

Technical Specifications

FoundationOne®RNA Assay for research use

FoundationOne®RNA is a next generation sequencing (NGS) hybrid capture assay for detection of somatic genomic alterations and enables gene expression reporting. The assay utilizes RNA isolated from formalin fixed paraffin embedded (FFPE) solid tumor tissue specimens. The assay is currently performed at the Cambridge, Massachusetts, site only.



Methods

- The assay is designed to capture genes known to be somatically altered in solid tumors that are validated targets for therapy, either approved or in clinical trials, and/or genes that are unambiguous drivers of oncogenesis based on current knowledge
- All submitted specimens are reviewed by a Foundation Medicine pathologist to ensure specimen viability and tumor content
- After pathologist review, DNA + RNA are coextracted from the sample
- Resulting RNA is processed using a hybrid capture-based NGS workflow and analysis pipeline to detect gene fusions and rearrangements

PERFORMANCE SPECIFICATIONS		
Accuracy: Gene Fusions*	Positive Percentage Agreement (PPA)	95.5%
Accuracy: Gene Fusions*	Negative Percentage Agreement (NPA)	99.9%
Accuracy: Gene Fusions and Rearrangements	Positive Percentage Agreement (PPA)	90.5%
Accuracy: Gene Fusions and Rearrangements	Negative Percentage Agreement (NPA)	99.9%
Precision: Gene Fusions*	Reproducibility	94.0%

* Orthogonal data derived from CAP/CLIA approved testing laboratories



Output

- Test results are provided in aggregate data sets curated by biomedical informatics scientists.
- For research use only. Aggregate data provided should not be used for clinical decision-making. **Current Gene List** →



Current Gene List

The following genes provide coverage to detect fusions related to RNA

<i>ABCB1</i>	<i>CD274</i>	<i>ERG</i>	<i>JAZF1</i>	<i>NF2</i>	<i>PTCH1</i>	<i>TEC</i>
<i>ABL1</i>	<i>CD28</i>	<i>ESR1</i>	<i>KAT6A</i>	<i>NIN</i>	<i>PTEN</i>	<i>TERT</i>
<i>ABL2</i>	<i>CD38</i>	<i>ETS1</i>	<i>KIF5B</i>	<i>NONO</i>	<i>RAF1</i>	<i>TET1</i>
<i>ACSL6</i>	<i>CD74</i>	<i>ETV1</i>	<i>KIT</i>	<i>NOTCH1</i>	<i>RARA</i>	<i>TET2</i>
<i>AFF1</i>	<i>CDH1</i>	<i>ETV4</i>	<i>KMT2A</i>	<i>NOTCH2</i>	<i>RASGRF1</i>	<i>TFE3</i>
<i>AFF4</i>	<i>CDK4</i>	<i>ETV5</i>	<i>LATS2</i>	<i>NOTCH3</i>	<i>RB1</i>	<i>TFEB</i>
<i>AKT1</i>	<i>CDK6</i>	<i>ETV6</i>	<i>LCP1</i>	<i>NOTCH4</i>	<i>RELA</i>	<i>TFG</i>
<i>AKT2</i>	<i>CDKN2A</i>	<i>EWSR1</i>	<i>LMNA</i>	<i>NPM1</i>	<i>RET</i>	<i>TFPT</i>
<i>AKT3</i>	<i>CDKN2B</i>	<i>FBXW7</i>	<i>LMO1</i>	<i>NR4A3</i>	<i>RHOH</i>	<i>THADA</i>
<i>ALK</i>	<i>CEBPA</i>	<i>FEV</i>	<i>LMO2</i>	<i>NRAS</i>	<i>ROS1</i>	<i>TLX1</i>
<i>APC</i>	<i>CIC</i>	<i>FGFR1</i>	<i>LPP</i>	<i>NRG1</i>	<i>RPS6KB1</i>	<i>TLX3</i>
<i>AR</i>	<i>CIITA</i>	<i>FGFR10P</i>	<i>LTK</i>	<i>NRG2</i>	<i>RSPO2</i>	<i>TMPRSS2</i>
<i>ARHGAP26</i>	<i>CLDN18</i>	<i>FGFR2</i>	<i>MAF</i>	<i>NSD1</i>	<i>RSPO3</i>	<i>TOP1</i>
<i>ARHGDI1A</i>	<i>CLDN3</i>	<i>FGFR3</i>	<i>MAFB</i>	<i>NTRK1</i>	<i>RUNX1</i>	<i>TP53</i>
<i>ARID1A</i>	<i>CLTC</i>	<i>FGFR4</i>	<i>MALT1</i>	<i>NTRK2</i>	<i>RUNX1T1</i>	<i>TP63</i>
<i>ARID1B</i>	<i>CNTRL</i>	<i>FGR</i>	<i>MAML2</i>	<i>NTRK3</i>	<i>SDHA</i>	<i>TPM3</i>
<i>ASXL1</i>	<i>COL1A1</i>	<i>FLI1</i>	<i>MAP3K7</i>	<i>NUMA1</i>	<i>SDHB</i>	<i>TPM4</i>
<i>ATIC</i>	<i>CREB3L1</i>	<i>FLT3</i>	<i>MAP3K8</i>	<i>NUP214</i>	<i>SDHC</i>	<i>TRIM24</i>
<i>ATM</i>	<i>CREB3L2</i>	<i>FOS</i>	<i>MAST1</i>	<i>NUP98</i>	<i>SDHD</i>	<i>TRIP11</i>
<i>ATR</i>	<i>CREBBP</i>	<i>FOSB</i>	<i>MDS2</i>	<i>NUTM1</i>	<i>SEC31A</i>	<i>TSC1</i>
<i>AXL</i>	<i>CRLF2</i>	<i>FOXO1</i>	<i>MECOM</i>	<i>NUTM2A</i>	<i>SEPT5</i>	<i>TSC2</i>
<i>B2M</i>	<i>CSF1</i>	<i>FOXO3</i>	<i>MEF2C</i>	<i>P2RY8</i>	<i>SEPT6</i>	<i>TTL</i>
<i>BAP1</i>	<i>CUX1</i>	<i>FOXO4</i>	<i>MEF2D</i>	<i>PALB2</i>	<i>SEPT7</i>	<i>TYK2</i>
<i>BCL10</i>	<i>CXCR4</i>	<i>FOXP1</i>	<i>MEN1</i>	<i>PAX3</i>	<i>SET</i>	<i>USP6</i>
<i>BCL11B</i>	<i>CYLD</i>	<i>FUS</i>	<i>MET</i>	<i>PAX5</i>	<i>SH3GL1</i>	<i>VHL</i>
<i>BCL2</i>	<i>DDIT3</i>	<i>GAS7</i>	<i>MGMT</i>	<i>PAX7</i>	<i>SLC45A3</i>	<i>WHSC1</i>
<i>BCL3</i>	<i>DDR1</i>	<i>GLI1</i>	<i>MKL1</i>	<i>PBX1</i>	<i>SMAD2</i>	<i>WHSC1L1</i>
<i>BCL6</i>	<i>DDR2</i>	<i>GLIS2</i>	<i>MKL2</i>	<i>PBX3</i>	<i>SMAD4</i>	<i>WT1</i>
<i>BCOR</i>	<i>DDX10</i>	<i>HDAC10</i>	<i>MLF1</i>	<i>PDCD1LG2</i>	<i>SMARCB1</i>	<i>WWTR1</i>
<i>BCR</i>	<i>DEK</i>	<i>HERPUD1</i>	<i>MLH1</i>	<i>PDGFB</i>	<i>SNX29</i>	<i>YAP1</i>
<i>BRAF</i>	<i>DHH</i>	<i>HEY1</i>	<i>MLLT1</i>	<i>PDGFD</i>	<i>SRC</i>	<i>YWHAE</i>
<i>BRCA1</i>	<i>DIRC2</i>	<i>HIP1</i>	<i>MLLT10</i>	<i>PDGFRA</i>	<i>SS18</i>	<i>ZAP70</i>
<i>BRCA2</i>	<i>DLC1</i>	<i>HLF</i>	<i>MN1</i>	<i>PDGFRB</i>	<i>SSX1</i>	<i>ZBTB16</i>
<i>BRD3</i>	<i>DNMT3A</i>	<i>HMGA1</i>	<i>MNX1</i>	<i>PHF1</i>	<i>SSX2</i>	<i>ZMYM2</i>
<i>BRD4</i>	<i>DUSP22</i>	<i>HMGA2</i>	<i>MSH2</i>	<i>PICALM</i>	<i>SSX4</i>	<i>ZNF384</i>
<i>BRIP1</i>	<i>EBF1</i>	<i>IGH</i>	<i>MSH6</i>	<i>PIK3CA</i>	<i>STAT6</i>	<i>ZNF750</i>
<i>BTG1</i>	<i>EGFR</i>	<i>IGK</i>	<i>MSI2</i>	<i>PIK3R1</i>	<i>STIL</i>	
<i>BTK</i>	<i>EIF4A2</i>	<i>IGLL5</i>	<i>MSMB</i>	<i>PIK3R2</i>	<i>STK11</i>	
<i>CAMTA1</i>	<i>ELF4</i>	<i>IKZF1</i>	<i>MTAP</i>	<i>PKN1</i>	<i>SYK</i>	
<i>CBFA2T3</i>	<i>ELL</i>	<i>IKZF2</i>	<i>MTCP1</i>	<i>PLAG1</i>	<i>TAF15</i>	
<i>CBFB</i>	<i>ELN</i>	<i>IKZF3</i>	<i>MYB</i>	<i>PMS2</i>	<i>TAL1</i>	
<i>CBL</i>	<i>EML4</i>	<i>INSR</i>	<i>MYC</i>	<i>PPARG</i>	<i>TAL2</i>	
<i>CCND1</i>	<i>EP300</i>	<i>IRF4</i>	<i>MYH11</i>	<i>PRDM16</i>	<i>TBL1XR1</i>	
<i>CCND2</i>	<i>EPOR</i>	<i>ITK</i>	<i>NAB2</i>	<i>PRKACA</i>	<i>TCF3</i>	
<i>CCND3</i>	<i>EPS15</i>	<i>JAK1</i>	<i>NBEAP1</i>	<i>PRKCA</i>	<i>TCF4</i>	
<i>CCNE1</i>	<i>ERBB2</i>	<i>JAK2</i>	<i>NCOA2</i>	<i>PRKCB</i>	<i>TCL1A</i>	
<i>CD19</i>	<i>ERBB3</i>	<i>JAK3</i>	<i>NF1</i>	<i>PRMT5</i>	<i>TCL6</i>	

The following genes are for use in gene expression reporting

A2M	AURKA	CCL13	CDHR1	CT45A3	EGFR				
ABCA6	AURKB	CCL14	CDK2	CTG2	EGLN3	FNIP2	HDAC8		
ABCB1	AVPR1A	CCL17	CDK4	CTAG1A	EGR1	FOLH1	HDAC9	IL16	
ABCC2	AXIN2	CCL18	CDK6	CTAG1B	EGR2	FOLR1	HDC	IL17RA	
ABCC9	AXL	CCL19	CDK8	CTAG2	EIF4A2	FOS	HELZ2	IL1A	
ABI1	B2M	CCL2	CDKN1A	CTAGE1	ELF4	FOSB	HERPUD1	IL1B	
ABL1	B3GNT5	CCL20	CDKN1B	CTGF	ELF5	FOXA1	HES1	IL1R1	
ABL2	BAALC	CCL21	CDKN1C	CTLA4	ELK4	FOXC1	HES2	IL1RN	
ACACA	BAG1	CCL3	CDKN2A	CTNNB1	ELL	FOXM1	HES4	IL21R	
ACLY	BAG2	CCL4	CDKN2AIP	CTNNBIP1	ELN	FOXO1	HES5	IL23A	
ACRBP	BAGE4	CCL5	CDKN2B	CTPS1	EMCN	FOXO3	HES6	IL2RA	
ACSL3	BAK1	CCL8	CDKN2B-AS1	CTPS2	EME1	FOXO4	HEY1	IL3	
ACSL6	BAMBI	CCL2	CDKN2D	CTSV	EML4	FOXO6	HEY2	IL33	
ACTA2	BAP1	CENB1	CDKN3	CTSW	EML6	FOXP1	HEYL	IL3RA	
ACTG1	BASP1	CCNB2	CDT1	CUX1	EMSY	FOXP3	HGF	IL4R IL6	
ACTG2	BATF	CEND1	CDX2	CX3CL1	ENTPD1	FPR1	HHIP	IL6R	
ACTN1	BATF3	CCND2	CEACAM1	CXCL1	EOMES	FPR3	HIF1A	IL6ST	
ACTR3B	BAX	CCND3	CEACAM3	CXCL10	EP300	FSTL3	HIP1	IL7	
ACVR1	BAZ2B	CCNE1	CEACAM5	CXCL11	EP400	FUCA1	HIST1H1A	IL7R	
ACVR1C	BCAM	CCNE2	CEACAM8	CXCL12	EPCAM	FUS	HIST1H1E	IMPDH1	
ACVRL1	BCAR1	CCNG2	CEBPA	CXCL13	EPHA4	FUT4	HIST1H2AG	INPP1	
ADAM12	BCAR3	CCR4	CEBPB	CCR4	EPHA7	FUT8	HIST1H2AI	INSR	
ADAM19	BCAS1	CCR5	CELSR2	CXCL3	EPOR	FZD1	HIST1H2BL	INSRR	
ADAM7	BCL10	CCR7	CENPA	CXCL6	EPS15	FZD10	HIST1H3B	IPO8	
ADCY7	BCL11A	CCR8	CENPF	CXCL8	ERAP1	FZD2	HIST2H2BF	IQGAP3	
ADGRB1	BCL11B	CCRL2	CENPM	CXCL9	ERAP2	FZD5	HLA-A	IRF1	
ADGRB3	BCL2	CCSER2	CEP55	CXCR1	ERBB2	FZD6	HLA-B	IRF4	
ADGRF5	BCL2A1	CD14	CES1	CXCR2	ERBB3	FZD7	HLA-C	IRF7	
ADGRL4	BCL2L1	CD163	CES2	CXCR4	ERCC1	GABBR2	HLA-DMA	IRF8	
ADRB2	BCL2L11	CD19	CFD	CXCR5	ERCC2	GADD45A	HLA-DMB	IRGM	
AFF1	BCL3	CD1A	CHAF1B	CXCR6	ERCC3	GADD45B	HLA-DOA	IRS2	
AFF3	BCL6	CD1B	CHEK1	CXXC5	ERCC4	GAGE1	HLA-DQB	IRX4	
AFF4	BCL7A	CD1D	CHEK2	CYB5R2	ERCC5	GAGE2E	HLA-DQA1	ISG20	
AFP	BCL9	CD1E	CHN1	CYBB	EREG	GAGE6	HLA-DQB1	ISY1	
AGR2	BCOR	CD2	CHUK	CYLD	ERG	GAGE8	HLA-DRA	ITGAM	
AGR3	BCR	CD209	CIC	CYP4F3	ERN2	GALNT10	HLA-DRB1	ITGAV	
AHR	BIN2	CD22	CIITA	DCAF12	ESM1	GALNT12	HLA-E	ITGAX	
AIFM3	BIRC3	CD226	CITED4	DCLK1	ESR1	GAS1	HLF	ITGB1	
AKT1	BIRC5	CD244	CLCA2	DCN	ETS1	GAS7	HMGA1	ITGB2	
AKT2	BLK	CD247	CLDN18	DB2	ETV1	GBP5	HMGA2	ITGB4	
AKT3	BLM	CD248	CLDN3	DDIT3	ETV4	GIMAP5	HMGCS2	ITK	
ALDH2	BLNK	CD27	CLDN4	DDIT4	ETV5	GIMAP7	HMMR	ITM2A	
ALK	BLVRA	CD274	CLDN5	DDR1	ETV6	GINS2	HOPX	ITPKB	
ALOX12	BMF	CD276	CLDN6	DDR2	EWSR1	GJA4	HORMAD1	JAK1	
AMER1	BMP2	CD28	CLDN7	DDX10	EXO1	GLI1	HOXA11	JAK2	
AMZ1	BMP4	CD33	CLEC10A	DDX21	EZH2	GLIS2	HOXB2	JAK3	
ANGPT1	BMPR1A	CD34	CLEC14A	DDX4	F11R	GMFG	HPCAL1	JAML	
ANGPT2	BMPR1B	CD36	CLEC4C	DDX58	FAM101B	GMN	HRAS	JAZF1	
ANLN	BNC2	CD38	CLECSA	DDX6	FAM171B	GMP5	HRASL5	JUN	
ANPEP	BRAF	CD3D	CLEC9A	DEK	FAM26F	GNA12	HSD11B1	KAT6A	
ANXA1	BRCA1	CD3E	CLIC2	DENND3	FAM46A	GNG11	HSP90AA1	KCNE3	
ANXA2	BRCA2	CD3G	CLIC4	DEPTOR	FAM64A	GNLV	HSP90AB1	KCNJ15	
APC	BRD3	CD4	CLTC	DHH	FANCA	GOLM1	HSPA4L	KCNK5	
APCDD1	BRD4	CD40	CMKLR1	DHX58	FANCB	GPA33	HSPB1	KCNMA1	
APEX2	BRDT	CD40LG	CMPK2	DIDO1	FANCC	GPC4	ICAM1	KDM1A	
APH1A	BRINP3	CD44	CNN1	DIRC2	FANCD2	GPC6	ICAM2	KDM3B	
APLN	BRIP1	CD46	CNTNAP2	DKK1	FAP	GPI	ICOS	KDM4C	
APOBEC3A	BRPF1	CD47	CNTRL	DKK2	FAS	GPR143	ID1	KDM5C	
APOBEC3B	BTG1	CD5	COL15A1	DKK4	FASN	GPR146	ID2	KDM5D	
APOBR	BTG3	CD6	COL18A1	DLC1	FAT2	GPR160	IDO1	KDR	
APOL6	BTK	CD63	COL1A1	DLL3	FBXW11	GRB7	IFI16	KDSR	
APP	BTLA	CD68	COL1A2	DLL4	FBXW7	GREB1	IFI27	KIAA0040	
APPPB2	BUB1	CD7	COL3A1	DMBT1	FCAR	GRM4	IFI35	KIAA0125	
AR	BUB1B	CD70	COL4A1	DMD	FCGR2B	GSK3B	IFI6	KIAA0319L	
AREG	C10orf35	CD74	COL4A2	DNMT1	FCGR3B	GSTA1	IFIT1	KIAA1462	
ARF1	C15orf48	CD79A	COL6A3	DNMT3A	FCRL2	GSTM1	IFIT2	KIAA1804	
ARG2	C1RL	CD79B	COL7A1	DOCK5	FCRL5	GUSB	IFIT3	KIF13B	
ARHGAP15	C3 CS	CD80	COPB2	DOT1L	FEV	GZMA	IFITM2	KIF23	
ARHGAP26	CSAR2	CD81	CPA3	DRAM1	FGF9	GZMB	IFITM3	KIF2B	
ARHGDI1A	CA4	CD84 C	CRAF	DSC2	FGFBP2	GZMH	IFNG	KIF2C	
ARID1A	CAGE1	D86	CREB1	DSCR8	FGFR1	GZMK	IFNL2	KIF5B	
ARID1B	CALB2	CD8A	CREB3L1	DTL	FGFR10P	H2AFX	IGF1	KIFC1	
ARID3A	CALML3	CD8B	CREB3L2	DTX1	FGFR2	HABP2	IGF1R	KIR2DL1	
ARNT	CALR	CD9	CREBBP	DTX2	FGFR3	HAMP	IGFBP1	KIR2DL3	
ARNT2	CAMTA1	CD93	CRKL	DTX3L	FGFR4	HAP1	IGFBP3	KIR3DL1	
ASAP2	CANX	CD96	CRLF2	DUSP1	FGR	HAVCR2	IGFBP4	KIR3DL2	
ASB13	CASP1	CD100	CRNDE	DUSP18	FKBP4	HBEGF	IGLL5	KIR3DS1	
ASCL2	CASP3	CD105	CRYAB	DUSP22	FLI1	HCLS1	IHH	KIT	
ASGR2	CASP8	CD106	CSF1	DUSP6	FLNA	HCST	IKBKE	KLF2	
ASTE1	CASP9	CD107	CSF1R	DVL1	FLT1	HDAC1	IKZF1	KLF4	
ASXL1	CBFA2T3	CD108	CSF2	E2F1	FLT3	HDAC10	IKZF2	KLK3	
ATAD2	CBFB	CD109	CSF3R	E2F4	FLT3LG	HDAC11	IKZF3	KLRB1	
ATIC	CBL	CD110	CSMD1	E2F5	FLT4	HDAC2	IL10	KLRC3	
ATM	CBLC	CD111	CSNK1E	EBF1	FMN1	HDAC3	IL11	KLRC4	
ATP2C1	CCDC140	CD112	CSNK1G2	ECSCR	FMN2	HDAC4	IL12A	KLRD1	
ATP8A1	CCDC50	CD113	CST7	ECT2	FMOD	HDAC5	IL13	KLRK1	
ATP8B2	CCL11	CDH3	CT45A1	EDNRB	FN1	HDAC6	IL13RA2	KMT2A	
ATR		CDH5	CT45A2	EGF	FNBP1	HDAC7	IL15	KMT2C	

FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.

KMT2D	MAP2	MX2	OLFM4	PRKCB	RORA	SLC7A8	TCL1A	TREM2
KMT5A	MAP2K1	MYB	OLIG2	PRMT1	RORC	SLC9A3R1	TCL6	TREX1
KRAS	MAP2K3	MYBL2	ORAI2	PRMT5	ROS1	SLCO2A1	TDG	TRIM2
KRT14	MAP3K7	MYC	ORC6	PRND	RP1	SLFN11	TDFG1	TRIM24
KRT17	MAP3K8	MYCL	P2RY8	PROM1	RPL23	SLIT2	TDRD7	TRIM56
KRT31	MAP4K4	MYCN	PADI2	PRPF6	RPL39L	SMAD2	TEAD1	TRIP11
KRT5	MAPK1	MYCT1	PAFAH1B2	PRPF8	RPS26	SMAD3	TEC	TRPS1
KRT6A	MAPK3	MYD88	PAGE5	PSAT1	RPS6KA1	SMAD4	TEK	TSC1
KRTCAP3	MAPKAPK2	MYH11	PAK2	PSCA	RPS6KB1	SMAD9	TENM3	TSC2
KYNU	MAPT	MYH9	PAK4	PSD3	RPSAP52	SMARCB1	TERC	TSHR
LAG3	MARK1	NAB2	PALB2	PSENE1	RRAGC	SMURF2	TERT	TTC39B
LAIR1	MASP2	NAT1	PAMR1	PSIP1	RRAS	SNAI1	TE11	TTK
LAMB1	MAST1	NAV3	PARP1	PSMB10	RRM2	SNRNP70	TET2	TTL
LASP1	MAST2	NBEA	PARP12	PSMB8	RSAD2	SNW1	TET3	TTYT14
LATS1	MASTL	NBEAP1	PARP14	PSMB9	RSPO2	SNX29	TFCP2L1	TTYH1
LATS2	MB21D1	NBN	PAX3	PSME1	RSPO3	SOC3	TFE3	TWIST1
LCK	MBTD1	NCAM1	PAX5	PTCH1	RUNX1	SOS1	TFEB	TYK2
LCN2	MCAM	NCOA2	PAX7	PTCH2	RUNX1T1	SOS2	TFE1	TYMS
LCP1	MCL1	NCOR1	PAX8	PTCRA	RUNX2	SOX11	TFG	UBA7
LDHB	MCM10	NCR1	PBK	PTEN	RUNX3	SOX17	TFPT	UBE2C
LEF1	MCM2	NDC80	PBX1	PTGDS	S100A12	SOX18	TFRC	UBE2T
LGALS2	MCM4	NDE1	PBX3	PTGER2	S100A8	SOX9	TGFB1	UBXN4
LGALS3	MCM6	NDRG1	PCDH17	PTGER4	S1PR2	SP2	TGFB2	UGT8
LILRB5	MDC1	NEAT1	PCSK1	PTGS2	SA1	SPANXA1	TGFB3	UNC5B
LIMD1	MDM2	NECTIN1	PDCD1	PTPN1	SAGE1	SPANXB1	TGFB1	UPK1A
LIMK2	MDS2	NECTIN2	PDCD1LG2	PTPN11	SAMD9L	SPANXC	TGFB1	UPP1
LINC-ROR	MECOM	NECTIN3	PDGFA	PTPN22	SAP30	SPARC	TGFB2	USP44
LINC00598	MEF2C	NEK1	PDGFB	PTPRB	SCD	SPARCL1	THADA	USP6
LIPH	MEF2D	NEK2	PDGFD	PTPRC	SCD5	SPIB	THBD	USP8
LIP1	MEG3	NEK6	PDGFRA	PTPRK	SCML4	SPINK1	THBS1	VAV3
LMNA	MEGF9	NELL2	PDGFRB	PTPRO	SCUBE2	SPN	THY1	VCAM1
LMO1	MELK	NF1	PDIA3	PTPRZ1	SDC1	SPP1	TIAM1	VCL
LMO2 LMO3	MEN1	NF2	PDZK1IP1	PTRF	SDHA	SPRY4	TI1	VEGFA
LMO4	MEST	NFATC2	PECAM1	PTTG1	SDHB	SRC	TIGIT	VEGFB
LOC100506207	MET	NFE2L2	PFN2	PUM1	SDHC	SRD5A1	TIMP3	VEGFC
LOC100507346	METRNL	NFIC	PGR	PVR	SDHD	SREBF1	TL1	VGLL1
LOC100507424	MFAP4	NFKB2	PHF1	PVRIG	SEC31A	SRSF3	TLR2	VHL
LPP	MFAP5	NID2	PHF11	PXDC1	SELL	SS18	TLR3	VIM
LRMP	MGA	NIN	PHGDH	R3HDM1	SELP	SSPO	TLX1	VNN3
LRP1	MGMT	NKD1	PHLPP1	RAB23	SEMA3E	SSX1	TLX3	VPREB1
LRP8	MGST2	NRG7	PICALM	RAB27A	SEMA4B	SSX2	TMEM173	VWF
LRRC15	MIA	NKX3-1	PIK3CA	RAB29	SEMA4C	SSX2B	TMEM38A	WASH5P
LTF	MIAT	NLK	PIK3CD	RAC1	SEMA6D	SSX3	TMEM45B	WBSCR17
LTK	MICB	NONO	PIK3CG	RAD50	SEMA7A	SSX4	TMEM55B	WHSC1
LUZP4	MIR100	NOS1	PIK3R1	RAD51	SEPT5	SSX5	TMPPRS2	WHSC1L1
LY6E	MIF	NOS1AP	PIK3R2	RAD51AP1	SEPT6	ST3GAL2	TNF	WIF1
LY6G6D	MKI67	NOTCH1	PIM2	RAD51B	SEPT9	STAT1	TNFRSF10C	WNT11
LYL1	MKL1	NOTCH2	PIM3	RAD51C	SEPT12	STAT3	TNFRSF11A	WNT16
LZTR1	MKL2	NOTCH3	PKN1	RAD51D	SEPW1	STAT4	TNFRSF14	WNT2
MACC1	MLF1	NOTCH4	PLA2G7	RAD52	SERPINA9	STAT6	TNFRSF17	WNT5B
MAF	MLH1	NPAS2	PLAC8	RAD54L	SERPINB13	STAU2	TNFRSF1A	WNT7A
MAFB	MLLT1	NPM1	PLAG1	RAF1	SERPINB2	STEAP1	TNFRSF1B	WNT7B
MAGEA1	MLLT10	NR4A3	PLAGL2	RAPGEFL1	SERPINB5	STEAP4	TNFRSF25	WNT8B
MAGEA10	MLPH	NRAP	PLCB4	RARA	SERPINE1	STIL	TNFRSF8	WT1
MAGEA11	MME	NRARP	PLEK2	RASGRF1	SERPINF1	STK11	TNFRSF9	WWTR1
MAGEA12	MMMP11	NRAS	PLEKH4A	RASIP1	SESN1	STON1	TNFSF10	XCL1
MAGEA2B	MN1	NRG1	PLEKHB1	RASSF6	SESN2	SULF2	TNFSF11	XCL2
MAGEA3	MNX1	NRG2	PLK2	RB1	SESN3	SULT1A1	TNFSF12	XIST
MAGEA4	MOCOS	NRP1	PLPP3	RBL1	SET	SUV39H2	TNFSF13B	XPA
MAGEA5	MPZL3	NRP2	PLVAP	RBM24	SFB1	SYCP1	TNFSF4	XPO1
MAGEA6	MRA5	NRTN	PMEPA1	RBP7	SFRP1	SYCP3	TNFSF9	YAP1
MAGEA8	MRE11A	NSD1	PML	RBX1	SGK3	SYK	TNKS	YWHAE
MAGEA9B	MRV1	NTSC3A	PMS1	RECQL4	SH2D1A	TACSTD2	TNKS2	YY1
MAGEB1	MS4A1	NTSE	PMS2	REGA	SH2D1B	TAF15	TNS1	ZAP70
MAGEB10	MS4A2	NTRK1	PNOC	RELA	SH2D2A	TAGAP	TOP1	ZBP1
MAGEB16	MS4A4A	NTRK2	PNPLA7	RERG	SH3BP5	TAGLN	TOP2A	ZBTB16
MAGEB17	MSH2	NTRK3	PODXL	RET	SH3GL1	TAL1	TP53	ZBTB46
MAGEB18	MSH6	NUF2	POLD1	RGCC	SH3PXD2A	TAL2	TP53BP1	ZC3H13
MAGEB2	MSI2	NUMA1	POLE	RGS10	SHCBP1	TAP1	TP53INP1	ZC3HAV1
MAGEB3	MSMB	NUMBL	POU2F2	RGS16	SHISA5	TAP2	TP53INP2	ZEB1
MAGEB4	MSN	NUP214	POUSF1	RGS2	SHISA8	TAPBP	TP63	ZEB2
MAGEB5	MST1R	NUP98	PPARG	RHOA	SHOC2	TBC1D10C	TP73	ZIC2
MAGEB6	MTAP	NUTM1	PPM1J	RHOH	SIGLECS	TBC1D4	TPM1	ZMAT3
MAGEC1	MTCP1	NUTM2A	PPP1R13L	RHOJ	SKP1	TBC1D9	TPM2	ZMYM2
MAGEC2	MTHFD1L	NXF2B	PRDM15	RIT1	SLAMF1	TBL1XR1	TPM3	ZNF384
MAGEC3	MTOR	NXPX3	PRDM16	RNF13	SLC16A3	TBX21	TPM4	ZNF521
MALAT1	MUC1	OAS3	PRF1	ROBO4	SLC1A2	TCF12	TPSAB1	ZNF608
MALT1	MUC16	OASL	PRKACA	ROCK2	SLC22A8	TCF3	TPSB2	ZNF703
MAML2	MUTYH	ODC1	PRKACB	ROPN1	SLC39A6	TCF4	TPST1	ZNF750
MAML3	MVP	OGN	PRKACG	ROPN1B	SLC40A1	TCF7L1	TPX2	ZNRF3
	MX1	OLFM1	PRKCA	ROR1	SLC45A3	TCF7L2	TRAT1	

