

# Mutations in *NOTCH1* and nucleotide excision repair genes are correlated with prognosis of hepatitis B virus-associated hepatocellular carcinoma

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Supplementary Table S1. 409 cancer gene used for deep sequencing

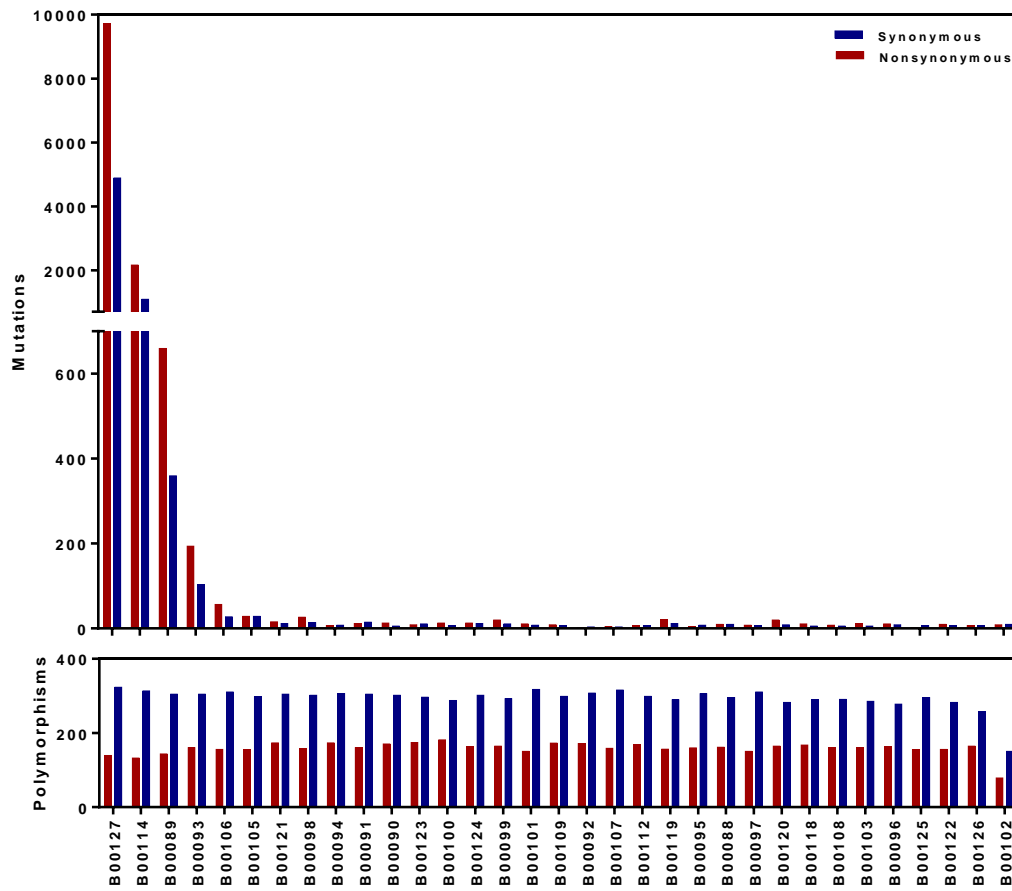
Name	Chr.	Description	Name	Chr.	Description
ABL1	chr9	ABL proto-oncogene 1, non-receptor tyrosine kinase	LCK	chr1	LCK proto-oncogene, Src family tyrosine kinase
ABL2	chr1	ABL proto-oncogene 2, non-receptor tyrosine kinase	LIFR	chr5	leukemia inhibitory factor receptor alpha
ACVR2A	chr2	activin A receptor, type IIA	LPNH3	chr4	latrophilin 3
ADAMTS20	chr12	ADAM metalloproteinase with thrombospondin type 1 motif, 20	LRP3	chr3	LIM domain containing preferred translocation partner in lipoma
AFF1	chr4	AF4/FMR2 family, member 1	LRP1B	chr2	low density lipoprotein receptor-related protein 1B
AFF3	chr2	AF4/FMR2 family, member 3	LTF	chr3	lactotransferrin
AKAP9	chr7	A kinase (PRKA) anchor protein 9	LTK	chr15	leukocyte receptor tyrosine kinase
AKT1	chr14	v-akt murine thymoma viral oncogene homolog 1	MAF	chr16	v-maf avian musculoaponeurotic fibrosarcoma oncogene
AKT2	chr19	v-akt murine thymoma viral oncogene homolog 2	MAFB	chr20	v-maf avian musculoaponeurotic fibrosarcoma oncogene
AKT3	chr1	v-akt murine thymoma viral oncogene homolog 3	MAGEA1	chrX	melanoma antigen family A, 1 (directs expression of antigen membrane associated guanylate kinase, WW and PDZ domain containing 1
ALK	chr2	anaplastic lymphoma receptor tyrosine kinase	MAG1	chr3	mucosa associated lymphoid tissue lymphoma translocation
AMER1	chrX	APC membrane recruitment protein 1	MALT1	chr18	mastermind-like 2 (Drosophila)
APC	chr5	adenomatous polyposis coli	MAML2	chr11	mitogen-activated protein kinase kinase 1
AR	chrX	androgen receptor	MAP2K1	chr15	mitogen-activated protein kinase kinase 2
ARID1A	chr1	AT rich interactive domain 1A (SWI-like)	MAP2K2	chr19	mitogen-activated protein kinase kinase 4
ARID2	chr12	AT rich interactive domain 2 (ARID, RFX-like)	MAP2K4	chr17	mitogen-activated protein kinase kinase 7
ARNT	chr1	aryl hydrocarbon receptor nuclear translocator	MAP3K7	chr6	mitogen-activated protein kinase kinase 8
ASXL1	chr20	additional sex combs like transcriptional regulator 1	MAPK1	chr22	mitogen-activated protein kinase 1
ATF1	chr12	activating transcription factor 1	MAPK8	chr10	mitogen-activated protein kinase 8
ATM	chr11	ATM serine/threonine kinase	MARK1	chr1	MAP/microtubule affinity-regulating kinase 1
ATR	chr3	ATR serine/threonine kinase	MARK4	chr19	MAP/microtubule affinity-regulating kinase 4
ATRX	chrX	alpha thalassemia/mental retardation syndrome X-linked	MBD1	chr18	methyl-CpG binding domain protein 1
AURKA	chr20	aurora kinase A	MCL1	chr1	myeloid cell leukemia 1
AURKB	chr17	aurora kinase B	MDM2	chr12	MDM2 proto-oncogene, E3 ubiquitin protein ligase
AURKC	chr19	aurora kinase C	MDM4	chr1	MDM4, p53 regulator
AXL	chr19	AXL receptor tyrosine kinase	MEN1	chr11	multiple endocrine neoplasia I
BAI3	chr6	brain-specific angiogenesis inhibitor 3	MET	chr7	MET proto-oncogene, receptor tyrosine kinase
BAP1	chr3	BRCA1 associated protein-1 (ubiquitin carboxy-terminal	MITF	chr3	microphthalmia-associated transcription factor
BCL10	chr1	B-cell CLL/lymphoma 10	MLH1	chr3	mutL homolog 1
BCL11A	chr2	B-cell CLL/lymphoma 11A (zinc finger protein)	MLLT10	chr10	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 10 matrix metalloproteinase 2 (gelatinase A, 72kDa gelatinase, 72kDa type IV collagenase)
BCL11B	chr14	B-cell CLL/lymphoma 11B (zinc finger protein)	MMP2	chr16	meningioma (disrupted in balanced translocation) 1
BCL2	chr18	B-cell CLL/lymphoma 2	MN1	chr22	MPL proto-oncogene, thrombopoietin receptor
BCL2L1	chr20	BCL2-like 1	MPL	chr1	MRE11 meiotic recombination 11 homolog A (S. cerevisiae)
BCL2L2	chr14	BCL2-like 2	MRE11A	chr11	mutS homolog 2
BCL3	chr19	B-cell CLL/lymphoma 3	MSH2	chr2	mutS homolog 6
BCL6	chr3	B-cell CLL/lymphoma 6	MSH6	chr2	mechanistic target of rapamycin (serine/threonine kinase)
BCL9	chr1	B-cell CLL/lymphoma 9	MTOR	chr1	5-methyltetrahydrofolate-homocysteine methyltransferase
BCR	chr22	breakpoint cluster region	MTR	chr1	5-methyltetrahydrofolate-homocysteine methyltransferase
BIRC2	chr11	baculoviral IAP repeat containing 2	MTRR	chr5	mucin 1, cell surface associated
BIRC3	chr11	baculoviral IAP repeat containing 3	MUC1	chr1	mutY homolog
BIRC5	chr17	baculoviral IAP repeat containing 5	MUTYH	chr1	v-myb avian myeloblastosis viral oncogene homolog
BLM	chr15	Bloom syndrome, RecQ helicase-like	MYB	chr6	v-myc avian myelocytomatosis viral oncogene homolog
BLNK	chr10	B-cell linker	MYC	chr8	v-myc avian myelocytomatosis viral oncogene lung carcinoma derived homolog
BMPR1A	chr10	bone morphogenetic protein receptor, type IA	MYCL	chr1	v-myc avian myelocytomatosis viral oncogene neuroblastoma derived homolog
BRAF	chr7	B-Raf proto-oncogene, serine/threonine kinase	MYCN	chr2	myeloid differentiation primary response 88
BRD3	chr9	bromodomain containing 3	MYD88	chr3	myosin, heavy chain 11, smooth muscle
BRIP1	chr17	BRCA1 interacting protein C-terminal helicase 1	MYH11	chr16	myosin, heavy chain 9, non-muscle
BTK	chrX	Bruce agammaglobulinemia tyrosine kinase	MYH9	chr22	nibrin
BUB1B	chr15	BUB1 mitotic checkpoint serine/threonine kinase B	NBN	chr8	nuclear receptor coactivator 1
CARD11	chr7	caspase recruitment domain family, member 11	NCOA1	chr2	nuclear receptor coactivator 2
CASC5	chr15	cancer susceptibility candidate 5	NCOA2	chr8	nuclear receptor coactivator 4
CBL	chr11	Cbl proto-oncogene, E3 ubiquitin protein ligase	NCOA4	chr10	neurofibromin 1
CCND1	chr11	cyclin D1	NF1	chr17	neurofibromin 2 (merlin)
CCND2	chr12	cyclin D2	NF2	chr22	nuclear factor, erythroid 2-like 2
CCNE1	chr19	cyclin E1	NFE2L2	chr2	nuclear factor of kappa light polypeptide gene enhancer in B-cells 2 (p49/p100)
CD79A	chr19	CD79a molecule, immunoglobulin-associated alpha	NFKB1	chr4	nuclear factor of kappa light polypeptide gene enhancer in B-cells 2 (p49/p100)
CD79B	chr17	CD79b molecule, immunoglobulin-associated beta	NFKB2	chr10	ninein (GSK3B interacting protein)
CDC73	chr1	cell division cycle 73	NIN	chr14	NK2 homeobox 1
CDH1	chr16	cadherin 1, type 1, E-cadherin (epithelial)	NKX2-1	chr14	NLR family, pyrin domain containing 1
CDH11	chr16	cadherin 11, type 2, OB-cadherin (osteoblast)	NLRP1	chr17	notch 1
CDH2	chr18	cadherin 2, type 1, N-cadherin (neuronal)	NOTCH1	chr9	notch 2
CDH20	chr18	cadherin 20, type 2	NOTCH2	chr1	notch 4
CDH5	chr16	cadherin 5, type 2 (vascular endothelium)	NOTCH4	chr6	nucleophosmin (nucleolar phosphoprotein B23, numatrin)
CDK12	chr17	cyclin-dependent kinase 12	NPM1	chr5	neuroblastoma RAS viral (v-ras) oncogene homolog
CDK4	chr12	cyclin-dependent kinase 4	NRAS	chr1	nuclear receptor binding SET domain protein 1
CDK6	chr7	cyclin-dependent kinase 6	NSD1	chr5	neurotrophic tyrosine kinase, receptor, type 1
CDK8	chr13	cyclin-dependent kinase 8	NTRK1	chr1	neurotrophic tyrosine kinase, receptor, type 3
CDKN2A	chr9	cyclin-dependent kinase inhibitor 2A	NTRK3	chr15	nuclear mitotic apparatus protein 1
CDKN2B	chr9	cyclin-dependent kinase inhibitor 2B (p15, inhibits CDK4)	NUMA1	chr11	nucleoporin 214kDa
CDKN2C	chr1	cyclin-dependent kinase inhibitor 2C (p18, inhibits CDK4)	NUP214	chr9	nucleoporin 98kDa
CEBPA	chr19	CCAAT/enhancer binding protein (C/EBP), alpha	NUP98	chr11	p21 protein (Cdc42/Rac)-activated kinase 3
CHEK1	chr11	checkpoint kinase 1	PAK3	chrX	partner and localizer of BRCA2
CHEK2	chr22	checkpoint kinase 2	PALB2	chr16	poly (ADP-ribose) polymerase 1
CIC	chr19	capicua transcriptional repressor	PARP1	chr1	paired box 3
CKS1B	chr1	CDC28 protein kinase regulatory subunit 1B	PAX3	chr2	paired box 5
CMPK1	chr1	cytidine monophosphate (UMP-CMP) kinase 1, cytosolic	PAX5	chr9	paired box 7
COL1A1	chr17	collagen, type I, alpha 1	PAX7	chr1	paired box 8
CRBN	chr3	cereblon	PAX8	chr2	polybromo 1
CREB1	chr2	cAMP responsive element binding protein 1	PBRM1	chr3	pre-B-cell leukemia homeobox 1
CREBBP	chr16	CREB binding protein	PBX1	chr1	phosphodiesterase 4D interacting protein
CRKL	chr22	v-crk avian sarcoma virus CT10 oncogene homolog-like	PDE4DIP	chr1	platelet-derived growth factor beta polypeptide
CRTC1	chr19	CREB regulated transcription coactivator 1	PDGFB	chr22	platelet-derived growth factor receptor, alpha polypeptide
CSF1R	chr5	colony stimulating factor 1 receptor	PDGFRA	chr4	platelet-derived growth factor receptor, beta polypeptide
CSMD3	chr8	CUB and Sushi multiple domains 3	PDGFRB	chr5	period circadian clock 1
CTNNA1	chr5	catenin (cadherin-associated protein), alpha 1, 102kDa	PER1	chr17	post-GPI attachment to proteins 3
CTNNB1	chr3	catenin (cadherin-associated protein), beta 1, 88kDa	PGAP3	chr17	paired-like homeobox 2b
CYLD	chr16	cyldromatosis (turban tumor syndrome)	PHOX2B	chr4	phosphatidylinositol-4-phosphate 3-kinase, catalytic subunit type 2 beta
CYP2C19	chr10	cytochrome P450, family 2, subfamily C, polypeptide 19	PIK3C2B	chr1	

Name	Chr.	Description	Name	Chr.	Description
CYP2D6	chr22	cytochrome P450, family 2, subfamily D, polypeptide 6	PIK3CA	chr3	phosphatidylinositol-4,5-bisphosphate 3-kinase, catalytic subunit alpha
DAXX	chr6	death-domain associated protein	PIK3CB	chr3	phosphatidylinositol-4,5-bisphosphate 3-kinase, catalytic subunit beta
DCC	chr18	DCC netrin 1 receptor	PIK3CD	chr1	phosphatidylinositol-4,5-bisphosphate 3-kinase, catalytic subunit gamma
DDB2	chr11	damage-specific DNA binding protein 2, 48kDa	PIK3CG	chr7	phosphoinositide-3-kinase, regulatory subunit 1 (alpha)
DDIT3	chr12	DNA-damage-inducible transcript 3	PIK3R1	chr5	phosphoinositide-3-kinase, regulatory subunit 2 (beta)
DDR2	chr1	discoidin domain receptor tyrosine kinase 2	PIK3R2	chr19	Pim-1 proto-oncogene, serine/threonine kinase
DEK	chr6	DEK proto-oncogene	PIM1	chr6	polycystic kidney and hepatic disease 1 (autosomal recessive)
DICER1	chr14	dicer 1, ribonuclease type III	PKHD1	chr6	pleiomorphic adenoma gene 1
DNMT3A	chr2	DNA (cytosine-5-)-methyltransferase 3 alpha	PLAG1	chr8	phospholipase C, gamma 1
DPYD	chr1	dihydropyrimidine dehydrogenase	PLCG1	chr20	pleckstrin homology domain containing, family G (with RhoGef domain) member 5
DST	chr6	dystonin	PLEKHG5	chr1	promyelocytic leukemia
EGFR	chr7	epidermal growth factor receptor	PML	chr15	PMS1 postmeiotic segregation increased 1 (S. cerevisiae)
EML4	chr2	echinoderm microtubule associated protein like 4	PMS1	chr2	PMS2 postmeiotic segregation increased 2 (S. cerevisiae)
EP300	chr22	E1A binding protein p300	PMS2	chr7	protection of telomeres 1
EP400	chr12	E1A binding protein p400	POT1	chr7	POU class 5 homeobox 1
EPHA3	chr3	EPH receptor A3	POU5F1	chr6	peroxisome proliferator-activated receptor gamma
EPHA7	chr6	EPH receptor A7	PPARG	chr3	protein phosphatase 2, regulatory subunit A, alpha
EPHB1	chr3	EPH receptor B1	PPP2R1A	chr19	PR domain containing 1, with ZNF domain
EPHB4	chr7	EPH receptor B4	PRDM1	chr6	protein kinase, cAMP-dependent, regulatory, type I, alpha
EPHB6	chr7	EPH receptor B6	PRKAR1A	chr17	protein kinase, DNA-activated, catalytic polypeptide
ERBB2	chr17	v-erb-b2 avian erythroblastic leukemia viral oncogene homolog	PRKDC	chr8	PC4 and SFRS1 interacting protein 1
ERBB3	chr12	v-erb-b2 avian erythroblastic leukemia viral oncogene homolog	PSIP1	chr9	patched 1
ERBB4	chr2	v-erb-b2 avian erythroblastic leukemia viral oncogene homolog	PTCH1	chr9	phosphatase and tensin homolog
ERCC1	chr19	excision repair cross-complementation group 1	PTEN	chr10	prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase)
ERCC2	chr19	excision repair cross-complementation group 2	PTGS2	chr1	protein tyrosine phosphatase, non-receptor type 11
ERCC3	chr2	excision repair cross-complementation group 3	PTPN11	chr12	protein tyrosine phosphatase, receptor type, D
ERCC4	chr16	excision repair cross-complementation group 4	PTPRD	chr9	protein tyrosine phosphatase, receptor type, T
ERCC5	chr13	excision repair cross-complementation group 5	PTPRT	chr20	RAD50 homolog (S. cerevisiae)
ERG	chr21	v-ets avian erythroblastosis virus E26 oncogene homolog	RAD50	chr5	Raf-1 proto-oncogene, serine/threonine kinase
ESR1	chr6	estrogen receptor 1	RAF1	chr3	ral guanine nucleotide dissociation stimulator
ETS1	chr11	v-ets avian erythroblastosis virus E26 oncogene homolog 1	RALGDS	chr9	retinoic acid receptor, alpha
ETV1	chr7	ets variant 1	RARA	chr17	retinoblastoma 1
ETV4	chr17	ets variant 4	RB1	chr13	RecQ protein-like 4
EXT1	chr8	exostosin glycosyltransferase 1	RECQL4	chr8	v-rel avian reticuloendotheliosis viral oncogene homolog
EXT2	chr11	exostosin glycosyltransferase 2	REL	chr2	ret proto-oncogene
EZH2	chr7	enhancer of zeste 2 polycomb repressive complex 2 subunit	RET	chr10	ras homolog family member H
FANCA	chr16	Fanconi anemia, complementation group A	RHOH	chr4	ribonuclease L (2',5'-oligoadenylate synthetase-dependent)
FANCC	chr9	Fanconi anemia, complementation group C	RNASEL	chr1	ring finger protein 2
FANCD2	chr3	Fanconi anemia, complementation group D2	RNF2	chr1	ring finger protein 213
FANCF	chr11	Fanconi anemia, complementation group F	RNF213	chr17	ROS proto-oncogene 1, receptor tyrosine kinase
FANCG	chr9	Fanconi anemia, complementation group G	ROS1	chr6	ribosomal protein S6 kinase, 90kDa, polypeptide 2
FAS	chr10	Fas cell surface death receptor	RP56KA2	chr6	ribonucleotide reductase M1
FBXW7	chr4	F-box and WD repeat domain containing 7, E3 ubiquitin protein ligase	RRM1	chr11	runt-related transcription factor 1
FGFR1	chr8	fibroblast growth factor receptor 1	RUNX1	chr21	runt-related transcription factor 1; translocated to, 1 (cyclin D-sterile alpha motif domain containing 9)
FGFR2	chr10	fibroblast growth factor receptor 2	RUNX1T1	chr8	Shwachman-Bodian-Diamond syndrome
FGFR3	chr4	fibroblast growth factor receptor 3	SAMD9	chr7	succinate dehydrogenase complex, subunit A, flavoprotein (Fp)
FGFR4	chr5	fibroblast growth factor receptor 4	SBDS	chr7	succinate dehydrogenase complex, subunit B, iron sulfur (lp)
FH	chr1	fumarate hydratase	SDHA	chr5	succinate dehydrogenase complex, subunit C, integral membrane protein, 15kDa
FLCN	chr17	folliculin	SDHB	chr1	succinate dehydrogenase complex, subunit D, integral membrane protein
FLI1	chr11	Fli-1 proto-oncogene, ETS transcription factor	SDHC	chr1	septin 9
FLT1	chr13	fms-related tyrosine kinase 1	SDHD	chr11	SET domain containing 2
FLT3	chr13	fms-related tyrosine kinase 3	SEPT9	chr17	splicing factor 3b, subunit 1, 155kDa
FLT4	chr5	fms-related tyrosine kinase 4	SETD2	chr3	serum/glucocorticoid regulated kinase 1
FN1	chr2	fibronectin 1	SF3B1	chr2	SH2 domain containing 1A
FOXL2	chr3	forkhead box L2	SGK1	chr6	SMAD family member 2
FOXO1	chr13	forkhead box O1	SH2D1A	chrX	SMAD family member 4
FOXO3	chr6	forkhead box O3	SMAD2	chr18	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily a, member 4
FOXP1	chr3	forkhead box P1	SMAD4	chr18	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily b, member 1
FOXP4	chr6	forkhead box P4	SMARCA4	chr19	smoothened, frizzled class receptor
FZR1	chr19	fizzy/cell division cycle 20 related 1 (Drosophila)	SMARCB1	chr22	single-strand-selective monofunctional uracil-DNA glycosylase
G6PD	chrX	glucose-6-phosphate dehydrogenase	SMO	chr7	suppressor of cytokine signaling 1
GATA1	chrX	GATA binding protein 1 (globin transcription factor 1)	SMUG1	chr12	SRY (sex determining region Y)-box 11
GATA2	chr3	GATA binding protein 2	SOC1	chr16	SRY (sex determining region Y)-box 2
GATA3	chr10	GATA binding protein 3	SOX11	chr2	SRC proto-oncogene, non-receptor tyrosine kinase
GDNF	chr5	glial cell derived neurotrophic factor	SOX2	chr3	synovial sarcoma, X breakpoint 1
GNA11	chr19	guanine nucleotide binding protein (G protein), alpha 11 (Gq)	SRC	chr20	serine/threonine kinase 11
GNAQ	chr9	guanine nucleotide binding protein (G protein), q polypeptide	SSX1	chrX	serine/threonine kinase 36
GNAS	chr20	GNAS complex locus	STK11	chr19	suppressor of fused homolog (Drosophila)
GPR124	chr8	G protein-coupled receptor 124	STK36	chr2	spleen tyrosine kinase
GRM8	chr7	glutamate receptor, metabotropic 8	SUFU	chr10	spectrin repeat containing, nuclear envelope 1
GUCY1A2	chr11	guanylate cyclase 1, soluble, alpha 2	SYK	chr9	TAF1 RNA polymerase II, TATA box binding protein (TBP)-associated factor, 250kDa
HCAR1	chr12	hydroxycarboxylic acid receptor 1	SYNE1	chr6	TAF1 RNA polymerase II, TATA box binding protein (TBP)-associated factor, 210kDa-like
HIF1A	chr14	hypoxia inducible factor 1, alpha subunit (basic helix-loop-helix transcription factor)	TAF1	chrX	T-cell acute lymphocytic leukemia 1
HLF	chr17	hepatic leukemia factor	TAF1L	chr9	T-box 22
HNF1A	chr12	HNF1A homeobox A	TAL1	chr1	transcription factor 12
HOOK3	chr8	hook microtubule-tethering protein 3	TBX22	chrX	transcription factor 3
HRAS	chr11	Harvey rat sarcoma viral oncogene homolog	TCF12	chr15	transcription factor 7-like 1 (T-cell specific, HMG-box)
HSP90AA1	chr14	heat shock protein 90kDa alpha (cytosolic), class A member 1	TCF3	chr19	transcription factor 7-like 2 (T-cell specific, HMG-box)
HSP90AB1	chr6	heat shock protein 90kDa alpha (cytosolic), class B member 1	TCF7L1	chr2	T-cell leukemia/lymphoma 1A
ICK	chr6	intestinal cell (MAK-like) kinase	TCF7L2	chr10	tet methylcytosine dioxygenase 1
IDH1	chr2	isocitrate dehydrogenase 1 (NADP+), soluble	TCL1A	chr14	tet methylcytosine dioxygenase 2
IDH2	chr15	isocitrate dehydrogenase 2 (NADP+), mitochondrial	TET1	chr10	transcription factor binding to IGHM enhancer 3
IGF1R	chr15	insulin-like growth factor 1 receptor	TET2	chr4	transforming growth factor, beta receptor II (70/80kDa)
IGF2	chr11	insulin-like growth factor 2	TFE3	chrX	
IGF2R	chr6	insulin-like growth factor 2 receptor	TGFBR2	chr3	

Name	Chr.	Description	Name	Chr.	Description
IKBKB	chr8	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta	TGM7	chr15	transglutaminase 7
IKBKE	chr1	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase epsilon	THBS1	chr15	thrombospondin 1
IKZF1	chr7	IKAROS family zinc finger 1 (Ikaros)	TIMP3	chr22	TIMP metalloproteinase inhibitor 3
IL2	chr4	interleukin 2	TLR4	chr9	toll-like receptor 4
IL21R	chr16	interleukin 21 receptor	TLX1	chr10	T-cell leukemia homeobox 1
IL6ST	chr5	interleukin 6 signal transducer	TNFAIP3	chr6	tumor necrosis factor, alpha-induced protein 3
IL7R	chr5	interleukin 7 receptor	TNFRSF14	chr1	tumor necrosis factor receptor superfamily, member 14
ING4	chr12	inhibitor of growth family, member 4	TNK2	chr3	tyrosine kinase, non-receptor, 2
IRF4	chr6	interferon regulatory factor 4	TOP1	chr20	topoisomerase (DNA) I
IRS2	chr13	insulin receptor substrate 2	TP53	chr17	tumor protein p53
ITGA10	chr1	integrin, alpha 10	TPR	chr1	translocated promoter region, nuclear basket protein
ITGA9	chr3	integrin, alpha 9	TRIM24	chr7	tripartite motif containing 24
ITGB2	chr21	integrin, beta 2 (complement component 3 receptor 3 and 4)	TRIM33	chr1	tripartite motif containing 33
ITGB3	chr17	integrin, beta 3 (platelet glycoprotein IIIa, antigen CD61)	TRIP11	chr14	thyroid hormone receptor interactor 11
JAK1	chr1	Janus kinase 1	TRRAP	chr7	transformation/transcription domain-associated protein
JAK2	chr9	Janus kinase 2	TSC1	chr9	tuberous sclerosis 1
JAK3	chr19	Janus kinase 3	TSC2	chr16	tuberous sclerosis 2
JUN	chr1	jun proto-oncogene	TSHR	chr14	thyroid stimulating hormone receptor
KAT6A	chr8	K(lysine) acetyltransferase 6A	UBR5	chr8	ubiquitin protein ligase E3 component n-recognin 5
KAT6B	chr10	K(lysine) acetyltransferase 6B	UGT1A1	chr2	UDP glucuronosyltransferase family 1 member A1
KDM5C	chrX	lysine (K)-specific demethylase 5C	USP9X	chrX	ubiquitin specific peptidase 9, X-linked
KDM6A	chrX	lysine (K)-specific demethylase 6A	VHL	chr3	von Hippel-Lindau tumor suppressor, E3 ubiquitin protein ligase
KDR	chr4	kinase insert domain receptor (a type III receptor tyrosine)	WAS	chrX	Wiskott-Aldrich syndrome
KEAP1	chr19	kelch-like ECH-associated protein 1	WHSC1	chr4	Wolf-Hirschhorn syndrome candidate 1
KIT	chr4	v-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene	WRN	chr8	Werner syndrome, RecQ helicase-like
KLF6	chr10	Kruppel-like factor 6	WT1	chr11	Wilms tumor 1
KMT2A	chr11	lysine methyltransferase 2A	XPA	chr9	xeroderma pigmentosum, complementation group A
KMT2C	chr7	lysine methyltransferase 2C	XPC	chr3	xeroderma pigmentosum, complementation group C
KMT2D	chr12	lysine methyltransferase 2D	XPO1	chr2	exportin 1
KRAS	chr12	Kirsten rat sarcoma viral oncogene homolog	XRCC2	chr7	X-ray repair complementing defective repair in Chinese hamster cells 2
LAMP1	chr13	lysosomal-associated membrane protein 1	ZNF384	chr12	zinc finger protein 384
			ZNF521	chr18	zinc finger protein 521

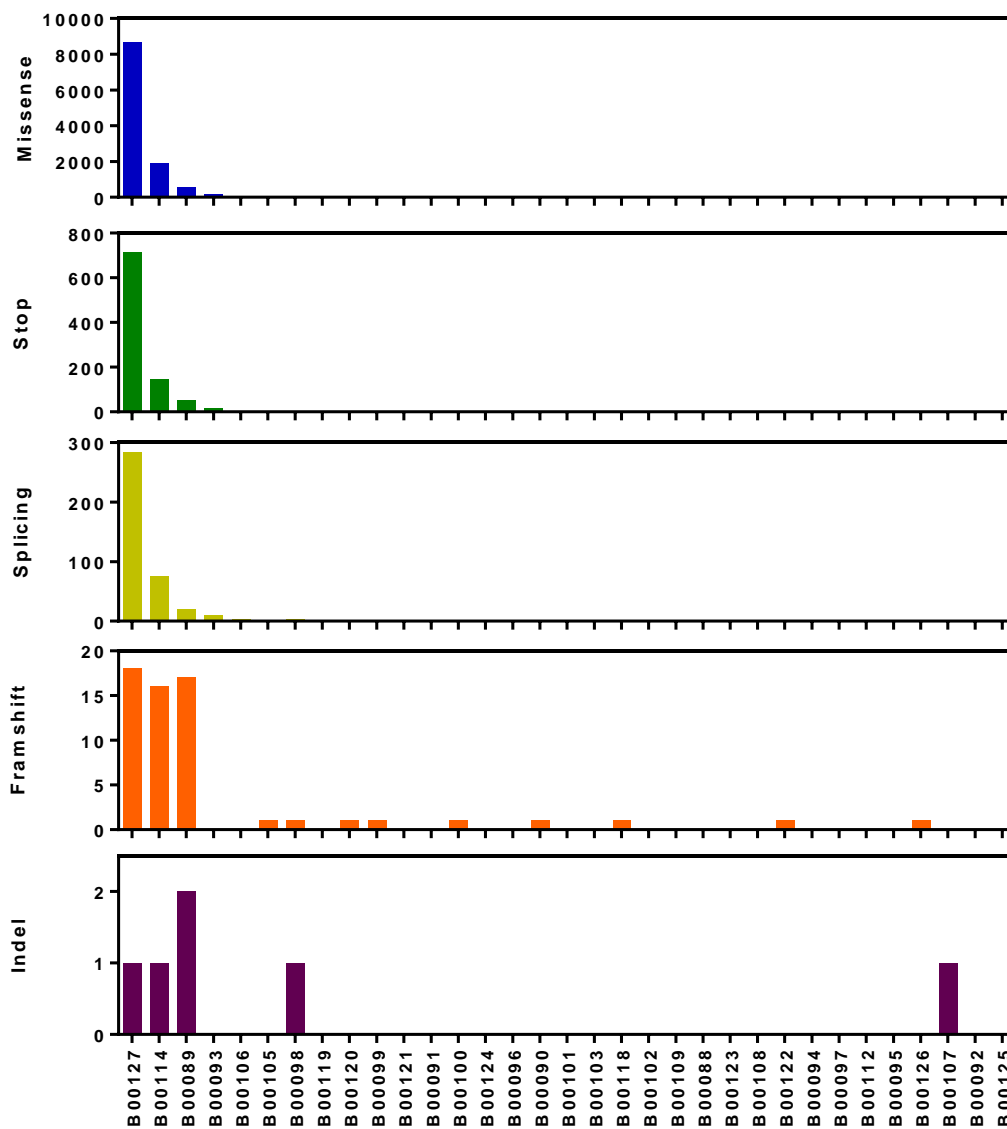
**Supplementary Table S2 Number of variants identified**

Patient	Polymorphisms		Mutations		Total
	Synonymous	Nonsynonymous	Synonymous	Nonsynonymous	
B00088	296	162	10	10	478
B00089	305	144	360	660	1,469
B00090	302	171	6	13	492
B00091	305	161	15	12	493
B00092	308	172	4	2	486
B00093	305	161	104	194	764
B00094	307	174	8	7	496
B00095	306	160	8	5	479
B00096	278	164	9	11	462
B00097	311	151	7	8	477
B00098	302	158	14	27	501
B00099	293	165	11	20	489
B00100	288	182	7	13	490
B00101	318	151	8	11	488
B00102	151	79	10	9	249
B00103	286	161	6	12	465
B00105	298	155	29	29	511
B00106	311	156	28	57	552
B00107	316	159	4	5	484
B00108	291	161	6	8	466
B00109	299	173	7	9	488
B00112	299	169	7	7	482
B00114	314	133	1,096	2,166	3,709
B00118	290	168	6	11	475
B00119	290	157	12	21	480
B00120	283	165	9	20	477
B00121	305	174	12	16	507
B00122	283	156	7	10	456
B00123	297	175	11	9	492
B00124	302	163	12	13	490
B00125	296	155	7	2	460
B00126	258	165	7	7	437
B00127	324	140	4,891	9,727	15,082
<b>Total</b>	<b>9,717</b>	<b>5,240</b>	<b>6,738</b>	<b>13,131</b>	<b>34,826</b>
<b>Average depth</b>	<b>1203.75</b>	<b>1218.37</b>	<b>260.38</b>	<b>665.14</b>	<b>820.35</b>



**Supplementary Figure S1. Profiles of variants identified in this study.**

Top: distribution of the somatic mutations in each HCC sample. Bottom: distribution of polymorphisms in each HCC sample. Types of mutations and polymorphisms were divided into synonymous or nonsynonymous groups.



**Supplementary Figure S2. Spectra of mutations identified in this study.**  
 Number of missense, stop, splicing, frameshift, and indel identified in each HCC tumor.

**A**

**DNA mismatch repair**

Mutator	Non-mutator	Gene	#	%	TCGA
		<i>MLH1</i>	2	7%	0%
		<i>PMS1</i>	2	7%	0%
		<i>PMS2</i>	1	3%	0%

**B**

**Chromatine modification**

Mutator	Non-mutator	Gene	#	%	TCGA
		<i>SETD2</i>	8	27%	5%
		<i>KMT2D</i>	8	27%	0%
		<i>KMT2C</i>	7	23%	0%
		<i>ARID1A</i>	6	20%	3%
		<i>KMT2A</i>	6	20%	0%
		<i>ARID2</i>	5	17%	1%
		<i>KAT6A</i>	4	13%	0%
		<i>KDM6A</i>	3	10%	3%
		<i>KAT6B</i>	3	10%	0%
		<i>CREBBP</i>	3	10%	0%
		<i>NSD1</i>	3	10%	0%
		<i>EP400</i>	2	7%	0%
		<i>KDM5C</i>	2	7%	0%
		<i>ASXL1</i>	1	3%	8%
		<i>PBRM1</i>	1	3%	5%
		<i>SMARCA4</i>	1	3%	3%
		<i>EP300</i>	1	3%	3%
		<i>TRRAP</i>	1	3%	0%
		<i>EZH2</i>	1	3%	0%

**C**

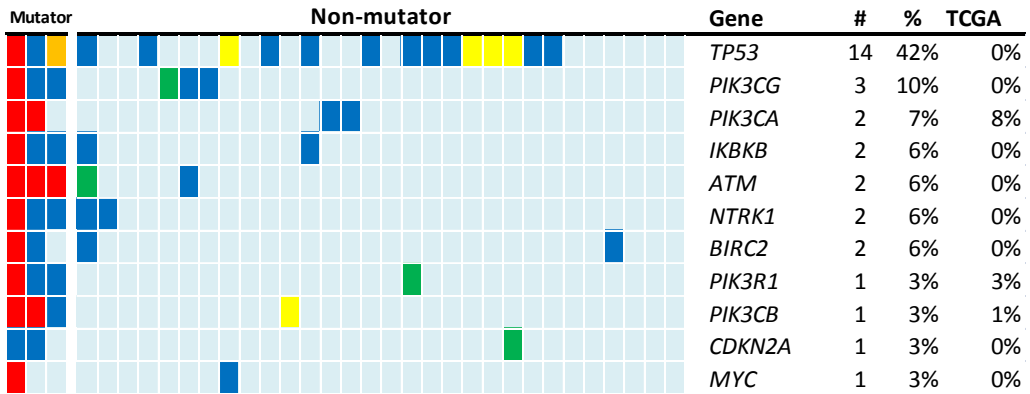
**Cell cycle**

Mutator	Non-mutator	Gene	#	%	TCGA
		<i>TP53</i>	14	47%	35%
		<i>PRKDC</i>	4	13%	3%
		<i>APC</i>	3	10%	0%
		<i>CREBBP</i>	3	10%	0%
		<i>ATM</i>	2	7%	0%
		<i>BUB1B</i>	1	3%	1%
		<i>CDKN2A</i>	1	3%	0%
		<i>CDKN2B</i>	1	3%	0%
		<i>MYC</i>	1	3%	0%



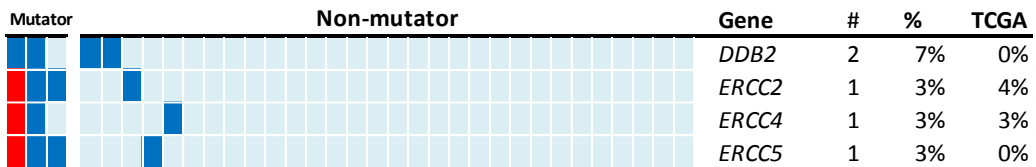
**D**

**Apoptosis**



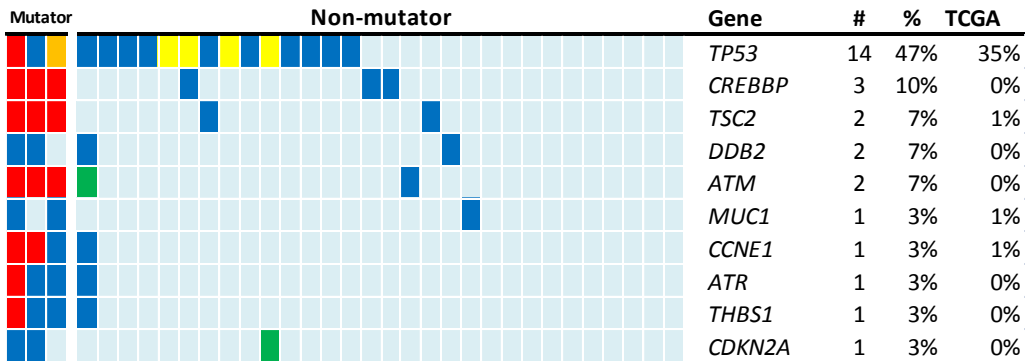
**E**

**Nucleotide excision repair**



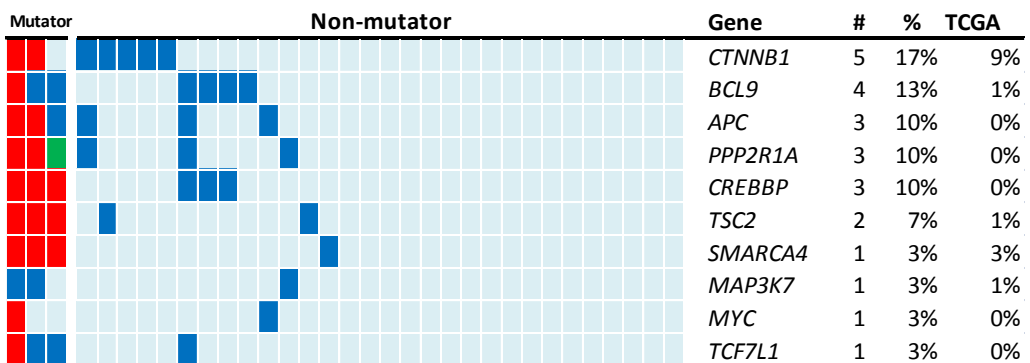
**F**

**p53 signaling pathway**



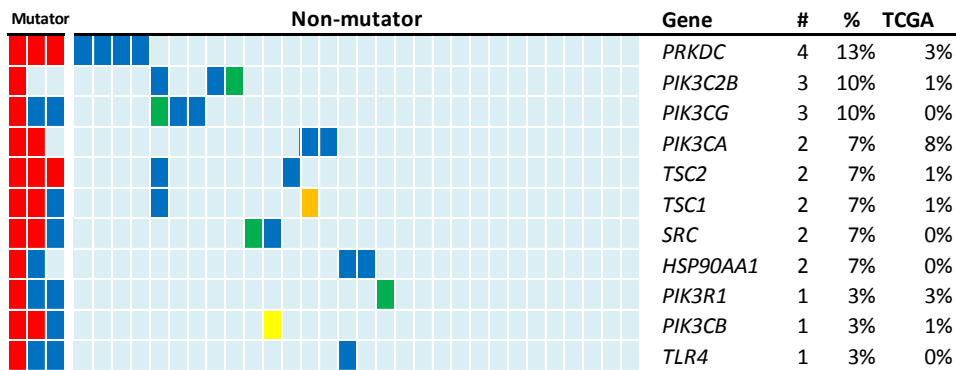
**G**

**Wnt signaling pathway**



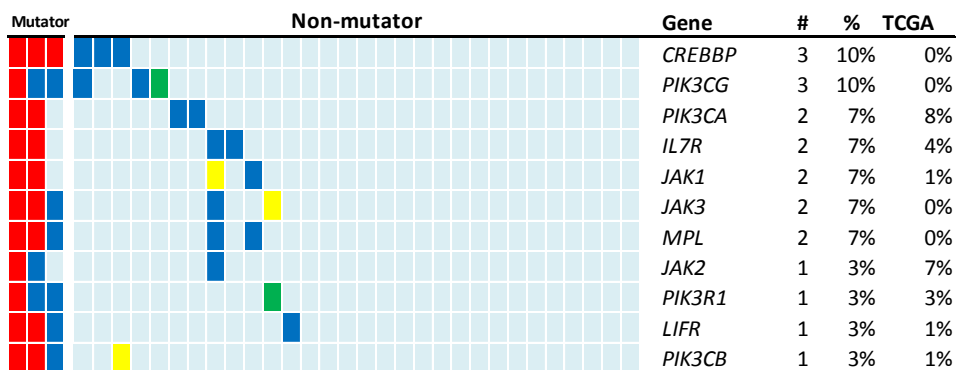
**H**

**PIK3/Ras signaling pathway**



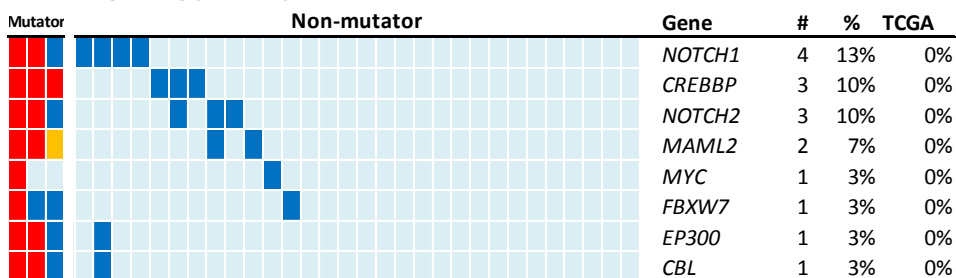
**I**

**JAK/STAT signaling pathway**



**J**

**Notch signaling pathway**



**Supplementary Figure S3 Mutation exclusivity plot of genes relevant to major HCC-related pathways.** Individual mutations in patient samples, color-coded according to the type of mutation. Numbers (#) and percentages (%) represent the fraction of 30 nonmutator tumors with at least one mutation in the specified gene. Major functions of the gene are also listed. Mutation percentages of 75 Asians patients with HBV-associated HCC from the TCGA dataset are also listed.