

**S2 Table.** Panel gene list

<b>HGNC id</b>	<b>Approved name</b>	<b>Location</b>	<b>Gene symbol</b>	<b>SNV/INDEL</b>	<b>Fusion</b>	<b>CNV</b>
HGNC:76	ABL proto-oncogene 1, non-receptor tyrosine kinase	9q34.12	<i>ABL1</i>	O		O
HGNC:391	AKT serine/threonine kinase 1	14q32.33	<i>AKT1</i>	O		O
HGNC:392	AKT serine/threonine kinase 2	19q13.2	<i>AKT2</i>	O		O
HGNC:427	ALK receptor tyrosine kinase	2p23.2-p23.1	<i>ALK</i>	O	O	O
HGNC:583	APC regulator of WNT signaling pathway	5q22.2	<i>APC</i>	O		O
HGNC:644	Androgen receptor	Xq12	<i>AR</i>	O		O
HGNC:646	A-Raf proto-oncogene, serine/threonine kinase	Xp11.3	<i>ARAF</i>	O		O
HGNC:11110	AT-rich interaction domain 1A	1p36.11	<i>ARID1A</i>	O		O
HGNC:795	ATM serine/threonine kinase	11q22.3	<i>ATM</i>	O		O
HGNC:1014	BCR activator of RhoGEF and GTPase	22q11.23	<i>BCR</i>		O	
HGNC:1097	B-Raf proto-oncogene, serine/threonine kinase	7q34	<i>BRAF</i>	O	O	O
HGNC:1100	BRCA1 DNA repair associated	17q21.31	<i>BRCA1</i>	O		O
HGNC:1101	BRCA2 DNA repair associated	13q13.1	<i>BRCA2</i>	O		O
HGNC:1133	Bruton tyrosine kinase	Xq22.1	<i>BTK</i>	O		O
HGNC:1541	Cbl proto-oncogene	11q23.3	<i>CBL</i>	O		O
HGNC:1582	Cyclin D1	11q13.3	<i>CCND1</i>	O		O
HGNC:1583	Cyclin D2	12p13.32	<i>CCND2</i>	O		O
HGNC:1589	Cyclin E1	19q12	<i>CCNE1</i>	O		O
HGNC:17635	CD274 molecule	9p24.1	<i>CD274</i>	O		O
HGNC:1748	Cadherin 1	16q22.1	<i>CDH1</i>	O		O
HGNC:1773	Cyclin dependent kinase 4	12q14.1	<i>CDK4</i>	O		O
HGNC:1777	Cyclin dependent kinase 6	7q21.2	<i>CDK6</i>	O		O

HGNC:1787	Cyclin dependent kinase inhibitor 2A	9p21.3	<i>CDKN2A</i>	O		O
HGNC:1833	CCAAT enhancer binding protein alpha	19q13.11	<i>CEBPA</i>	O		O
HGNC:2433	Colony stimulating factor 1 receptor	5q32	<i>CSF1R</i>	O		O
HGNC:2514	Catenin beta 1	3p22.1	<i>CTNNB1</i>	O		O
HGNC:2731	Discoidin domain receptor tyrosine kinase 2	1q23.3	<i>DDR2</i>	O		O
HGNC:3012	Dihydropyrimidine dehydrogenase	1p21.3	<i>DPYD</i>	O		O
HGNC:3236	Epidermal growth factor receptor	7p11.2	<i>EGFR</i>	O	O	O
HGNC:3430	Erb-b2 receptor tyrosine kinase 2	17q12	<i>ERBB2</i>	O		O
HGNC:3431	Erb-b2 receptor tyrosine kinase 3	12q13.2	<i>ERBB3</i>	O		O
HGNC:3467	Estrogen receptor 1	6q25.1-q25.2	<i>ESR1</i>	O		O
HGNC:16712	F-box and WD repeat domain containing 7	4q31.3	<i>FBXW7</i>	O		O
HGNC:3688	Fibroblast growth factor receptor 1	8p11.23	<i>FGFR1</i>	O		O
HGNC:3689	Fibroblast growth factor receptor 2	10q26.13	<i>FGFR2</i>	O	O	O
HGNC:3690	Fibroblast growth factor receptor 3	4p16.3	<i>FGFR3</i>	O	O	O
HGNC:3765	Fms related receptor tyrosine kinase 3	13q12.2	<i>FLT3</i>	O		O
HGNC:4172	GATA binding protein 3	10p14	<i>GATA3</i>	O		O
HGNC:4379	G protein subunit alpha 11	19p13.3	<i>GNAI1</i>	O		O
HGNC:4390	G protein subunit alpha q	9q21.2	<i>GNAQ</i>	O		O
HGNC:4392	GNAS complex locus	20q13.32	<i>GNAS</i>	O		O
HGNC:5173	HRas proto-oncogene, GTPase	11p15.5	<i>HRAS</i>	O		O
HGNC:5382	Isocitrate dehydrogenase (NADP(+)) 1	2q34	<i>IDH1</i>	O		O
HGNC:5383	Isocitrate dehydrogenase (NADP(+)) 2	15q26.1	<i>IDH2</i>	O		O
HGNC:5465	Insulin like growth factor 1 receptor	15q26.3	<i>IGF1R</i>	O		O
HGNC:6192	Janus kinase 2	9p24.1	<i>JAK2</i>	O		O

HGNC:6193	Janus kinase 3	19p13.11	<i>JAK3</i>	O	O
HGNC:12637	lysine demethylase 6A	Xp11.3	<i>KDM6A</i>	O	O
HGNC:6307	kinase insert domain receptor	4q12	<i>KDR</i>	O	O
HGNC:23177	kelch like ECH associated protein 1	19p13.2	<i>KEAP1</i>	O	O
HGNC:6342	KIT proto-oncogene, receptor tyrosine kinase	4q12	<i>KIT</i>	O	O
HGNC:6407	KRAS proto-oncogene, GTPase	12p12.1	<i>KRAS</i>	O	O
HGNC:6840	Mitogen-activated protein kinase kinase 1	15q22.31	<i>MAP2K1</i>	O	O
HGNC:6842	Mitogen-activated protein kinase kinase 2	19p13.3	<i>MAP2K2</i>	O	O
HGNC:6871	Mitogen-activated protein kinase 1	22q11.22	<i>MAPK1</i>	O	O
HGNC:6877	Mitogen-activated protein kinase 3	16p11.2	<i>MAPK3</i>	O	O
HGNC:6973	MDM2 proto-oncogene	12q15	<i>MDM2</i>	O	O
HGNC:7029	MET proto-oncogene, receptor tyrosine kinase	7q31	<i>MET</i>	O	O
HGNC:7127	Mutl homolog 1	3p22.2	<i>MLH1</i>	O	O
HGNC:7217	MPL proto-oncogene, thrombopoietin receptor	1p34.2	<i>MPL</i>	O	O
HGNC:7325	mutS homolog 2	2p21-p16.3	<i>MSH2</i>	O	O
HGNC:7329	mutS homolog 6	2p16.3	<i>MSH6</i>	O	O
HGNC:3942	Mechanistic target of rapamycin kinase	1p36.22	<i>MTOR</i>	O	O
HGNC:7553	MYC proto-oncogene, bHLH transcription factor	8q24.21	<i>MYC</i>	O	O
HGNC:7559	MYCN proto-oncogene, bHLH transcription factor	2p24.3	<i>MYCN</i>	O	O
HGNC:7765	Neurofibromin 1	17q11.2	<i>NF1</i>	O	O
HGNC:7773	Neurofibromin 2	22q12.2	<i>NF2</i>	O	O
HGNC:7782	Nuclear factor, erythroid 2 like 2	2q31.2	<i>NFE2L2</i>	O	O
HGNC:7881	Notch receptor 1	9q34.3	<i>NOTCH1</i>	O	O
HGNC:7910	Nucleophosmin 1	5q35.1	<i>NPM1</i>	O	O

HGNC:7989	NRAS proto-oncogene, GTPase	1p13.2	<i>NRAS</i>	O		O
HGNC:8031	Neurotrophic receptor tyrosine kinase 1	1q23.1	<i>NTRK1</i>	O	O	O
HGNC:8032	Neurotrophic receptor tyrosine kinase 2	9q21.33	<i>NTRK2</i>	O	O	O
HGNC:8033	Neurotrophic receptor tyrosine kinase 3	15q25.3	<i>NTRK3</i>	O		O
HGNC:18731	Programmed cell death 1 ligand 2	9p24.1	<i>PDCD1LG2</i>	O		O
HGNC:8803	Platelet derived growth factor receptor alpha	4q12	<i>PDGFRA</i>	O		O
HGNC:8804	Platelet derived growth factor receptor beta	5q32	<i>PDGFRB</i>	O		O
HGNC:8975	Phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha	3q26.32	<i>PIK3CA</i>	O		O
HGNC:8979	Phosphoinositide-3-kinase regulatory subunit 1	5q13.1	<i>PIK3R1</i>	O		O
HGNC:9122	PMS1 homolog 2, mismatch repair system component	7p22.1	<i>PMS2</i>	O		O
HGNC:9302	Protein phosphatase 2 scaffold subunit Aalpha	19q13.41	<i>PPP2RIA</i>	O		O
HGNC:9588	Phosphatase and tensin homolog	10q23.31	<i>PTEN</i>	O		O
HGNC:9644	protein tyrosine phosphatase non-receptor type 11	12q24.13	<i>PTPN11</i>	O		O
HGNC:9829	Raf-1 proto-oncogene, serine/threonine kinase	3p25.2	<i>RAF1</i>	O		O
HGNC:9884	RB transcriptional corepressor 1	13q14.2	<i>RBI</i>	O		O
HGNC:9967	Ret proto-oncogene	10q11.21	<i>RET</i>	O	O	O
HGNC:10011	Ras homolog, mTORC1 binding	7q36.1	<i>RHEB</i>	O		O
HGNC:667	Ras homolog family member A	3p21.31	<i>RHOA</i>	O		O
HGNC:10023	Ras like without CAAX 1	1q22	<i>RITI</i>	O		O
HGNC:18505	Ring finger protein 43	17q22	<i>RNF43</i>	O		O
HGNC:10261	ROS proto-oncogene 1, receptor tyrosine kinase	6q22.1	<i>ROS1</i>	O	O	O
HGNC:10471	RUNX family transcription factor 1	21q22.12	<i>RUNX1</i>	O		O

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HGNC:18420	SET domain containing 2, histone lysine methyltransferase	3p21.31	<i>SETD2</i>	O	O
HGNC:6770	SMAD family member 4	18q21.2	<i>SMAD4</i>	O	O
HGNC:11119	Smoothed, frizzled class receptor	7q32.1	<i>SMO</i>	O	O
HGNC:11355	Stromal antigen 2	Xq25	<i>STAG2</i>	O	O
HGNC:11389	Serine/threonine kinase 11	19p13.3	<i>STK11</i>	O	O
HGNC:11641	Transcription factor 7 like 2	10q25.2-q25.3	<i>TCF7L2</i>	O	O
HGNC:11730	Telomerase reverse transcriptase	5p15.33	<i>TERT</i>	O	O
HGNC:11989	DNA topoisomerase II alpha	17q21.2	<i>TOP2A</i>	O	O
HGNC:11998	Tumor protein p53	17p13.1	<i>TP53</i>	O	O
HGNC:12362	TSC complex subunit 1	9q34	<i>TSC1</i>	O	O
HGNC:12363	TSC complex subunit 2	16p13.3	<i>TSC2</i>	O	O
HGNC:12453	U2 small nuclear RNA auxiliary factor 1	21q22.3	<i>U2AF1</i>	O	O
HGNC:12687	von Hippel-Lindau tumor suppressor	3p25.3	<i>VHL</i>	O	O
HGNC:12530	UDP glucuronosyltransferase family 1 member A1	2q37.1	<i>UGT1A1</i>	O	O

CNV, copy-number variation; INDEL, insertions/deletion; SNV, single nucleotide variant.