

Table S1 50 cancer-related gene list in this study

Symbol	Approved name	HGNC ID	Location
<i>ALK</i>	ALK receptor tyrosine kinase	427	2p23.2-p23.1
<i>HRAS</i>	HRas proto-oncogene, GTPase	5173	11p15.5
<i>MET</i>	MET proto-oncogene, receptor tyrosine kinase	7029	7q31
<i>KDR</i>	kinase insert domain receptor	6307	4q12
<i>APC</i>	APC regulator of WNT signaling pathway	583	5q22.2
<i>JAK2</i>	Janus kinase 2	6192	9p24.1
<i>ERBB2</i>	erb-b2 receptor tyrosine kinase 2	3430	17q12
<i>SRC</i>	SRC proto-oncogene, non-receptor tyrosine kinase	11283	20q11.23
<i>JAK3</i>	Janus kinase 3	6193	19p13.11
<i>ERBB4</i>	erb-b2 receptor tyrosine kinase 4	3432	2q34
<i>RET</i>	ret proto-oncogene	9967	10q11.21
<i>AKT1</i>	AKT serine/threonine kinase 1	391	14q32.33
<i>GNAQ</i>	G protein subunit alpha q	4390	9q21.2
<i>FBXW7</i>	F-box and WD repeat domain containing 7	16712	4q31.3
<i>GNAS</i>	GNAS complex locus	4392	20q13.32
<i>IDH1</i>	isocitrate dehydrogenase (NADP(+)) 1, cytosolic	5382	2q34
<i>ATM</i>	ATM serine/threonine kinase	795	11q22.3
<i>IDH2</i>	isocitrate dehydrogenase (NADP(+)) 2, mitochondrial	5383	15q26.1
<i>SMAD4</i>	SMAD family member 4	6770	18q21.2
<i>NRAS</i>	NRAS proto-oncogene, GTPase	7989	1p13.2
<i>RB1</i>	RB transcriptional corepressor 1	9884	13q14.2
<i>MLH1</i>	mutL homolog 1	7127	3p22.2
<i>PDGFRA</i>	platelet derived growth factor receptor alpha	8803	4q12
<i>SMARCB1</i>	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily b, member 1	11103	22q11.23
<i>PIK3CA</i>	phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha	8975	3q26.32
<i>TP53</i>	tumor protein p53	11998	17p13.1
<i>SMO</i>	smoothened, frizzled class receptor	11119	7q32.1
<i>VHL</i>	von Hippel-Lindau tumor suppressor	12687	3p25.3
<i>PTEN</i>	phosphatase and tensin homolog	9588	10q23.31
<i>STK11</i>	serine/threonine kinase 11	11389	19p13.3
<i>NOTCH1</i>	notch receptor 1	7881	9q34.3
<i>GNA11</i>	G protein subunit alpha 11	4379	19p13.3
<i>CTNNB1</i>	catenin beta 1	2514	3p22.1
<i>EZH2</i>	enhancer of zeste 2 polycomb repressive complex 2 subunit	3527	7q36.1

Table S1 (continued)

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Symbol	Approved name	HGNC ID	Location
<i>BRAF</i>	B-Raf proto-oncogene, serine/threonine kinase	1097	7q34
<i>EGFR</i>	epidermal growth factor receptor	3236	7p11.2
<i>PTPN11</i>	protein tyrosine phosphatase non-receptor type 11	9644	12q24.13
<i>KIT</i>	KIT proto-oncogene, receptor tyrosine kinase	6342	4q12
<i>KRAS</i>	KRAS proto-oncogene, GTPase	6407	12p12.1
<i>CDKN2A</i>	cyclin dependent kinase inhibitor 2A	1787	9p21.3
<i>MPL</i>	MPL proto-oncogene, thrombopoietin receptor	7217	1p34.2
<i>FLT3</i>	fms related tyrosine kinase 3	3765	13q12.2
<i>NPM1</i>	nucleophosmin 1	7910	5q35.1
<i>FGFR1</i>	fibroblast growth factor receptor 1	3688	8p11.23
<i>FGFR2</i>	fibroblast growth factor receptor 2	3689	10q26.13
<i>FGFR3</i>	fibroblast growth factor receptor 3	3690	4p16.3
<i>CSF1R</i>	colony stimulating factor 1 receptor	2433	5q32
<i>CDH1</i>	cadherin 1	1748	16q22.1
<i>ABL1</i>	ABL proto-oncogene 1, non-receptor tyrosine kinase	76	9q34.12
<i>HNF1A</i>	HNF1 homeobox A	11621	12q24.31