

Supplementary Table S2 Genomic alterations identified in CCA cells

Cells	Gene	Type	Function Class	Chrom	Pos	Ref Allele	Alt Allele	AA	Transcript	OncoKB*
KKU-097	KRAS	SNP	MISSENSE	chr12	25245348	C	A	G13C	NM_004985	Level 4
KKU-100	KRAS	SNP	MISSENSE	chr12	25398284	C	T	G12D	NM_004985	Level 3
KKU-466	MAP2K4	SNP	MISSENSE	chr17	12125301	G	T	R274I	NM_003010	
KKU-097	PTEN	SNP	MISSENSE	chr10	87864144	G	C	C65S	NM_001304717	
KKU-023	PTEN	SNP	MISSENSE	chr10	87864144	G	C	C65S	NM_001304717	
KKU-452	PTEN	SNP	MISSENSE	chr10	87863959	G	A	G4R	NM_001304717	
KKU-452	PTEN	SNP	MISSENSE	chr10	87864144	G	C	C65S	NM_001304717	
KKU-466	PTEN	SNP	MISSENSE	chr10	87864144	G	C	C65S	NM_001304717	
KKU-610	PTEN	SNP	MISSENSE	chr10	87864144	G	C	C65S	NM_001304717	
KKU-100	PIK3R1	SNP	MISSENSE	chr5	67588148	G	A	M26I	NM_181524	
KKU-023	PIK3CA	SNP	MISSENSE	chr3	179234297	A	G	H1047R	NM_006218	Level 1
KKU-466	PIK3CA	SNP	MISSENSE	chr3	179199088	G	A	R88Q	NM_006218	Level 1
KKU-023	EGF	SNP	MISSENSE	chr4	109980042	G	A	M666I	NM_001178131	
KKU-023	EGF	SNP	MISSENSE	chr4	109961965	G	A	R389K	NM_001178131	
KKU-023	EGF	SNP	MISSENSE	chr4	109980955	A	T	D742V	NM_001178131	
KKU-023	EGF	SNP	MISSENSE	chr4	109993271	A	T	E797V	NM_001357021	
KKU-097	EGF	SNP	MISSENSE	chr4	109980042	G	A	M666I	NM_001178131	
KKU-097	EGF	SNP	MISSENSE	chr4	109993271	A	T	E797V	NM_001357021	
KKU-452	EGF	Insertion	INDEL	chr4	110011233	G	GC	Q1136fs*18	NM_001178130	
KKU-452	EGF	SNP	MISSENSE	chr4	109980042	G	A	M666I	NM_001178131	
KKU-452	EGF	SNP	MISSENSE	chr4	109993271	A	T	E797V	NM_001357021	

Cells	Gene	Type	Function Class	Chrom	Pos	Ref Allele	Alt Allele	AA	Transcript	OncoKB*
KKU-466	EGF	Insertion	INDEL	chr4	110011233	G	GC	Q1136fs*18	NM_001178130	
KKU-466	EGF	SNP	MISSENSE	chr4	109980042	G	A	M666I	NM_001178131	
KKU-466	EGF	SNP	MISSENSE	chr4	109993271	A	T	E797V	NM_001357021	
KKU-610	EGF	SNP	MISSENSE	chr4	109980042	G	A	M666I	NM_001178131	
KKU-610	EGF	SNP	MISSENSE	chr4	109961965	G	A	R389K	NM_001178131	
KKU-610	EGF	SNP	MISSENSE	chr4	109993271	A	T	E797V	NM_001357021	
KKU-023	ARID1A	Insertion	INDEL	chr1	26779439	T	TG	D1850Gfs*4	NM_006015	Level 4
KKU-452	ARID1A	Insertion	INDEL	chr1	26774936	C	CT	N1571*	NM_006015	Level 4
KKU-466	ARID1A	SNP	MISSENSE	chr1	26780592	C	T	R2015W	NM_139135	
KKU-097	IDH1	SNP	MISSENSE	chr2	208239988	C	A	G289V	NM_001282386	
KKU-023	ARID2	Deletion	INDEL	chr12	45836771	CTT	C		NM_001347839	
KKU-466	ARID2	SNP	MISSENSE	chr12	45852423	G	T	A1434S	NM_001347839	
KKU-023	NCOR1	SNP	NONSENSE	chr17	16117929	G	A	R563*	NM_001190438	
KKU-023	TET1	SNP	MISSENSE	chr10	68646098	A	G	I1123M	NM_030625	
KKU-097	TET1	SNP	MISSENSE	chr10	68646098	A	G	I1123M	NM_030625	
KKU-097	TET1	SNP	MISSENSE	chr10	68572823	A	G	D162G	NM_030625	
KKU-452	TET1	SNP	MISSENSE	chr10	68646098	A	G	I1123M	NM_030625	
KKU-452	TET1	SNP	MISSENSE	chr10	68572823	A	G	D162G	NM_030625	
KKU-466	TET1	SNP	MISSENSE	chr10	68646098	A	G	I1123M	NM_030625	
KKU-466	TET1	SNP	MISSENSE	chr10	68572915	T	A	S193T	NM_030625	
KKU-610	TET1	SNP	MISSENSE	chr10	68646098	A	G	I1123M	NM_030625	
KKU-610	TET1	SNP	MISSENSE	chr10	68572823	A	G	D162G	NM_030625	
KKU-100	TET1	SNP	MISSENSE	chr10	70405855	A	G	I1123M	NM_030625	
KKU-100	TET1	SNP	MISSENSE	chr10	70332580	A	G	D162G	NM_030625	

Cells	Gene	Type	Function Class	Chrom	Pos	Ref Allele	Alt Allele	AA	Transcript	OncoKB*
KKU-466	EZH2	SNP	MISSENSE	chr7	148828812	C	G	D146H	NM_152998	
KKU-100	EZH2	SNP	MISSENSE	chr7	148525904	C	G	D146H	NM_152998	
KKU-023	ARID4A	Insertion	INDEL	chr14	58359192	G	GA	Q641Tfs*6	NM_002892	
KKU-023	ARID4A	SNP	MISSENSE	chr14	58364424	A	G	T779A	NM_002892	
KKU-097	ARID4A	SNP	MISSENSE	chr14	58364424	A	G	T779A	NM_002892	
KKU-100	ARID4A	SNP	MISSENSE	chr14	58831142	A	G	T779A	NM_023001	
KKU-097	EGFR	SNP	MISSENSE	chr7	55161562	G	A	R254K	NM_001346941	
KKU-452	EGFR	SNP	MISSENSE	chr7	55161562	G	A	R254K	NM_001346941	
KKU-466	EGFR	SNP	MISSENSE	chr7	55161562	G	A	R254K	NM_001346941	
KKU-610	EGFR	SNP	MISSENSE	chr7	55161562	G	A	R254K	NM_001346941	
KKU-100	EGFR	SNP	MISSENSE	chr7	55229255	G	A	R468K	NM_001346941	
KKU-023	TP53	SNP	MISSENSE	chr17	7676154	G	C	P33R	NM_001126118	
KKU-097	TP53	SNP	MISSENSE	chr17	7676154	G	C	P33R	NM_001126118	
KKU-097	TP53	SNP	MISSENSE	chr17	7674212	T	A	I119F	NM_001126115	
KKU-452	TP53	SNP	NONSENSE	chr17	7670664	C	A	E190*	NM_001276697	
KKU-452	TP53	SNP	MISSENSE	chr17	7676154	G	C	P33R	NM_001126118	
KKU-466	TP53	Insertion	INDEL	chr17	7676202	T	TTAGT GAAC	E56fs*73, D57fs*72	NM_000546	
KKU-466	TP53	SNP	MISSENSE	chr17	7676154	G	C	P33R	NM_001126118	
KKU-610	TP53	SNP	NONSENSE	chr17	7670703	C	A	E177*	NM_001276697	
KKU-100	TP53	SNP	MISSENSE	chr17	7579472	G	C	P72R	NM_000546	
KKU-023	MSH6	SNP	MISSENSE	chr2	47783349	G	A	G39E	NM_000179	
KKU-097	MSH6	SNP	MISSENSE	chr2	47783349	G	A	G39E	NM_000179	
KKU-610	MSH6	SNP	MISSENSE	chr2	47783349	G	A	G39E	NM_000179	
KKU-100	MSH6	SNP	MISSENSE	chr2	48010488	G	A	G39E	NM_000179	

Cells	Gene	Type	Function Class	Chrom	Pos	Ref Allele	Alt Allele	AA	Transcript	OncoKB*
KKU-023	BARD1	SNP	MISSENSE	chr2	214767532	A	G	M237T	NR_104216	
KKU-023	BARD1	SNP	MISSENSE	chr2	214767531	C	T	V488M	NM_001282543	
KKU-023	BARD1	SNP	MISSENSE	chr2	214780740	C	G	R359S	NM_001282543	
KKU-023	BARD1	SNP	MISSENSE	chr2	214809500	G	A	P24S	NM_000465	
KKU-097	BARD1	SNP	MISSENSE	chr2	214767532	A	G	M237T	NR_104216	
KKU-097	BARD1	SNP	MISSENSE	chr2	214780821	C	G	R330P	NR_104215	
KKU-452	BARD1	SNP	MISSENSE	chr2	214767532	A	G	M237T	NR_104216	
KKU-452	BARD1	SNP	MISSENSE	chr2	214780821	C	G	R330P	NR_104215	
KKU-466	BARD1	SNP	MISSENSE	chr2	214767532	A	G	M237T	NR_104216	
KKU-610	BARD1	SNP	MISSENSE	chr2	214767532	A	G	M237T	NR_104216	
KKU-610	BARD1	SNP	MISSENSE	chr2	214780821	C	G	R330P	NR_104215	
KKU-023	MSH3	Insertion	INDEL	chr5	80675095	C	CA	N385Qfs*19	NM_002439	
KKU-023	MSH3	SNP	MISSENSE	chr5	80654905	G	C	A60P	NM_002439	
KKU-023	MSH3	SNP	MISSENSE	chr5	80654962	A	G	I79V	NM_002439	
KKU-023	MSH3	SNP	MISSENSE	chr5	80854162	A	G	Q949R	NM_002439	
KKU-097	MSH3	SNP	MISSENSE	chr5	80678960	G	A	D403N	NM_002439	
KKU-097	MSH3	SNP	MISSENSE	chr5	80654962	A	G	I79V	NM_002439	
KKU-097	MSH3	SNP	MISSENSE	chr5	80854162	A	G	Q949R	NM_002439	
KKU-097	MSH3	SNP	MISSENSE	chr5	80873118	G	A	A1045T	NM_002439	
KKU-452	MSH3	SNP	MISSENSE	chr5	80854162	A	G	Q949R	NM_002439	
KKU-452	MSH3	SNP	MISSENSE	chr5	80654905	G	C	A60P	NM_002439	
KKU-466	MSH3	SNP	MISSENSE	chr5	80854162	A	G	Q949R	NM_002439	
KKU-466	MSH3	SNP	MISSENSE	chr5	80654962	A	G	I79V	NM_002439	
KKU-466	MSH3	SNP	MISSENSE	chr5	80873118	G	A	A1045T	NM_002439	

Cells	Gene	Type	Function Class	Chrom	Pos	Ref Allele	Alt Allele	AA	Transcript	OncoKB*
KKU-610	MSH3	SNP	MISSENSE	chr5	80854162	A	G	Q949R	NM_002439	
KKU-610	MSH3	SNP	MISSENSE	chr5	80654962	A	G	I79V	NM_002439	
KKU-610	MSH3	SNP	MISSENSE	chr5	80873118	G	A	A1045T	NM_002439	
KKU-097	SMAD4	Insertion	INDEL	chr18	51048751	C	CA	N107Kfs*2	NM_005359	
KKU-023	SMAD4	Insertion	INDEL	chr18	51058143	T	TG	S232Qfs*3	NM_005359	
KKU-023	APC	SNP	MISSENSE	chr5	112841059	T	A	V1539D	NM_001354906	
KKU-097	APC	SNP	MISSENSE	chr5	112841059	T	A	V1539D	NM_001354906	
KKU-452	APC	SNP	MISSENSE	chr5	112841059	T	A	V1539D	NM_001354906	
KKU-610	APC	SNP	MISSENSE	chr5	112841059	T	A	V1539D	NM_001354906	
KKU-100	APC	SNP	MISSENSE	chr5	112176756	T	A	V1822D	NM_001354906	
KKU-023	RNF43	SNP	MISSENSE	chr17	58415439	T	C	I47V	NM_001305544	
KKU-023	RNF43	SNP	MISSENSE	chr17	58358524	G	T	L291M	NM_001305545	
KKU-023	RNF43	SNP	MISSENSE	chr17	58370936	C	T	R117H	NM_001305544	
KKU-097	RNF43	SNP	MISSENSE	chr17	58415439	T	C	I47V	NM_001305544	
KKU-452	RNF43	SNP	MISSENSE	chr17	58415439	T	C	I47V	NM_001305544	
KKU-452	RNF43	SNP	MISSENSE	chr17	58358524	G	T	L291M	NM_001305545	
KKU-610	RNF43	SNP	MISSENSE	chr17	58415439	T	C	I47V	NM_001305544	
KKU-610	RNF43	SNP	MISSENSE	chr17	58358524	G	T	L291M	NM_001305545	
KKU-100	RNF43	SNP	MISSENSE	chr17	56492800	T	C	I47V	NM_001305544	
KKU-023	AFF3	SNP	MISSENSE	chr2	99594180	T	C	N494S	NM_002285	
KKU-452	AFF3	Deletion	INDEL	chr2	99593872	CGGCTGA	C	SA595-	NM_002285	
KKU-452	AFF3	SNP	MISSENSE	chr2	99593880	G	C	T594S	NM_002285	
KKU-466	AFF3	Deletion	INDEL	chr2	99593872	CGGCTGA	C	SA595-	NM_002285	
KKU-466	AFF3	SNP	MISSENSE	chr2	99593880	G	C	T594S	NM_002285	

Cells	Gene	Type	Function Class	Chrom	Pos	Ref Allele	Alt Allele	AA	Transcript	OncoKB*
KKU-023	AFF4	SNP	NONSENSE	chr5	132934266	C	A	E267*	NM_014423	
KKU-097	AFF4	SNP	MISSENSE	chr5	132893075	G	A	T784M	NM_014423	
KKU-466	CTNNB1	SNP	MISSENSE	chr3	41224622	C	T	S30F	NM_001330729	
KKU-452	CDKN1B	SNP	MISSENSE	chr12	12718165	T	G	V109G	NM_004064	
KKU-610	CDKN1B	SNP	MISSENSE	chr12	12718114	C	T	P92L	NM_004064	
KKU-023	ATR	Insertion	INDEL	chr3	142555897	A	AT	I774Nfs*3	NM_001184	Level 1
KKU-023	ATR	SNP	MISSENSE	chr3	142562770	A	G	M211T	NM_001184	
KKU-452	ATR	SNP	MISSENSE	chr3	142562770	A	G	M211T	NM_001184	
KKU-610	ATR	SNP	MISSENSE	chr3	142562770	A	G	M211T	NM_001184	
KKU-100	ATR	SNP	MISSENSE	chr3	142281612	A	G	M211T	NM_001184	
KKU-023	BRCA1	SNP	NONSENSE	chr17	43093449	G	A	R740*	NR_027676	Likely oncogenic
KKU-023	BRCA1	SNP	MISSENSE	chr17	43071077	T	C	S1566G	NM_007297	
KKU-023	BRCA1	SNP	MISSENSE	chr17	43082453	A	G	F1482L	NR_027676	
KKU-023	BRCA1	SNP	MISSENSE	chr17	43091983	T	C	K1136R	NM_007297	
KKU-023	BRCA1	SNP	MISSENSE	chr17	43092418	T	C	E1038G	NM_007294	
KKU-023	BRCA1	SNP	MISSENSE	chr17	43092919	G	A	P824L	NM_007297	
KKU-023	BRCA1	SNP	MISSENSE	chr17	43093220	A	G	I816T	NR_027676	
KKU-097	BRCA1	SNP	NONSENSE	chr17	43093449	G	A	R740*	NR_027676	Likely oncogenic
KKU-097	BRCA1	SNP	MISSENSE	chr17	43071077	T	C	S1566G	NM_007297	
KKU-097	BRCA1	SNP	MISSENSE	chr17	43082453	A	G	F1482L	NR_027676	
KKU-097	BRCA1	SNP	MISSENSE	chr17	43091983	T	C	K1136R	NM_007297	
KKU-097	BRCA1	SNP	MISSENSE	chr17	43092418	T	C	E1038G	NM_007294	
KKU-097	BRCA1	SNP	MISSENSE	chr17	43092919	G	A	P824L	NM_007297	
KKU-097	BRCA1	SNP	MISSENSE	chr17	43093220	A	G	I816T	NR_027676	

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KKU-610	BRCA1	SNP	NONSENSE	chr17	43093449	G	A	R740*	NR_027676	Likely oncogene
KKU-610	BRCA1	SNP	MISSENSE	chr17	43071077	T	C	S1566G	NM_007297	
KKU-610	BRCA1	SNP	MISSENSE	chr17	43082453	A	G	F1482L	NR_027676	
KKU-610	BRCA1	SNP	MISSENSE	chr17	43091983	T	C	K1136R	NM_007297	
KKU-610	BRCA1	SNP	MISSENSE	chr17	43092418	T	C	E1038G	NM_007294	
KKU-610	BRCA1	SNP	MISSENSE	chr17	43092919	G	A	P824L	NM_007297	
KKU-610	BRCA1	SNP	MISSENSE	chr17	43093220	A	G	I816T	NR_027676	
KKU-100	BRCA1	SNP	MISSENSE	chr17	41244936	G	A	P575L	NM_007294	
KKU-100	BRCA1	SNP	MISSENSE	chr17	41222975	C	T	M1356I	NM_007294	
KKU-100	BRCA1	SNP	MISSENSE	chr17	41223094	T	C	S1317G	NM_007294	
KKU-100	BRCA1	SNP	MISSENSE	chr17	41244000	T	C	K1183R	NM_007294	
KKU-100	BRCA1	SNP	MISSENSE	chr17	41244435	T	C	E1038G	NM_007294	
KKU-023	KMT2C	Insertion	INDEL	chr7	152247986	G	GT	Y816*	NM_170606	
KKU-023	KMT2C	SNP	MISSENSE	chr7	152247922	C	T	G838S	NM_170606	
KKU-023	KMT2C	SNP	MISSENSE	chr7	152248119	G	A	S772L	NM_170606	
KKU-023	KMT2C	SNP	MISSENSE	chr7	152273771	T	A	T316S	NM_170606	
KKU-097	KMT2C	Insertion	INDEL	chr7	152247986	G	GT	Y816*	NM_170606	
KKU-097	KMT2C	SNP	MISSENSE	chr7	152229936	C	A	C988F	NM_170606	
KKU-097	KMT2C	SNP	MISSENSE	chr7	152247922	C	T	G838S	NM_170606	
KKU-097	KMT2C	SNP	MISSENSE	chr7	152248119	G	A	S772L	NM_170606	
KKU-097	KMT2C	SNP	MISSENSE	chr7	152273771	T	A	T316S	NM_170606	
KKU-452	KMT2C	Insertion	INDEL	chr7	152247986	G	GT	Y816*	NM_170606	
KKU-452	KMT2C	SNP	MISSENSE	chr7	152247922	C	T	G838S	NM_170606	
KKU-452	KMT2C	SNP	MISSENSE	chr7	152248119	G	A	S772L	NM_170606	

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KKU-466	KMT2C	Insertion	INDEL	chr7	152247986	G	GT	Y816*	NM_170606	
KKU-466	KMT2C	SNP	MISSENSE	chr7	152162203	G	T	Q3792K	NM_170606	
KKU-466	KMT2C	SNP	MISSENSE	chr7	152247922	C	T	G838S	NM_170606	
KKU-466	KMT2C	SNP	MISSENSE	chr7	152248119	G	A	S772L	NM_170606	
KKU-466	KMT2C	SNP	MISSENSE	chr7	152273771	T	A	T316S	NM_170606	
KKU-610	KMT2C	Insertion	INDEL	chr7	152247986	G	GT	Y816*	NM_170606	
KKU-610	KMT2C	SNP	MISSENSE	chr7	152162598	G	A	S3660L	NM_170606	
KKU-610	KMT2C	SNP	MISSENSE	chr7	152229936	C	A	C988F	NM_170606	
KKU-610	KMT2C	SNP	MISSENSE	chr7	152247922	C	T	G838S	NM_170606	
KKU-610	KMT2C	SNP	MISSENSE	chr7	152248119	G	A	S772L	NM_170606	
KKU-097	ELF3	Insertion	INDEL	chr1	202015320	C	CT	*372Lfs*99	NM_001114309	
KKU-097	PDK1	SNP	MISSENSE	chr2	172565014	C	G	L272V	NR_103729	
KKU-023	PDK1	SNP	MISSENSE	chr2	172556161	C	T	R65C	NR_103729	
KKU-100	PDK1	SNP	MISSENSE	chr2	173429331	C	T	P16S	NM_002610	
KKU-023	POLE	SNP	NONSENSE	chr12	132657184	G	C	Y1178*	NM_006231	
KKU-466	POLE	SNP	MISSENSE	chr12	132675739	C	A	D368Y	NM_006231	

* Data was retrieved from OncoKB database on May 23rd, 2024