitotic arrest deficient 2 like 1
ENSG00000134057	CCNB1	cyclin B1
ENSG00000120217	CD274	CD274 molecule
ENSG00000228716	DHFR	dihydrofolate reductase
ENSG00000137812	KNL1	kinetochore scaffold 1
ENSG00000111665	CDCA3	cell division cycle associated 3
ENSG00000162073	PAQR4	progestin and adipoQ receptor family member 4
ENSG00000136492	BRIP1	BRCA1 interacting helicase 1
ENSG00000168209	DDIT4	DNA damage inducible transcript 4
ENSG00000166451	CENPN	centromere protein N
ENSG00000079616	KIF22	kinesin family member 22
ENSG00000131737	KRT34	keratin 34
ENSG00000035499	DEPDC1B	DEP domain containing 1B
ENSG00000228589	SPCS2P4	signal peptidase complex subunit 2 pseudogene 4
ENSG00000087586	AURKA	aurora kinase A
ENSG00000182010	RTKN2	rhotekin 2
ENSG00000131747	TOP2A	DNA topoisomerase II α
ENSG00000049541	RFC2	replication factor C subunit 2
ENSG00000161888	SPC24	SPC24 component of NDC80 kinetochore complex
ENSG00000112029	FBXO5	F-box protein 5
ENSG00000165891	E2F7	E2F transcription factor 7
ENSG00000184661	CDCA2	cell division cycle associated 2
ENSG00000133119	RFC3	replication factor C subunit 3
ENSG00000100526	CDKN3	cyclin dependent kinase inhibitor 3
ENSG00000153879	CEBPG	CCAAT enhancer binding protein γ
ENSG00000170006	TMEM154	transmembrane protein 154

ENSG00000137809	ITGA11	integrin subunit α 11
ENSG00000255150	EID3	EP300 interacting inhibitor of differentiation 3
ENSG00000068489	PRR11	proline rich 11
ENSG00000167670	CHAF1A	chromatin assembly factor 1 subunit A
ENSG00000166508	MCM7	minichromosome maintenance complex component 7
ENSG00000119969	HELLS	helicase, lymphoid specific
ENSG00000129195	PIMREG	PICALM interacting mitotic regulator
ENSG00000198901	PRC1	protein regulator of cytokinesis 1
ENSG00000157456	CCNB2	cyclin B2
ENSG00000138160	KIF11	kinesin family member 11
ENSG00000139734	DIAPH3	diaphanous related formin 3
ENSG00000164692	COL1A2	collagen type I α 2 chain
ENSG00000242265	PEG10	paternally expressed 10
ENSG00000139278	GLIPR1	GLI pathogenesis related 1
ENSG00000014138	POLA2	DNA polymerase α 2, accessory subunit
ENSG00000104889	RNASEH2A	ribonuclease H2 subunit A
ENSG00000175643	RMI2	RecQ mediated genome instability 2
ENSG00000023445	BIRC3	baculoviral IAP repeat containing 3
ENSG00000250634	LINC01182	long intergenic non-protein coding RNA 1182
ENSG00000113645	WWC1	WW and C2 domain containing 1
ENSG00000089280	FUS	FUS RNA binding protein
ENSG00000082497	SERTAD4	SERTA domain containing 4
ENSG00000130748	TMEM160	transmembrane protein 160
ENSG00000125148	MT2A	metallothionein 2A
ENSG00000137807	KIF23	kinesin family member 23
ENSG00000145604	SKP2	S-phase kinase associated protein 2
ENSG00000168542	COL3A1	collagen type III α 1 chain
ENSG00000175197	DDIT3	DNA damage inducible transcript 3
ENSG00000239672	NME1	NME/NM23 nucleoside diphosphate kinase 1

ENSG00000088325	TPX2	TPX2 microtubule nucleation factor
ENSG00000111341	MGP	matrix Gla protein
ENSG00000125384	PTGER2	prostaglandin E receptor 2
ENSG00000166123	GPT2	glutamic-pyruvic transaminase 2
ENSG00000146918	NCAPG2	non-SMC condensin II complex subunit G2
ENSG00000173207	CKS1B	CDC28 protein kinase regulatory subunit 1B
ENSG00000181649	PHLDA2	pleckstrin homology like domain family A member 2
ENSG00000130590	SAMD10	sterile α motif domain containing 10
ENSG00000175567	UCP2	uncoupling protein 2
ENSG00000138182	KIF20B	kinesin family member 20B
ENSG00000164611	PTTG1	PTTG1 regulator of sister chromatid separation, securin
ENSG00000101255	TRIB3	tribbles pseudokinase 3
ENSG00000198959	TGM2	transglutaminase 2
ENSG00000183010	PYCR1	pyrroline-5-carboxylate reductase 1
ENSG00000118523	CCN2	cellular communication network factor 2
ENSG00000111602	TIMELESS	timeless circadian regulator
ENSG00000058804	NDC1	NDC1 transmembrane nucleoporin
ENSG00000169583	CLIC3	chloride intracellular channel 3
ENSG00000165304	MELK	maternal embryonic leucine zipper kinase
ENSG00000123975	CKS2	CDC28 protein kinase regulatory subunit 2
ENSG00000129422	MTUS1	microtubule associated scaffold protein 1
ENSG00000215114	UBXN2B	UBX domain protein 2B
ENSG00000006625	GGCT	γ-glutamylcyclotransferase
ENSG00000140105	WARS1	tryptophanyl-tRNA synthetase 1
ENSG00000111057	KRT18	keratin 18
ENSG00000187840	EIF4EBP1	eukaryotic translation initiation factor 4E binding protein 1
ENSG00000226415	TPI1P1	triosephosphate isomerase 1 pseudogene 1
ENSG00000123136	DDX39A	DExD-box helicase 39A

ENSG00000153993	SEMA3D	semaphorin 3D
ENSG00000176890	TYMS	thymidylate synthetase
ENSG00000168497	CAVIN2	caveolae associated protein 2
ENSG00000102554	KLF5	KLF transcription factor 5
ENSG00000123416	TUBA1B	tubulin α 1b
ENSG00000168282	MGAT2	α-1,6-mannosyl-glycoprotein 2-β-N-acetylglucosaminyltransferase
ENSG00000138092	CENPO	centromere protein O
ENSG00000123080	CDKN2C	cyclin dependent kinase inhibitor 2C
ENSG00000166803	PCLAF	PCNA clamp associated factor
ENSG00000158859	ADAMTS4	ADAM metallopeptidase with thrombospondin type 1 motif 4
ENSG00000145147	SLIT2	slit guidance ligand 2
ENSG00000164032	H2AZ1	H2A.Z variant histone 1
ENSG00000133169	BEX1	brain expressed X-linked 1
ENSG00000111206	FOXM1	forkhead box M1
ENSG00000160193	WDR4	WD repeat domain 4
ENSG00000144645	OSBPL10	oxysterol binding protein like 10
ENSG00000183856	IQGAP3	IQ motif containing GTPase activating protein 3
ENSG00000135476	ESPL1	extra spindle pole bodies like 1, separase
ENSG00000174442	ZWILCH	zwilch kinetochore protein
ENSG00000072501	SMC1A	structural maintenance of chromosomes 1A
ENSG00000116106	EPHA4	EPH receptor A4
ENSG00000062822	POLD1	DNA polymerase δ 1, catalytic subunit
ENSG00000163507	CIP2A	cellular inhibitor of PP2A
ENSG00000140025	EFCAB11	EF-hand calcium binding domain 11
ENSG00000204262	COL5A2	collagen type V α 2 chain
ENSG00000115163	CENPA	centromere protein A
ENSG00000051180	RAD51	RAD51 recombinase
ENSG00000104131	EIF3J	eukaryotic translation initiation factor 3 subunit J

ENSG00000140280	LYSMD2	LysM domain containing 2
ENSG00000140525	FANCI	FA complementation group I
ENSG00000182199	SHMT2	serine hydroxymethyltransferase 2
ENSG00000228221	LINC00578	long intergenic non-protein coding RNA 578
ENSG00000099783	HNRNPM	heterogeneous nuclear ribonucleoprotein M
ENSG00000100483	VCPKMT	valosin containing protein lysine methyltransferase
ENSG00000198890	PRMT6	protein arginine methyltransferase 6
ENSG00000184207	PGP	phosphoglycolate phosphatase
ENSG00000198964	SGMS1	sphingomyelin synthase 1
ENSG00000143367	TUFT1	tuftelin 1
ENSG00000100749	VRK1	VRK serine/threonine kinase 1
ENSG00000074800	ENO1	enolase 1
ENSG00000128342	LIF	LIF interleukin 6 family cytokine
ENSG00000125885	MCM8	minichromosome maintenance 8 homologous recombination repair factor
ENSG00000170855	TRIAP1	TP53 regulated inhibitor of apoptosis 1
ENSG00000134333	LDHA	lactate dehydrogenase A
ENSG00000133818	RRAS2	RAS related 2
ENSG00000134758	RNF138	ring finger protein 138
ENSG00000105486	LIG1	DNA ligase 1
ENSG00000117525	F3	coagulation factor III, tissue factor
ENSG00000132330	SCLY	selenocysteine lyase
ENSG00000144136	SLC20A1	solute carrier family 20 member 1
ENSG00000108179	PPIF	peptidylprolyl isomerase F
ENSG00000272695	GAS6-DT	GAS6 divergent transcript
ENSG00000274276	CBSL	cystathionine-β-synthase like
ENSG00000175471	MCTP1	multiple C2 and transmembrane domain containing 1
ENSG00000141052	MYOCD	myocardin
ENSG00000112118	MCM3	minichromosome maintenance complex component 3

ENSG00000169570	DTWD2	DTW domain containing 2
ENSG00000138376	BARD1	BRCA1 associated RING domain 1
ENSG00000138772	ANXA3	annexin A3
ENSG00000188486	H2AX	H2A.X variant histone
ENSG00000111669	TPI1	triosephosphate isomerase 1
ENSG00000213281	NRAS	NRAS proto-oncogene, GTPase
ENSG00000077152	UBE2T	ubiquitin conjugating enzyme E2 T
ENSG00000134013	LOXL2	lysyl oxidase like 2
ENSG00000214413	BBIP1	BBSome interacting protein 1
ENSG00000111348	ARHGDIB	Rho GDP dissociation inhibitor β
ENSG00000123473	STIL	STIL centriolar assembly protein
ENSG00000136450	SRSF1	serine and arginine rich splicing factor 1
ENSG00000175592	FOSL1	FOS like 1, AP-1 transcription factor subunit
ENSG00000187498	COL4A1	collagen type IV α 1 chain
ENSG00000161547	SRSF2	serine and arginine rich splicing factor 2
ENSG00000197451	HNRNPAB	heterogeneous nuclear ribonucleoprotein A/B
ENSG00000121621	KIF18A	kinesin family member 18A
ENSG00000132646	PCNA	proliferating cell nuclear antigen
ENSG00000136010	ALDH1L2	aldehyde dehydrogenase 1 family member L2
ENSG00000106819	ASPN	asporin
ENSG00000163535	SGO2	shugoshin 2
ENSG00000127528	KLF2	KLF transcription factor 2
ENSG00000198042	MAK16	MAK16 homolog
ENSG00000104219	ZDHHC2	zinc finger DHHC-type palmitoyltransferase 2
ENSG00000134986	NREP	neuronal regeneration related protein
ENSG00000153044	CENPH	centromere protein H
ENSG00000108559	NUP88	nucleoporin 88
ENSG00000277161	PIGW	phosphatidylinositol glycan anchor biosynthesis class W
ENSG00000213551	DNAJC9	DnaJ heat shock protein family (Hsp40) member C9

ENSG00000100219	XBP1	X-box binding protein 1
ENSG00000138190	EXOC6	exocyst complex component 6
ENSG00000204291	COL15A1	collagen type XV α 1 chain
ENSG00000130826	DKC1	dyskerin pseudouridine synthase 1
ENSG00000099194	SCD	stearoyl-CoA desaturase
ENSG00000188229	TUBB4B	tubulin β 4B class IVb
ENSG00000104177	MYEF2	myelin expression factor 2
ENSG00000130816	DNMT1	DNA methyltransferase 1
ENSG00000155324	GRAMD2B	GRAM domain containing 2B
ENSG00000291240	None	novel protein
ENSG00000305513	None	None
ENSG00000308783	None	None
ENSG00000307798	None	None
ENSG00000294711	None	None
ENSG00000302923	None	None
ENSG00000291113	None	novel transcript, antisense to PROP1

DEGs, differentially expressed genes; ZNF469, zinc finger 469.