Cancer Gene List – I (a-b)

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Abstract: There are thousands of genes that are related to the cancer development. This article gives the genes that are supposed as cancer genes. This is cancer gene list part 1 (a-b).
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Cell proliferation is regulated during the body growth and the cancer could happen if the regulation is out of control. Viruses can be used to introduce the reprogramming factors into adult cells, However, there is a risk that the virus used to introduce the stem cell factors sometimes possibly causes cancers. Controlling genes on and off is central to the biological process. The most serious medical conditions, such as cancer and birth defects, are due to abnormal cell division and differentiation. Cancer cell lines can be used to find potential anti-tumor drugs. To control the differentiation of stem cell precisely is important in the drug development (Ma, et al, 2014).

There are thousands of genes that are related to the cancer development. Here it gives 1400 genes that are supposed as cancer genes (Table 1) (Atlas of Genetics and Cytogenetics in Oncology and Haematology., 2015). HGNC is responsible for approving unique symbols and names for human loci, including protein coding genes, ncRNA genes and pseudogenes, to allow unambiguous scientific communication. The HUGO Gene Nomenclature Committee is the only worldwide authority that assigns standardised nomenclature to human genes. The HGNC approves both a short-form abbreviation known as a gene symbol, and also a longer and more descriptive name. Each symbol is unique and the committee ensures that each gene is only given one approved gene symbol. This allows for clear and unambiguous reference to genes in scientific communications, and facilitates electronic data retrieval from databases and publications. In preference, symbols also maintain parallel construction for different members of a gene family and can also be used for orthologous genes in other vertebrate species (HGNC, 2015).

Table 1. Cancer gene list 1

Gene	Location	HGNC (Hugo) Name
1110035O14Rik (Alias)	7q22.3	NAMPT
123F2 (Alias)	3p21.31	RASSF1
12CC4 (Alias)	3p13	FOXP1
12-LOX (Alias)	17p13.1	ALOX12
12(S)-lipoxygenase (Alias)	17p13.1	ALOX12
12S-type (Alias)	17p13.1	ALOX12
13009 (Alias)	20q13.2	ZNF217
130 kDa retinoblastoma-associated protein (Alias)	16q12.2	RBL2
1500003D12Rik (Alias)	4p15.32	MED28
15-LOX (Alias)	17p13.2	ALOX15
16.3A5 (Alias)	11p13	CD59
1810061I13Rik (Alias)	12p13.2	CLEC1B
18A2 (Alias)	1q21.3	S100A4

1F5 (Alias)	11p13	CD59
22822	12q21.2	PHLDA1 (pleckstrin homology-like domain, family A, member 1)
2610111G01Rik (Alias)	11q13.2	CD248
2PP2A (Alias)	9q34.11	SET
3_123833568 (Alias)	3q21.1	HSPBAP1
4.1B (Alias)	18p11.31	EPB41L3
42A (Alias)	1q21.3	S100A4
42C (Alias)	1q21.3	S100A10
447AA (Alias)	1p35.2	COL16A1
4E-BP1 (Alias)	8p11.23	EIF4EBP1
4EBP1 (Alias)	8p11.23	EIF4EBP1
4F9 (Alias)	11p11.2	CD82
51C (Alias)	11q13.4	INPPL1
53BP2 (Alias)	1q41	TP53BP2
5DII (Alias)	14q31.1	DIO2
5H9 (Alias)	12p13.31	CD9
5-LO (Alias)	10q11.21	ALOX5
5LPG (Alias)	10q11.21	ALOX5
5T4AG (Alias)	6q14.1	TPBG
5T4 (Alias)	6q14.1	TPBG
60B8AG (Alias)	1q21.3	S100A8
60B8AG (Alias)	1q21.3	S100A9
60kDa Tat interacting protein (Alias)	11q13.1	KAT5
80K-L (Alias)	6q21	MARCKS
8_125443572 (Alias)	8q24.13	RNF139
9030418M05Rik (Alias)	1p34.1	TSPAN1
A20 (Alias)	6q23.3	TNFAIP3
A33 (Alias)	1q24.1	GPA33
A8 (Alias)	9q22.2	SEMA4D
AAAT (Alias)	19q13.32	SLC1A5
AAC1 (Alias)	8p22	NAT1
AAC2 (Alias)	8p22	NAT2
AADC (Alias)	7p12.1	DDC
AAG11 (Alias)	2q12.1	FHL2
AAG4 (Alias)	8p21.1	CLU
AAMP	2q35	AAMP (angio-associated, migratory cell protein)
AAT3 (Alias)	3p24.1	TGFBR2
AAT7 (Alias)	3q21.1	MYLK
AATF	17q12	AATF (Apoptosis Antagonizing Transcription Factor)

ABCB1	7q21.12	ABCB1 ATP-binding cassette, sub-family B (MDR/TAP), member 1
ABCB5alpha (Alias)	7p21.1	ABCB5
ABCB5	7p21.1	ABCB5 (ATP-binding cassette, sub-family B (MDR/TAP), member 5)
ABCB5beta (Alias)	7p21.1	ABCB5
ABCC10	6p21.1	ABCC10 (ATP-binding cassette, sub-family C (CFTR/MRP), member 10)
ABCC11	16q12.1	ABCC11 (ATP-binding cassette, sub-family C (CFTR/MRP), member 11)
ABCC1	16p13.11	ABCC1 (ATP-binding cassette, sub-family C (CFTR/MRP), member 1)
ABCD-3 (Alias)	16q21	CX3CL1
ABI1	10p12.1	ABI1 (Abl-Interactor 1)
ABL1	9q34.12	ABL1 (v-abl Abelson murine leukemia viral oncogene homolog 1)
ABL2	1q25.2	ABL2 (Abelson homolog 2)
ABL (Alias)	9q34.12	ABL1
ABLL (Alias)	1q25.2	ABL2
ABP (Alias)	17p13.1	SHBG
ABP/ZF (Alias)	7q34	TRPV6
ACC-4 (Alias)	15q25.1	CTSH
ACC-5 (Alias)	15q25.1	CTSH
ACDCR1 (Alias)	1q32.1	ADIPOR1
ACDMPV (Alias)	16q24.1	FOXF1
ACEE (Alias)	7q22.1	ACHE
ACHE	7q22.1	ACHE (acetylcholinesterase)
ACKR3	2q37.3	ACKR3 (atypical chemokine receptor 3)
ACL (Alias)	17q21.2	ACLY
ACLY	17q21.2	ACLY (ATP citrate lyase)
ACS3 (Alias)	7p21.1	TWIST1
ACTB	7p22.1	ACTB (Actin, beta)

ACTININ-4 (Alias)	19q13.2	ACTN4
Activator Protein-1 (Alias)	1p32.1	JUN
ACTN4	19q13.2	ACTN4 (actinin, alpha 4)
ACTR (Alias)	20q13.12	NCOA3
ACTRI (Alias)	2q24.1	ACVR1
ACTR-IIA (Alias)	2q22.3	ACVR2A
ACTRIIA (Alias)	2q22.3	ACVR2A
ACTRII (Alias)	2q22.3	ACVR2A
Acute Phase Response Factor, APRF (Alias)	17q21.2	STAT3
ACVR1A (Alias)	2q24.1	ACVR1
ACVR1	2q24.1	ACVR1 (activin A receptor, type I)
ACVR2A	2q22.3	ACVR2A (Activin Receptor Type 2)
ACVR2 (Alias)	2q22.3	ACVR2A
ACVRL1	12q13.13	ACVRL1 (activin A receptor type II-like 1)
ACVRLK1 (Alias)	12q13.13	ACVRL1
ACVRLK2 (Alias)	2q24.1	ACVR1
AD10 (Alias)	15q21.3	ADAM10
AD3L (Alias)	1q42.13	PSEN2
AD4 (Alias)	1q42.13	PSEN2
AD4BP (Alias)	9q33.3	NR5A1
ADABP (Alias)	2q24.2	DPP4
ADAM10	15q21.3	ADAM10 (ADAM metallopeptidase domain 10)
ADAM12	10q26.2	ADAM12 (ADAM metallopeptidase domain 12 (meltrin alpha))
ADAM-12 (Alias)	10q26.2	ADAM12
ADAM17	2p25.1	ADAM17 (ADAM metallopeptidase domain 17)
ADAM18 (Alias)	2p25.1	ADAM17
ADAM23	2q33.3	ADAM23 (ADAM metallopeptidase domain 23)
ADAM9	8p11.22	ADAM9 (ADAM metallopeptidase domain 9 (meltrin gamma))
ADAMTS12	5p13.3	ADAMTS12 (ADAM Metallopeptidase With Thrombospondin Type 1 Motif, 12)

ADAMTS15	11q24.3	ADAMTS15 (ADAM Metallopeptidase With Thrombospondin Type 1 Motif, 15)
ADAMTS1	21q21.3	ADAMTS1 (ADAM metallopeptidase with thrombospondin type 1 motif, 1)
ADAM-TS1 (Alias)	21q21.3	ADAMTS1
ADAMTS9	3p14.1	ADAMTS9 (ADAM metallopeptidase with thrombospondin type 1 motif, 9)
ADANE (Alias)	2q12.3	RANBP2
ADCL2 (Alias)	14q32.12	FBLN5
ADCP2 (Alias)	2q24.2	DPP4
ADCYAP1	18p11.32	ADCYAP1 (adenylate cyclase activating polypeptide 1 (pituitary))
ADD3	10q25.1	ADD3 (adducin 3)
ADDL (Alias)	10q25.1	ADD3
Adducin-like (Alias)	10q25.1	ADD3
ADF (Alias)	9q31.3	TXN
ADIP (Alias)	1p22.3	SSX2IP
ADIPOR1	1q32.1	ADIPOR1 (adiponectin receptor 1)
ADPEAF (Alias)	10q23.33	LGI1
ADRB2	5q32	ADRB2 (adrenoceptor beta 2, surface)
ADRB2R (Alias)	5q32	ADRB2
ADRBR (Alias)	5q32	ADRB2
AE1 (Alias)	17q21.31	SLC4A1
AF10 (ALL1 fused gene from chromosome 10) (Alias)	10p12.31	MLLT10
AF15q14 (Alias)	15q15.1	CASC5
AF15Q14 (Alias)	15q15.1	CASC5
AF17 (ALL1 fused gene from chromosome 17) (Alias)	17q12	MLLT6
AF17q25 (ALL1 fused gene from chromosome 17q25) (Alias)	17q25.2	SEPT9
AF1p (ALL1 fused gene from chromosome 1p) (Alias)	1p32.3	EPS15
AF1q (ALL1 fused gene from chromosome 1q) (Alias)	1q21.3	MLLT11

AF22 (ALL1 fused gene from chromosome 22) (Alias)	22q11.21	SEPT5
AF4 (Alias)	4q21.3	AFF1
AF4p12 (Alias)	4p11	FRYL
AF5q31 (ALL1 fused gene from chromosome 5q31) (Alias)	5q31.1	AFF4
AF6 (ALL1 fused gene from chromosome 6) (Alias)	6q27	MLLT4
AF6q21 (ALL1 fused gene from chromosome 6q21) (Alias)	6q21	FOXO3
AF9 (ALL1 fused gene from chromosome 9) (Alias)	9p21.3	MLLT3
AF9q34 (Alias)	9q33.2	DAB2IP
AFAP1L2	10q25.3	AFAP1L2 (actin filament associated protein 1-like 2)
AFCP (Alias)	2p11.2	CAPG
AFF1	4q21.3	AFF1 (AF4/FMR2 family, member 1)
AFF3	2q11.2	AFF3 (lymphoid nuclear protein related to AF4)
AFF4	5q31.1	AFF4 (ALL1 fused gene from chromosome 5q31)
AFGF (Alias)	5q31.3	FGF1
AFP	4q13.3	AFP (alpha-fetoprotein)
AFX1 (ALL1 fused gene from chromosome X, 1) (Alias)	Xq13.1	FOXO4
AFX (Alias)	Xq13.1	FOXO4
AGAP-2 (Alias)	12q14.1	AGAP2
AGAP2	12q14.1	AGAP2 (Centaurin , gamma1)
AGER	6p21.32	AGER (advanced glycosylation end product-specific receptor)
AGM4 (Alias)	10q24.1	BLNK
AGMX1 (Alias)	Xq22.1	BTK
AGS2 (Alias)	1p12	NOTCH2
AGTR2-interacting protein (Alias)	8p22	MTUS1
AGTRL1 (Alias)	11q12.1	APLNR
AH antigen (Alias)	1q41	CENPF
AHC (Alias)	Xp21.2	NR0B1
AHCH (Alias)	Xp21.2	NR0B1
AHO (Alias)	20q13.32	GNAS

AHX (Alias)	Xp21.2	NR0B1
AI385711 (Alias)	3p21.1	PRKCD
AIB1 (amplified in breast cancer-1) (Alias)	20q13.12	NCOA3
AICARFT (Alias)	2q35	ATIC
AICARFT/IMPCHASE (5-aminoimidazole-4-carboxamide ribonucleotide formyltransferase/IMP cyclohydrolase) (Alias)	2q35	ATIC
AIF (Alias)	Xq26.1	AIFM1
AIFM1	Xq26.1	AIFM1 (apoptosis-inducing factor, mitochondrion-associated, 1)
AIFM2	10q22.1	AIFM2 (apoptosis-inducing factor, mitochondrion-associated, 2)
AIG6 (Alias)	6p21.31	FKBP5
AIGF (Alias)	10q24.32	FGF8
AIID (Alias)	Xp11.23	FOXP3
AIK2 (Alias)	17p13.1	AURKB
AIM-1 (Alias)	17p13.1	AURKB
AIM1 (Alias)	17p13.1	AURKB
AIM (Alias)	19p13.2	DNMT1
AIP1 (Alias)	9q33.2	DAB2IP
AIP5 (Atropin-1-interacting protein 5) (Alias)	8q21.3	WWP1
AIP	11q13.2	AIP (aryl hydrocarbon receptor interacting protein)
AIS (Alias)	Xq12	AR
AIS (Alias)	3q28	TP63
AIT (Alias)	12q23.1	SLC5A8
AITRL (Alias)	1q25.1	TNFSF18
AKAP12	6q25.1	AKAP12 A kinase (PRKA) anchor protein 12
AKAP250 (Alias)	6q25.1	AKAP12
AKAP350 (Alias)	7q21.2	AKAP9
AKAP450 (Alias)	7q21.2	AKAP9
AKAP9	7q21.2	AKAP9 (A kinase (PRKA) anchor protein (yotiao) 9)
AKR1C3	10p15.1	AKR1C3 (aldo-keto reductase family 1, member C3 (3-alpha hydroxysteroid dehydrogenase, type II))
AKT1	14q32.33	AKT1 (v-akt murine thymoma viral oncogene homolog 1)

AKT2	19q13.2	AKT2 (v-akt murine thymoma viral oncogene homolog 2)
AKT3	1q43	AKT3 (v-akt murine thymoma viral oncogene homolog 3, Protein Kinase B gamma)
AKT (Alias)	14q32.33	AKT1
ALDB (Alias)	9q31.1	ALDOB
ALDH2	12q24.12	ALDH2 (aldehyde dehydrogenase 2 family (mitochondrial))
ALDOB	9q31.1	ALDOB (aldolase B, fructose-bisphosphate)
ALEX1 (arm protein lost in epithelial cancers, X chromosome, 1) (Alias)	Xq22.1	ARMCX1
ALEX2 (arm protein lost in epithelial cancers, X chromosome, 2) (Alias)	Xq22.1	ARMCX2
ALEX3 (arm protein lost in epithelial cancers, X chromosome, 3) (Alias)	Xq22.1	ARMCX3
ALG-2 (Alias)	5p15.33	PDCD6
ALIEN (Alias)	15q21.1	COPS2
ALK-1 (Alias)	12q13.13	ACVRL1
ALK1 (Alias)	12q13.13	ACVRL1
ALK2 (Alias)	2q24.1	ACVR1
ALK	2p23.2	ALK (anaplastic lymphoma receptor tyrosine kinase)
ALK-SMase (Alkaline sphingomyelinase) (Alias)	17q25.3	ENPP7
ALL1 (Alias)	4q21.3	AFF1
ALL1, HRX, Htrx (human trithorax), TRX1 (Alias)	11q23.3	KMT2A
ALO17 (ALK lymphoma oligomerization partner on chromosome 17) (Alias)	17q25.3	RNF213
ALOX12	17p13.1	ALOX12 (Arachidonate 12-Lipoxygenase) Homo sapiens
ALOX15	17p13.2	ALOX15 (Arachidonate 15-Lipoxygenase)
ALOX5	10q11.21	ALOX5 (Arachidonate 5-Lipoxygenase).
ALP (Alias)	2q14.3	BIN1
Alpha(B)-crystallin (Alias)	11q23.1	CRYAB
Alpha-fetoprotein enhancer binding protein (Alias)	16q22.2	ZFHX3
Alpha-PAK (Alias)	11q13.5	PAK1

ALPHA-PAL (Alpha palindromic-binding protein) (Alias)	7q32.2	NRF1
ALPHA-RLC (Alias)	3p22.2	ITGA9
ALPS2B (Alias)	2q33.1	CASP8
ALS14 (Alias)	9p13.3	VCP
ALS9 (Alias)	14q11.2	ANG
AMAP1 (Alias)	8q24.21	ASAP1
AMBN	4q13.3	AMBN (ameloblastin (enamel matrix protein))
AMER1 (APC MEmbrane Recruitment 1) (Alias)	Xq11.2	AMER1
AMER1	Xq11.2	AMER1 (APC membrane recruitment protein 1)
AMFR	16q12.2	AMFR (autocrine motility factor receptor)
AMID (Alias)	10q22.1	AIFM2
AML1 (acute myeloid leukemia 1) (Alias)	21q22.12	RUNX1
AML1T1 (AML1 translocated to, 1), (Alias)	8q21.3	RUNX1T1
AML3 (Alias)	6p21.1	RUNX2
AMOT	Xq23	AMOT (angiomotin)
AMP-19	19q13.4	AMP-19 (AML1 partner from chromosome 19)
AMPH2 (Alias)	2q14.3	BIN1
AMPH-II (Alias)	2q14.3	BIN1
AMPHL (Alias)	2q14.3	BIN1
AMPK (Alias)	12q24.23	PRKAB1
AMPKb (Alias)	12q24.23	PRKAB1
AMPKbeta1 (Alias)	12q24.23	PRKAB1
AMPK beta (Alias)	12q24.23	PRKAB1
A-myb (Alias)	8q13.1	MYBL1
A-Myb (Alias)	8q13.1	MYBL1
A-MYB (Alias)	8q13.1	MYBL1
AMYB (Alias)	8q13.1	MYBL1
AN2 (Alias)	11p13	PAX6
AN (Alias)	11p13	PAX6
ANCR (Alias)	15q11.2	UBE3A
ANE1 (Alias)	2q12.3	RANBP2
ANG	14q11.2	ANG (angiogenin, ribonuclease, RNase A family, 5)
ANILLIN (Alias)	7p14.2	ANLN
ANLN	7p14.2	ANLN (anillin, actin binding protein)
Annexin II ligand (Alias)	1q21.3	S100A10

ANOP3 (Alias)	3q26.33	SOX2
ANP32A	15q23	ANP32A (acidic (leucine-rich) nuclear phosphoprotein 32 family, member A)
ANX1 (Alias)	9q21.13	ANXA1
ANX2L (Alias)	1q21.3	S100A10
ANX2LG (Alias)	1q21.3	S100A10
ANXA1	9q21.13	ANXA1 (annexin A1)
AOE37-2 (Alias)	Xp22.11	PRDX4
AP-2 (Alias)	6p24.3	TFAP2A
AP-2alpha (Alias)	6p24.3	TFAP2A
AP2-alpha (Alias)	6p24.3	TFAP2A
AP2-GAMMA (Alias)	20q13.31	TFAP2C
AP2TF (Alias)	6p24.3	TFAP2A
Apaf-1 (Alias)	12q23.1	APAF1
APAF1	12q23.1	APAF1 (Apoptotic protease activating factor 1)
APAF-3 (Alias)	1p36.21	CASP9
APC	5q22.2	APC (adenomatous polyposis coli)
API1 (Alias)	11q22.2	BIRC2
API2 (Alias)	11q22.2	BIRC3
APJ (Alias)	11q12.1	APLNR
APJR (Alias)	11q12.1	APLNR
APK1 (Alias)	Xq26.1	ENOX2
APLNR	11q12.1	APLNR (apelin receptor)
Apo-2L (Alias)	3q26.31	TNFSF10
APO2L (Alias)	3q26.31	TNFSF10
Apo-J (Alias)	8p21.1	CLU
APOJ (Alias)	8p21.1	CLU
APOLLON (Alias)	2p22.3	BIRC6
APPS (Alias)	8p23.1	CTSB
AQP4	18q11.2	AQP4 (aquaporin 4)
ARA24 (Alias)	12q24.33	RAN
ARA70 (Alias)	10q11.23	NCOA4
ARA9 (Alias)	11q13.2	AIP
ARA (Alias)	6p25.3	FOXC1
ARACHE (Alias)	7q22.1	ACHE
AR (Alias)	4q13.3	AREG

AR	Xq12	AR (Androgen Receptor (dihydrotestosterone receptor; testicular feminization; spinal and bulbar muscular atrophy; Kennedy disease))
Arc-1 (Alias)	16q22.1	CDH1
ARC (Apoptosis Repressor with CARD) (Alias)	16q22.1	NOL3
ARCC2 (Alias)	1p36.13	EPHA2
ARCL1A (Alias)	14q32.12	FBLN5
ARD-1 (Alias)	1p35.3	PPP1R8
ARD1 (Alias)	1p35.3	PPP1R8
AREG	4q13.3	AREG (amphiregulin (schwannoma-derived growth factor))
ARG (Abelson related gene) (Alias)	1q25.2	ABL2
ARGBP2 (Arg/Abl-interacting protein 2) (Alias)	4q35.1	SORBS2
ARH12 (Alias)	3p21.31	RHOA
ARH6 (Alias)	2p24.1	RHOB
ARH9 (Alias)	1p13.2	RHOC
ARHA (Alias)	3p21.31	RHOA
ARHB (Alias)	2p24.1	RHOB
ARHC (Alias)	1p13.2	RHOC
ARHE (Alias)	2q23.3	RND3
ARHGAP20	11q23.1	ARHGAP20 (Rho GTPase activating protein 20)
ARHGAP26	5q31.3	ARHGAP26 (GTPase activating protein for Rho associated with FAK)
ARHGAP7 (Alias)	8p22	DLC1
ARHGEF12	11q23.3	ARHGEF12 (Rho guanine nucleotide exchange factor (GEF) 12)
ARHGEF23 (Alias)	5p15.2	TRIO
ARHGEF2	1q22	ARHGEF2 (rho/rac guanine nucleotide exchange factor (GEF) 2)
ARHGEF31 (Alias)	3q26.31	ECT2
ARHGEF8 (Alias)	10p15.1	NET1
ARHH (Alias)	4p14	RHOH
ARHI (Alias)	1p31.3	DIRAS3
AR	Xq12	AR (Androgen Receptor (dihydrotestosterone receptor; testicular feminization; spinal and bulbar muscular atrophy; Kennedy disease))
ARID1A	1p36.11	ARID1A (AT rich interactive domain 1A (SWI-like))

ARID5B	10q21.2	ARID5B (AT rich interactive domain 5B (MRF1-like))
ARK1 (Alias)	20q13.2	AURKA
ARK2 (Alias)	17p13.1	AURKB
ARK5 (Alias)	12q23.3	NUAK1
ARM1 (Alias)	19q13.41	KLK4
ARMCX1	Xq22.1	ARMCX1 (arm protein lost in epithelial cancers, X chromosome, 1)
ARMCX2	Xq22.1	ARMCX2 (arm protein lost in epithelial cancers, X chromosome, 2)
ARMCX3	Xq22.1	ARMCX3 (arm protein lost in epithelial cancers, X chromosome, 3)
ARMD3 (Alias)	14q32.12	FBLN5
ARMD7 (Alias)	10q26.13	HTRA1
ARNIP (Alias)	4q21.1	RCHY1
ARNT	1q21.3	ARNT (aryl hydrocarbon receptor nuclear translocator)
ARVC10 (Alias)	18q12.1	DSG2
ARVD10 (Alias)	18q12.1	DSG2
AS (Alias)	15q11.2	UBE3A
ASAP1	8q24.21	ASAP1 (ArfGAP with SH3 domain, ankyrin repeat and PH domain 1)
ASC (Alias)	16p11.2	PYCARD
ASCIZ (Alias)	16q23.2	ATMIN
ASCL1	12q23.2	ASCL1 (Achaete-scute homolog 1 or achaete-scute complex homolog 1)
ASCT2 (Alias)	19q13.32	SLC1A5
ASF (Alias)	17q22	SRSF1
ASFGF2 (Alias)	4q28.1	NUDT6
ASH1 (Alias)	12q23.2	ASCL1
ASH2 (Alias)	8p11.23	ASH2L
ASH2L1 (Alias)	8p11.23	ASH2L
ASH2L2 (Alias)	8p11.23	ASH2L
ASH2L	8p11.23	ASH2L (ash2 (absent, small, or homeotic)-like (Drosophila))

ASH (Abundant Src Homology) (Alias)	17q25.1	GRB2
ASNS	7q21.3	ASNS (asparagine synthetase)
ASP (Alias)	1q31.3	ASPM
ASPL (Alveolar soft part sarcoma locus) (Alias)	17q25.3	ASPSCR1
ASPM	1q31.3	ASPM (asp (abnormal spindle) homolog, microcephaly associated (Drosophila))
ASPP2 (Alias)	1q41	TP53BP2
ASPSCR1	17q25.3	ASPSCR1 (Alveolar soft part sarcoma critical region 1)
ASV (Avian Sarcoma Virus) (Alias)	20q11.23	SRC
ASXL1	20q11.21	ASXL1 (additional sex combs like 1 (Drosophila))
ASY (Alias)	2p16.1	RTN4
AT225 (Alias)	5q31.2	EGR1
AT (Alias)	Xq22.1	BTK
ATBO (Alias)	19q13.32	SLC1A5
ATF1	12q13.12	ATF1 (activating transcription factor 1)
ATF2	2q31.1	ATF2 (activating transcription factor 2)
ATF3	1q32.3	ATF3 (activating transcription factor 3)
ATF3deltaZip2 (Alias)	1q32.3	ATF3
ATF3deltaZip2c (Alias)	1q32.3	ATF3
ATF3deltaZip3 (Alias)	1q32.3	ATF3
ATF4	22q13.1	ATF4 (activating transcription factor 4 (tax-responsive enhancer element B67))
ATF5	19q13.33	ATF5 (activating transcription factor 5)
ATFX (Alias)	19q13.33	ATF5
ATIC	2q35	ATIC (5-aminoimidazole-4-carboxamide ribonucleotide formyltransferase/IMP cyclohydrolase)
ATIP (angiotensin II receptor 2- interacting protein) (Alias)	8p22	MTUS1
ATK (Alias)	Xq22.1	BTK
ATLD (Alias)	11q21	MRE11A
ATM	11q22.3	ATM (ataxia telangiectasia mutated)

ATMIN	16q23.2	ATMIN (ATM Interactor)
AT motif-binding factor 1 (Alias)	16q22.2	ZFHX3
ATOD4 (Alias)	17q25.3	SOCS3
ATPCL (Alias)	17q21.2	ACLY
ATP-dependent DNA helicase Q4 (Alias)	8q24.3	RECQL4
ATR	3q23	ATR (ataxia telangiectasia and Rad3 related)
Atriopeptidase (Alias)	3q25.2	MME
ATX (Alias)	8q24.12	ENPP2
AUF1A (Alias)	4q21.22	HNRNPD
AUF1 (Alias)	4q21.22	HNRNPD
AURA (Alias)	20q13.2	AURKA
AurB (Alias)	17p13.1	AURKB
AURKA	20q13.2	AURKA (aurora kinase A)
AURKB	17p13.1	AURKB (aurora kinase B)
Aurora2 (Alias)	20q13.2	AURKA
Aurora A (Alias)	20q13.2	AURKA
Autotaxin (Alias)	8q24.12	ENPP2
AUTS2	7q11.22	AUTS2 (autism susceptibility candidate 2)
AVEN	15q14	AVEN (apoptosis, caspase activation inhibitor)
AWD (Alias)	17q21.33	NME1
AXIN1	16p13.3	AXIN1 (axin 1)
AXIN2	17q24.1	AXIN2 (axin 2)
AXIN (Alias)	16p13.3	AXIN1
AXL	19q13.2	AXL (AXL receptor tyrosine kinase)
AZU-1 (Alias)	10q26.13	TACC2

B120 (Alias)	1p36.11	ARID1A
B23 (Alias)	5q35.1	NPM1
B2AR (Alias)	5q32	ADRB2
B3Gn-T6 (Alias)	11q13.5	B3GNT6
B3GNT6	11q13.5	B3GNT6 (UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 6 (core 3

		synthase))
B7-H4 (Alias)	1p13.1	VTCN1
B7H4 (Alias)	1p13.1	VTCN1
B7h.5 (Alias)	1p13.1	VTCN1
B7S1 (Alias)	1p13.1	VTCN1
B7X (Alias)	1p13.1	VTCN1
BA2 (Alias)	12p13.31	CD9
BA554C12.1 (Alias)	22q13.2	RBX1
BAALC	8q22.3	BAALC (brain and acute leukemia, cytoplasmic)
BACH2	6q15	BACH2 (BTB and CNC homology 1, basic leucine zipper transcription factor 2)
BAD	11q13.1	BAD (BCL2-antagonist of cell death)
BAD (BCLXL/BCL2 associated death promoter homolog (Alias)	11q13.1	BAD
BAF180 (Alias)	3p21.1	PBRM1
BAF190 (Alias)	19p13.2	SMARCA4
BAF250a (Alias)	1p36.11	ARID1A
BAF250 (Alias)	1p36.11	ARID1A
BAF47 (BRG1-associated factor) (Alias)	22q11.23	SMARCB1
BAG-1 (Alias)	9p13.3	BAG1
BAG1	9p13.3	BAG1 (BCL2-associated athanogene)
BAG-3 (Alias)	10q26.11	BAG3
BAG3	10q26.11	BAG3 (Bcl-2 associated athanogene 3)
BAK1	6p21.31	BAK1 (BCL2-antagonist/killer 1)
BAK (Alias)	6p21.31	BAK1
BAK-LIKE (Alias)	6p21.31	BAK1
BAM (Alias)	2q13	BCL2L11
BAP1	3p21.1	BAP1 (BRCA1 associated protein-1 (ubiquitin carboxy-terminal hydrolase))
BAPX2 (Alias)	8p21.2	NKX3-1
BAR (Alias)	5q32	ADRB2
BAR (Alias)	12q23.1	NR1H4
BARD1	2q35	BARD1 (BRCA1 associated RING domain 1)

BASH (Alias)	10q24.1	BLNK
BAT8 (Alias)	6p21.33	EHMT2
BAX	19q13.33	BAX (BCL2-associated X protein)
BB18 (Alias)	9q22.2	SEMA4D
BB2 (Alias)	19p13.2	ICAM1
BBC2 (Alias)	11q13.1	BAD
BBC3	19q13.32	BBC3 (BCL2 binding component 3)
BBF2H7 (BBF2 human homolog on chromosome 7) (Alias)	7q33	CREB3L2
BBGD (Alias)	2q36.3	SLC19A3
BBMI (Alias)	12q13.3	MYO1A
BBP (Alias)	1q41	TP53BP2
BC032224 (Alias)	5q32	PDGFRB
BC10 (Alias)	20q11.23	BLCAP
BCAR1	16q23.1	BCAR1 (breast cancer anti-estrogen resistance 1)
BCAS3	17q23.2	BCAS3 (breast carcinoma amplified sequence 3)
BCAS4	20q13.13	BCAS4 (breast carcinoma amplified sequence 4)
BCD1 (Alias)	10p15.1	KLF6
BCH (Alias)	14q13.3	NKX2-1
Bcl-10 (Alias)	1p22.3	BCL10
BCL10	1p22.3	BCL10 (B-cell CLL/lymphoma 10)
BCL11A	2p16.1	BCL11A (B-cell lymphoma/leukemia 11A)
BCL11B	14q32.2	BCL11B (B-cell lymphoma/leukaemia 11B)
BCL1 (B-cell leukemia/lymphoma 1) (Alias)	11q13.3	CCND1
BCL2	18q21.33	BCL2 (B-cell leukemia/lymphoma 2)
BCL2L11	2q13	BCL2L11 (BCL2-like 11 (apoptosis facilitator))
BCL2L12	19q13.33	BCL2L12 (BCL2-like 12 (proline-rich))
BCL2L14	12p13.2	BCL2L14 (BCL2-like 14 (apoptosis facilitator))
BCL2L15	1p13.2	BCL2L15 (BCL2-like 15)

Bcl2-L-1 (Alias)	20q11.21	BCL2L1
BCL2L1	20q11.21	BCL2L1 (BCL2-like 1)
BCL2L4 (Alias)	19q13.33	BAX
Bcl2-L-7 (Alias)	6p21.31	BAK1
BCL2L7 (Alias)	6p21.31	BAK1
BCL2L8 (Bcl-2-like 8 protein) (Alias)	11q13.1	BAD
BCL2L9 (Alias)	2q37.3	BOK
BCL2L (Alias)	20q11.21	BCL2L1
BCL2-like 9 (Alias)	2q37.3	BOK
BCL5 (Alias)	3q27.3	BCL6
BCL6A (Alias)	3q27.3	BCL6
BCL6	3q27.3	BCL6 (B-Cell Lymphoma 6)
BCL7B	7q11.23	BCL7B (B-cell CLL/lymphoma 7B)
BCL8A (Alias)	15q11.2	NBEAP1
BCL8 (Alias)	15q11.2	NBEAP1
BCL9	1q21.2	BCL9 (B-cell CLL/lymphoma 9)
BCLAF1	6q23.3	BCLAF1 (BCL2-associated transcription factor 1)
BCLG (Alias)	12p13.2	BCL2L14
Bcl-X (Alias)	20q11.21	BCL2L1
BCLX (Alias)	20q11.21	BCL2L1
BCL-XL/S (Alias)	20q11.21	BCL2L1
BCMA (Alias)	16p13.13	TNFRSF17
BCM (Alias)	16p13.13	TNFRSF17
BCR1 (Alias)	22q11.23	BCR
BCR	22q11.23	BCR (Breakpoint cluster region)
BCSG1 (Alias)	10q23.2	SNCG
BD1 (Alias)	8p23.1	DEFB1
BDB1 (Alias)	9q22.31	ROR2
BDB (Alias)	9q22.31	ROR2
BDGI (Alias)	16q23.3	OSGIN1
BEK (Alias)	10q26.13	FGFR2
BEND8 (Alias)	19p13.2	NACC1
Berg36 (Alias)	14q24.1	ZFP36L1
Beta-1,3-N-acetylglucosaminyltransferase-6 (Alias)	11q13.5	B3GNT6
BETA2AR (Alias)	5q32	ADRB2

Beta3Gn-T6 (Alias)	11q13.5	B3GNT6
Beta actin (Alias)	7p22.1	ACTB
Beta cytoskeletal actin (Alias)	7p22.1	ACTB
Betaglycan (Alias)	1p22.1	TGFBR3
BETA-TRCP (Alias)	10q24.32	BTRC
BEX1 (Alias)	Xq22.1	BEX2
BEX1	Xq22.1	BEX1 (brain expressed, X-linked 1)
BEX2 (Alias)	Xq22.1	BEX1
BEX2	Xq22.1	BEX2 (brain expressed X-linked 2)
B-FABP (Alias)	6q22.31	FABP7
BFGF (Alias)	4q27	FGF2
BFGFR (basic fibroblast growth factor receptor) (Alias)	8p11.23	FGFR1
Bfk (Alias)	1p13.2	BCL2L15
BGCAN (Alias)	1p22.1	TGFBR3
BGM (bovine gallbladder mucin, cattle) (Alias)	10q26.13	DMBT1
BGnT-6 (Alias)	11q13.5	B3GNT6
BGP1 (Alias)	19q13.2	CEACAM1
BGP (Alias)	19q13.2	CEACAM1
BGP (Alias)	19q13.2	CEACAM1
BGPI (Alias)	19q13.2	CEACAM1
BHC (Alias)	14q13.3	NKX2-1
BHD (Alias)	17p11.2	FLCN
Bhlhb1 (Alias)	21q22.11	OLIG2
BHLHB1 (Alias)	21q22.11	OLIG2
BHLHB4 (Alias)	20q13.13	BCAS4
BID3 (Alias)	12q24.22	HRK
BIGH3 (Alias)	5q31.1	TGFBI
BIM (Alias)	2q13	BCL2L11
BIM-alpha6 (Alias)	2q13	BCL2L11
BIM-beta6 (Alias)	2q13	BCL2L11
BIM-beta7 (Alias)	2q13	BCL2L11
BimEL (Alias)	2q13	BCL2L11
BimL (Alias)	2q13	BCL2L11
BIMP1 (Alias)	22q13.1	CARD10
BIN1	2q14.3	BIN1 (Bridging Integrator 1)
BING2 (Alias)	6p21.32	DAXX
BiP (Alias)	9q33.3	HSPA5
BIP (Alias)	9q33.3	HSPA5

BIRC2	11q22.2	BIRC2 (baculoviral IAP repeat-containing 2)
BIRC3	11q22.2	BIRC3 (baculoviral IAP repeat-containing 3)
BIRC4BP (Alias)	17p13.1	XAF1
BIRC6	2p22.3	BIRC6 (Baculoviral IAP repeat-containing 6)
BIS (Alias)	10q26.11	BAG3
BLBP (Alias)	6q22.31	FABP7
BLCAP	20q11.23	BLCAP (bladder cancer associated protein)
BLIMP-1 (Alias)	6q21	PRDM1
BLIMP1 (Alias)	6q21	PRDM1
BLM	15q26.1	BLM (Bloom)
BLNK	10q24.1	BLNK (B-cell linker)
BLNK-S (Alias)	10q24.1	BLNK
BLU (Alias)	3p21.31	ZMYND10
BM029 (Alias)	1p36.11	ARID1A
BMI1	10p12.2	BMI1 (BMI1 polycomb ring finger oncogene)
BMK1 (Alias)	17p11.2	MAPK7
BMND16 (Alias)	12q13.12	WNT1
BMND1 (Alias)	11q13.2	LRP5
BMP2B1 (Alias)	14q22.2	BMP4
BMP2B (Alias)	14q22.2	BMP4
BMP4	14q22.2	BMP4 (bone morphogenetic protein 4)
B-Myb (Alias)	20q13.12	MYBL2
B-MYB (Alias)	20q13.12	MYBL2
BMYB (Alias)	20q13.12	MYBL2
BND3 (Alias)	17q21.31	SLC4A1
BNIP3a (Alias)	8p21.2	BNIP3L
BNIP3	10q26.3	BNIP3 (Bcl-2/adenovirus E1B 19kD-interacting protein 3)
BNIP3L	8p21.2	BNIP3L (BCL2/adenovirus E1B 19kDa interacting protein 3-like)
BNSP (Alias)	4q22.1	SPP1
BOB1 (Alias)	11q23.1	POU2AF1

BOD (Alias)	2q13	BCL2L11
BOFS (Alias)	6p24.3	TFAP2A
BOK	2q37.3	BOK (BCL2-related ovarian killer)
BOKL (Alias)	2q37.3	BOK
BOP1	8q24.3	BOP1 (block of proliferation 1)
BP1 (Alias)	17q21.33	DLX4
BP-1 (Alias)	8p11.23	EIF4EBP1
B(p51A) (Alias)	3q28	TP63
B(p51B) (Alias)	3q28	TP63
BP-8 (Alias)	1p34.2	YBX1
BPES2 (Alias)	7p21.1	TWIST1
BPES3 (Alias)	7p21.1	TWIST1
BPK (Alias)	Xq22.1	BTK
BPM90 (Alias)	6p23	RANBP9
BPM-L (Alias)	6p23	RANBP9
BPR (Alias)	19q13.33	BCL2L12
BPTP3 (Alias)	12q24.13	PTPN11
BPTP-4 (Alias)	1q32.1	PTPN7
BRAF1 (Alias)	7q34	BRAF
BRAF	7q34	BRAF (v-raf murine sarcoma viral oncogene homolog B1)
Bravo (Alias)	7q31.1	NRCAM
BRCA1-associated RING domain protein 1 (Alias)	2q35	BARD1
BRCA1	17q21.31	BRCA1 (breast cancer 1, early onset)
BRCA2	13q13.1	BRCA2 (breast cancer 2, early onset)
BRCAI (Alias)	17q21.31	BRCA1
BRCC1 (Alias)	17q21.31	BRCA1
BRCC2 (Alias)	13q13.1	BRCA2
BRCC45 (Alias)	2p23.2	BRE
BRCC4 (Alias)	2p23.2	BRE
BRD4	19p13.12	BRD4 (bromodomain containing 4)
Bre2 (Alias)	8p11.23	ASH2L
BRE	2p23.2	BRE (brain and reproductive organ-expressed (TNFRSF1A modulator))

BRF1 (Alias)	14q24.1	ZFP36L1
BRG-1 (Alias)	19p13.2	SMARCA4
BRG1 (Alias)	19p13.2	SMARCA4
BRIT1 (Alias)	8p23.1	MCPH1
BRK (Alias)	20q13.33	PTK6
BRMS1	11q13.2	BRMS1 (breast cancer metastasis suppressor 1)
BRN2 (Alias)	6q16.1	POU3F2
Brn-3a (Alias)	13q31.1	POU4F1
BRN3A (Alias)	13q31.1	POU4F1
BRODL (Alias)	Xq21.1	BRWD3
BROVCA2 (Alias)	13q13.1	BRCA2
Brt (Alias)	15q15.1	TYRO3
BRUCE (Alias)	2p22.3	BIRC6
BRUNOL3 (Alias)	10p14	CELF2
BRWD3	Xq21.1	BRWD3 (bromodomain and WD repeat domain containing 3)
BSAP (B-cell lineage specific activator protein) (Alias)	9p13.2	PAX5
BSF2 (Alias)	7p15.3	IL6
BSPI (Alias)	4q22.1	SPP1
BTAK (Alias)	20q13.2	AURKA
BTBD14B (Alias)	19p13.2	NACC1
BTCC-1 (Alias)	12p13.31	CD9
BTEB2 (Alias)	13q22.1	KLF5
BTF (Alias)	6q23.3	BCLAF1
BTK	Xq22.1	BTK (Bruton agammaglobulinemia tyrosine kinase)
BTL (Brx-like translocated in leukemia) (Alias)	4q12	CHIC2
BTRC	10q24.32	BTRC (beta-transducin repeat containing)
BTRCP (Alias)	10q24.32	BTRC
Bub1A (Alias)	15q15.1	BUB1B
BUB1A (Alias)	2q13	BUB1
BUB1B	15q15.1	BUB1B (budding uninhibited by benzimidazoles 1 homolog beta (yeast))
BUB1	2q13	BUB1 (budding uninhibited by benzimidazoles 1 homolog (yeast))
BUB1L (Alias)	2q13	BUB1

BUBR1 (Alias)	15q15.1	BUB1B
BYK (Alias)	15q15.1	TYRO3
BYSL	6p21.1	BYSL (Bystin-Like)
BYSTIN (Alias)	6p21.1	BYSL

There are thousands of genes that are related to the cancer development. There are 1400 genes that are supposed as cancer genes (Ma, et al, 2014b).

References

1. Atlas of Genetics and Cytogenetics in Oncology and Haematology. Genes in cancer. http://atlasgeneticsoncology.org/Indexbyalpha/idxa_E.html. 2015.
2. HGNC. HUGO Gene Nomenclature Committee. http://www.genenames.org. 2015.
3. Ma H, Ma M. Stem Cell Introduction. *Stem Cell* 2014;5(2):1-10.
4. Ma H, Ma M, Yang Y. **Cancer Gene List.** Cancer Biology 2014;4(4):66-93]. (ISSN:2150-1041). http://www.cancerbio.net. 10. doi:10.7537/marscbj040414.10. b
5. National Center for Biotechnology Information, U.S. National Library of Medicine**.** http://www.ncbi.nlm.nih.gov/pubmed. 2014.
6. Wikipedia. The free encyclopedia. http://en.wikipedia.org. 2014.

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