

Isogenic Human Cell Lines

Patient-relevant, isogenic somatic models of human genetic diseases



Genome

rAAV precision genome editing
(GENESIS™)

Modelling the genetic variations
that define disease phenotype,
drug response & resistance

Translation

rAAV precision genome editing
(GENESIS™)

Dissecting disease biology

Drug target, biomarker ID &
validation

Human Cellular Disease Models

Gene-**X**, Mutant **A**nd Normal
isogenic cell lines (**X-MAN™**)

Drug target, biomarker ID &
validation

Drug screening

A company committed to supporting translational research

Translating Genomes | Personalizing Medicines

Tumour Microenvironment

Assay development & drug screening

Suite of specialist cellular assays including hypoxia, 3D spheroid, senescence, autophagy & reactive oxygen species

Endogenous somatic mutation placed under selective pressure to illicit true disease phenotypes & drug responses

Right Drug - Right Patient

X-MAN™ surrogate patient profiling

Predicting patients for selection in clinical trials

Dx Reagents

gDNA & FFPE blocks

Reference standards for Molecular Dx

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Off-The-Shelf Cell Lines

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Genotype	Cell Line	Description	Catalogue ID
AKT1 and 2			
AKT1 (-/-)	DLD-1	Homozygous knock-out of AKT1	HD R00-001
AKT2 (-/-)	DLD-1	Homozygous knock-out of AKT2	HD R00-002
AKT1 (-/-); AKT2 (-/-)	DLD-1	Double homozygous knock-out of AKT1 and AKT2	HD R00-003
AKT1 (-/-)	HCT116	Homozygous knock-out of AKT1	HD R02-004
AKT2 (-/-)	HCT116	Homozygous knock-out of AKT2	HD R02-005
AKT1 (E17K/+)	MCF10A	Heterozygous knock-in of AKT1 PH domain activating mutation	HD 101-007
APOC1			
APOC1 (-/-)	HCT116	Homozygous knock-out of APOC1	HD R02-007
ATR			
ATR (a2101g/a2101g); p53 (+/sil)	DLD-1	Homozygous hypomorphic ATR mutation (Seckel); knock-in of wild type p53	HD 202-001
ATR (a2101g/a2101g); p53 (S241F/sil)	DLD-1	Homozygous hypomorphic ATR mutation (Seckel); p53 mutant (S241F) background	HD 105-010
ATR (a2101g/+); p53 (S241F/sil)	DLD-1	Heterozygous hypomorphic ATR mutation (Seckel); p53 mutant (S241F) background	HD R00-025
β-Catenin			
β -Catenin (+/-)	HCT116	Knock-out of β -Catenin mutant allele (Δ 45) in heterozygous parental cells	HD 104-009
β -Catenin (Δ 45/-)	HCT116	Knock-out of β -Catenin wild type allele in heterozygous parental cells	HD 104-010
β -Catenin (T41A/+)	MCF10A	Heterozygous knock-in of β -Catenin activating mutation	HD 101-009
BAX			
BAX (-/-)	HCT116	Homozygous knock-out of BAX	HD R02-008
BAX (-/-); p21 (-/-)	HCT116	Double homozygous knock-out of BAX and p21	HD R02-010
Baz2a			
Baz2a (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Baz2a	HD 115-004
BLM			
BLM (-/-)	HCT116	Homozygous knock-out of BLM	HD R02-011
B-Raf			
B-Raf (-/-)	DLD-1	Homozygous knock-out of B-Raf	HD R00-004
B-Raf (-/-)	HCT116	Homozygous knock-out of B-Raf	HD R02-012
B-Raf (V600K/+)	HCT116	Heterozygous knock-in of B-Raf activating mutation (V600K)	HD 104-022
B-Raf (V600E/+)	HME	Heterozygous knock-in of B-Raf activating mutation	HD 100-005
B-Raf (V600E/+); EGFR (Δ E746-A750/+)	HME	Double heterozygous knock-in of B-Raf and EGFR activating mutations	HD 200-002
B-Raf (V600E/+)	MCF10A	Heterozygous knock-in of B-Raf activating mutation	HD 101-012
B-Raf (V600K/+)	MCF10A	Heterozygous knock-in of B-Raf activating mutation (V600K)	HD 101-015
B-Raf (+/-/-)	RKO	Knock-out of both mutant B-Raf alleles (V600E) in triploid parental cells	HD 106-003
B-Raf (V600E/-/-)	RKO	Knock-out of wild type allele and one mutant B-Raf allele (V600E) in triploid parental cells	HD 106-004
B-Raf (V600E ^{CBP-3xFlag} /V600E/+)	RKO	Heterozygous CBP-3xFlag-tagged endogenous wild type B-Raf	HD 115-026
B-Raf (+ ^{CBP-3xFlag} /V600E/V600E)	RKO	Heterozygous CBP-3xFlag-tagged endogenous mutant B-Raf	HD 115-027
B-Raf (+/V600E/-)	RKO	Knock-out of single mutant B-Raf allele (V600E) in triploid parental cells	HD R05-012
B-Raf (V600E/+)	SW48	Heterozygous knock-in of B-Raf activating mutation	HD 103-003
B-Raf (V600E/-)	VACO432	Heterozygous knock-out of wild type B-Raf	HD 107-002
BRCA2			
BRCA2 (-/-)	DLD-1	Homozygous knock-out of BRCA2	HD 105-007
BRCA2 (S3291E/-)	DLD-1	Heterozygous knock-in of BRCA2 hypomorphic point mutation and knock-out of wild type allele	HD 105-009
BRCA2 (Y3308X/-)	DLD-1	Heterozygous knock-in of BRCA2 inactivating point mutation and knock-out of wild type allele	HD 105-008
CDC4			
CDC4 (Δ exon5/ Δ exon5)	DLD-1	Homozygous knock-out of CDC4 exon 5 which encodes F-box domain of the protein	HD R00-005
CDC4 (Δ exon5/+)	DLD-1	Heterozygous knock-out of CDC4 exon 5 which encodes F-box domain of the protein	HD R00-006
CDC4 (Δ exon5/ Δ exon5)	HCT116	Homozygous knock-out of CDC4 exon 5 which encodes F-box domain of the protein	HD R02-013
CDK2			
CDK2 (-/-)	HCT116	Homozygous knock-out of CDK2	HD R02-015
CDK2 (-/-); p53 (-/-)	HCT116	Double homozygous knock-out of CDK2 and p53	HD R02-016
CHD2			
CHD2 (+ ^{CBP-3xFlag} /+)	DLD-1	Heterozygous CBP-3xFlag-tagged endogenous CHD2	HD 115-035
CHK1 and CHK2			
CHK1 (S317A/-); p53 (S241F/sil)	DLD-1	Heterozygous knock-in of phosphorylation site mutant and knock-out of wild type CHK1; p53 (S241F) mutant background	HD R00-007
CHK1 (+/-); p53 (-/-)	HCT116	Heterozygous knock-out of CHK1; p53 null background	HD R02-078
CHK1 (+/-); p53 (+/+)	HCT116	Heterozygous knock-out of CHK1; p53 wild type background	HD R02-077
CHK2 (-/-); p53 (-/-)	HCT116	Homozygous knock-out of CHK2; p53 null background	HD R02-018
CHK2 (-/-); p53 (+/+)	HCT116	Homozygous knock-out of CHK2; p53 wild type background	HD R02-017



Off-The-Shelf Cell Lines

Genotype	Cell Line	Description	Catalogue ID
Dot1L			
Dot1L (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Dot1L	HD 115-006
DEC1			
DEC1 (-/-)	HACAT	Homozygous knock-out of DEC1	HD R01-001
Dicer			
Dicer (Δ HD/ Δ HD)	DLD-1	Homozygous disruption of Dicer exon 5 helicase domain	HD R00-009
Dicer (Δ HD/ Δ HD)	HCT116	Homozygous disruption of Dicer exon 5 helicase domain	HD R02-019
Dicer (Δ HD/ Δ HD)	RKO	Homozygous disruption of Dicer exon 5 helicase domain	HD R05-001
DNA-PKcs			
DNA-PKcs (-/-)	HCT116	Homozygous knock-out of DNA-PKcs	HD R02-049
DNA-PKcs (-/-); Ku70 (+/-)	HCT116	Homozygous knock-out of DNA-PKcs; heterozygous knock-out of Ku70	HD R02-051
DNA-PKcs (+/-)	HCT116	Heterozygous knock-out of DNA-PKcs	HD R02-048
DNA-PKcs (-/-)	HCT116	Homozygous knock-out of DNA-PKcs	HD R02-049
DNMT family			
DNMT1 (Δ exons3-5/ Δ exons3-5)	HCT116	Homozygous knock-out of DNMT1 exons 3-5 encoding PCNA binding domain	HD R02-020
DNMT1 (Δ exons3-5/+)	HCT116	Heterozygous knock-out of DNMT1 exons 3-5 encoding PCNA binding domain	HD R02-021
DNMT3b (-/-)	HCT116	Homozygous knock-out of DNMT3b	HD R02-023
DNMT1 (Δ exons3-5/ Δ exons3-5); DNMT3b (-/-)	HCT116	Double homozygous knock-out of DNMT1 exons 3-5 encoding PCNA binding domain and DNMT3b	HD R02-022
DNMT1 (Δ exons3-5/ Δ exons3-5); DNMT3b (-/-); p16INK4A (R24fs*20/-)	HCT116	Double homozygous knock-out of DNMT1 exons 3-5 and DNMT3b; heterozygous knock-out of wild type p16INK4A allele in heterozygous parental cells	HD R02-024
DNMT1 (Δ exons3-5/ Δ exons3-5); DNMT3b (-/-); p16INK4A (sil/-)	HCT116	Double homozygous knock-out of DNMT1 exons 3-5 and DNMT3b; heterozygous knock-out of frameshift mutant (R24fs*20) p16INK4A allele in heterozygous parental cells	HD R02-025
DNMT1 (Δ exons3-5/+); DNMT3b (-/-); p16INK4A (R24fs*20/-)	HCT116	Heterozygous knock-out of DNMT1 exons 3-5; homozygous knock-out of DNMT3b; heterozygous knock-out of wild type p16INK4A allele in heterozygous parental cells	HD R02-026
DNMT1 (Δ exons3-5/+); DNMT3a (-/-); DNMT3b (-/-); p16INK4A (R24fs*20/-)	HCT116	Heterozygous knock-out of DNMT1 exons 3-5; double homozygous knock-out of DNMT3a and DNMT3b; heterozygous knock-out of wild type p16INK4A allele in heterozygous parental cells	HD R02-027
E2f1			
E2f1 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous E2f1	HD 115-009
EGFR			
EGFR (Δ E746-A750/+)	HME	Heterozygous knock-in of EGFR activating mutation	HD 100-001
EGFR (Δ E746-A750/+); B-Raf (V600E/+)	HME	Double heterozygous knock-in of EGFR and B-Raf activating mutations	HD 200-002
EGFR (Δ E746-A750/+); PI3Ka (H1047R/+)	HME	Double heterozygous knock-in of EGFR and PI3Ka activating mutations	HD 200-001
EGFR (Δ E746-A750/+)	MCF10A	Heterozygous knock-in of EGFR activating mutation	HD 101-010
EGFR (Δ E746-A750/+); PI3Ka (H1047R/+)	MCF10A	Double heterozygous knock-in of EGFR and PI3Ka activating mutations	HD 201-001
EGFR (L861Q/+)	MCF10A	Heterozygous knock-in of EGFR activating mutation (L861Q)	HD 101-017
EGFR (L858R/+)	MCF10A	Heterozygous knock-in of EGFR activating mutation (L858R)	HD 101-016
EGFR (T790M/+)	MCF10A	Heterozygous knock-in of EGFR mutation (T790M) conferring drug resistance	HD 101-019
EGFR (L861Q/+)	RKO	Heterozygous knock-in of EGFR activating mutation (L861Q)	HD 106-007
EGFR (T790M/+)	RKO	Heterozygous knock-in of EGFR mutation (T790M) conferring drug resistance	HD 106-005
EGFR (L858R/+)	RKO	Heterozygous knock-in of EGFR activating mutation (L858R)	HD 106-006
Fanconi Anaemia family			
FANCC (-/-/-)	RKO	Knock-out of all three FANCC alleles in triploid parental cells	HD R05-006
FANCG (-/-)	RKO	Homozygous knock-out of FANCG	HD R05-005
GLUT1			
GLUT1 (-/-)	DLD-1	Homozygous knock-out of GLUT1	HD R00-024
GLUT1 (-/-)	RKO	Homozygous knock-out of GLUT1	HD R05-011
HAUSP			
HAUSP (-/-)	HCT116	Homozygous knock-out of HAUSP	HD R02-028
HAUSP (+/-)	HCT116	Heterozygous knock-out of HAUSP	HD R02-029
IDH1			
IDH1 (R132H/+)	HCT116	Heterozygous knock-in of IDH1 dominant-negative (R132H) point mutation	HD 104-013
IDH1 (+ ^{SBP-3xFlag} /+)	HCT116	Heterozygous SBP-3xFlag-tagged endogenous IDH1	HD 115-002
IDH1 (R132H/+)	MCF10A	Heterozygous knock-in of IDH1 point mutation	HD 101-013



Off-The-Shelf Cell Lines

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Genotype	Cell Line	Description	Catalogue ID
Kaiso Kaiso (+ ^{SBP-3xFlag} /Y)	HCT116	Heterozygous SBP-3xFlag-tagged endogenous X-linked Kaiso allele in male parental cells	HD 115-033
K-Ras K-Ras (G12C/+) K-Ras (G13D/-) K-Ras (+/-) K-Ras (G13D/-) K-Ras (+/-) K-Ras (G13D/+) K-Ras (G13D/+); PI3Ka (H1047R/+) K-Ras (G12V/+) K-Ras (G12V/+); PI3Ka (E545K/+) K-Ras (G12V/+); PI3Ka (H1047R/+) K-Ras (G12D/+ ⁿ) K-Ras (G12V/+) K-Ras (G13D/+) K-Ras (G12D/+) K-Ras (G12C/+) K-Ras (G12S/+) K-Ras (G12R/+) K-Ras (G12A/+) K-Ras (+ ^{HaloTag} /+) K-Ras (G12C ^{HaloTag} /+) K-Ras (G12D ^{HaloTag} /+) K-Ras (G12V ^{HaloTag} /+) K-Ras (G13D ^{HaloTag} /+)	Cal-12T DLD-1 DLD-1 HCT116 HCT116 HME HME MCF10A MCF10A MCF10A NCI-H838 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48 SW48	Heterozygous knock-in of K-Ras activating mutation (G12C) Knock-out of wild type K-Ras allele in heterozygous parental cells Knock-out of mutant K-Ras allele in heterozygous parental cells Knock-out of wild type K-Ras allele in heterozygous parental cells Knock-out of mutant K-Ras allele in heterozygous parental cells Heterozygous knock-in of K-Ras activating mutation (G13D) Double heterozygous knock-in of K-Ras and PI3Ka activating mutations Heterozygous knock-in of K-Ras activating mutation (G12V) Double heterozygous knock-in of K-Ras and PI3Ka activating mutations Double heterozygous knock-in of K-Ras and PI3Ka activating mutations Heterozygous knock-in of K-Ras activating mutation (G12D); published data indicates 7n copy number Heterozygous knock-in of K-Ras activating mutation (G12V) Heterozygous knock-in of K-Ras activating mutation (G13D) Heterozygous knock-in of K-Ras activating mutation (G12D) Heterozygous knock-in of K-Ras activating mutation (G12C) Heterozygous knock-in of K-Ras activating mutation (G12S) Heterozygous knock-in of K-Ras activating mutation (G12R) Heterozygous knock-in of K-Ras activating mutation (G12A) Heterozygous HaloTag fusion to wild type K-Ras Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G12C) Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G12D) Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G12V) Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G13D)	HD 113-001 HD 105-011 HD 105-002 HD 104-011 HD 104-008 HD 100-004 HD 200-003 HD 101-004 HD 201-002 HD 201-003 HD 114-002 HD 103-007 HD 103-002 HD 103-011 HD 103-006 HD 103-013 HD 103-010 HD 103-009 HD 103-015 HD 103-018 HD 103-021 HD 103-019 HD 103-020
Ku70 Ku70 (+/-); LIGIV (-/-) Ku70 (+/-); DNA-PKcs (-/-)	HCT116 HCT116	Heterozygous knock-out of Ku70; Homozygous knock-out of LIGIV Heterozygous knock-out of Ku70; Homozygous knock-out of DNA-PKcs;	HD R02-064 HD R02-051
LIGIII LIGIII (+ ^{Floxed} /-)	HCT116	Knock-out of one LIGIII allele and flanking of exon 4 in remaining allele with LoxP sites	HD R02-061
LIGIV LIGIV (-/-) LIGIV (-/-); Ku70 (+/-)	HCT116 HCT116	Homozygous knock-out of LIGIV Homozygous knock-out of LIGIV; heterozygous knock-out of Ku70	HD R02-063 HD R02-064
MEK1 and MEK2 MEK1 (-/-) MEK2 (-/-) MEK1 (-/-) MEK2 (-/-) MEK2 (+/-) MEK1 (-/-) MEK2 (-/-) MEK2 (+/-)	DLD-1 DLD-1 HCT116 HCT116 HCT116 RKO RKO RKO	Homozygous knock-out of MEK1 Homozygous knock-out of MEK2 Homozygous knock-out of MEK1 Homozygous knock-out of MEK2 Heterozygous knock-out of MEK2 Homozygous knock-out of MEK1 Homozygous knock-out of MEK2 Heterozygous knock-out of MEK2	HD R00-017 HD R00-018 HD R02-030 HD R02-031 HD R02-032 HD R05-010 HD R05-007 HD R05-008
microRNA miR-21 (-/-)	RKO	Homozygous knock-out of miR-21	HD R05-013
MKK4 MKK4 (-/-)	Panc 04.03	Homozygous knock-out of MKK4	HD 109-002
MLH1 MLH1 (+/-)	HCT116	Heterozygous knock-in of wild type MLH1 allele in mutant parental cells	HD 104-006
MMSET MMSET (trans/-) MMSET (+/-)	KMS-11 KMS-11	Knock-out of non-translocated MMSET allele in heterozygous parental cells Knock-out of translocated MMSET allele in heterozygous parental cells	HD 108-001 HD 108-002
Mre11 Mre11 (+ ^{CBP-3xFlag} /+)	RKO	Heterozygous CBP-3xFlag-tagged endogenous Mre11	HD 115-020
MTAP MTAP (-/-)	DLD-1	Homozygous knock-out of MTAP	HD R00-021
mTOR mTOR (S2035I/S2035I) mTOR (S2035I/+)	HCT116 HCT116	Homozygous knock-in of mTOR (S2035I) rapamycin resistance mutation Heterozygous knock-in of mTOR (S2035I) rapamycin resistance mutation	HD 104-018 HD 104-014



Off-The-Shelf Cell Lines

Genotype	Cell Line	Description	Catalogue ID
MUS81			
MUS81 (-/-)	NALM6	Homozygous knock-out of MUS81	HD 115-055
N-Ras			
N-Ras (Q61K/+)	A375	Heterozygous knock-in of N-Ras GTPase activating mutation (Q61K)	HD 118-001
N-Ras (Q61K/+)	SW48	Heterozygous knock-in of N-Ras GTPase activating mutation (Q61K)	HD 103-017
N-Ras (Q61R/+)	SW48	Heterozygous knock-in of N-Ras GTPase activating mutation (Q61R)	HD 103-022
p21			
p21 (-/-)	DLD-1	Homozygous knock-out of p21	HD R00-020
p21 (+/-)	HCT116	Heterozygous knock-out of p21	HD R02-036
p21 (-/-)	HCT116	Homozygous knock-out of p21	HD R02-035
p21 (-/-); BAX (-/-)	HCT116	Double homozygous knock-out of p21 and BAX	HD R02-010
p21 (-/-); PUMA (-/-)	HCT116	Double homozygous knock-out of p21 and PUMA	HD R02-041
p53			
p53 (-/;sil)	DLD-1	Heterozygous knock-out of p53 mutant (S241F) allele; second allele silenced	HD 105-004
p53 (+/;sil)	DLD-1	Heterozygous knock-in of wild type p53; second allele silenced	HD 105-005
p53 (S241F/-)	DLD-1	Knock-out of silenced p53 allele	HD 105-014
p53 (+/;sil); ATR (a2101g/a2101g)	DLD-1	Knock-in of wild type p53; homozygous hypomorphic ATR mutation (Seckel)	HD 202-001
p53 (S241F/sil); ATR (a2101g/a2101g)	DLD-1	p53 mutant (S241F) background; homozygous hypomorphic ATR mutation (Seckel)	HD 105-010
p53 (S241F/sil); ATR (a2101g/+)	DLD-1	p53 mutant (S241F) background; heterozygous hypomorphic ATR mutation (Seckel)	HD R00-025
p53 (S241F/sil); CHK1 (S317A/-)	DLD-1	p53 (S241F) mutant background; heterozygous knock-in of phosphorylation site mutant and knock-out of wild type CHK1	HD R00-007
p53 (-/-); CDK2 (-/-)	HCT116	Double homozygous knock-out of p53 and CDK2	HD R02-016
p53 (-/-); CHK1 (+/-)	HCT116	p53 null background; heterozygous knock-out of CHK1	HD R02-078
p53 (+/+); CHK1 (+/-)	HCT116	p53 wild type background; heterozygous knock-out of CHK1	HD R02-077
p53 (-/-); CHK2 (-/-)	HCT116	p53 null background; homozygous knock-out of CHK2	HD R02-018
p53 (+/+); CHK2 (-/-)	HCT116	p53 wild type background; homozygous knock-out of CHK2	HD R02-017
p53 (-/-)	HCT116	Homozygous knock-out of p53	HD 104-001
p53 (+/-)	HCT116	Heterozygous knock-out of wild type p53	HD R02-037
p53 (R248W/+)	HCT116	Heterozygous knock-in of mutant (R248W) p53	HD 104-002
p53 (-/-)	MCF10A	Homozygous knock-out of p53	HD 101-005
p53 (-/-)	RKO	Homozygous knock-out of p53	HD 106-002
p53 (+/-)	RKO	Heterozygous knock-out of wild type p53	HD R05-009
p53 (-/-)	SW48	Homozygous knock-out of p53	HD 103-004
p53 (+/-)	SW48	Heterozygous knock-out of p53	HD R06-001
p53 (R273H/+)	SW48	Heterozygous knock-in of mutant (R273H) p53	HD 103-008
PI3Ka			
PI3Ka (E545K/-)	DLD-1	Knock-out of PI3Ka wild type allele in heterozygous parental cells	HD 105-012
PI3Ka (+/-)	DLD-1	Knock-out of PI3Ka hinge domain mutant allele (E545K) in heterozygous parental cells	HD 105-001
PI3Ka (+/-); Luciferase over-expression	DLD-1	Knock-out of PI3Ka helix domain mutant allele (E545K) in heterozygous parental cells over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 105-015
PI3Ka (H1047R/-)	HCT116	Knock-out of PI3Ka wild type allele in heterozygous parental cells	HD 104-012
PI3Ka (+/-)	HCT116	Knock-out of PI3Ka kinase domain mutant allele (H1047R) in heterozygous parental cells	HD 104-007
PI3Ka (H1047R/+)	HME	Heterozygous knock-in of PI3Ka kinase domain activating mutation	HD 100-002
PI3Ka (H1047R/+); K-Ras (G13D/+)	HME	Double heterozygous knock-in of PI3Ka and K-Ras activating mutations	HD 200-003
PI3Ka (H1047R/+); EGFR (Δ E746-A750/+)	HME	Double heterozygous knock-in of PI3Ka and EGFR activating mutations	HD 200-001
PI3Ka (E545K/+)	HME	Heterozygous knock-in of PI3Ka hinge domain activating mutation	HD 100-003
PI3Ka (H1047R/+)	MCF10A	Heterozygous knock-in of PI3Ka kinase domain activating mutation	HD 101-011
PI3Ka (H1047R/+); K-Ras (G12V/+)	MCF10A	Double heterozygous knock-in of PI3Ka and K-Ras activating mutations	HD 201-003
PI3Ka (H1047R/+); EGFR (Δ E746-A750/+)	MCF10A	Double heterozygous knock-in of PI3Ka and EGFR activating mutations	HD 201-001
PI3Ka (E545K/+)	MCF10A	Heterozygous knock-in of PI3Ka hinge domain activating mutation	HD 101-002
PI3Ka (E545K/+); K-Ras (G12V/+)	MCF10A	Double heterozygous knock-in of PI3Ka and K-Ras activating mutations	HD 201-002
PI3Ka (H1047R/+)	SW48	Heterozygous knock-in of PI3Ka kinase domain activating mutation	HD 103-005
PI3Ka (E545K/+)	SW48	Heterozygous knock-in of PI3Ka hinge domain activating mutation	HD 103-001
PI3Ka (E5452/+)	SW48	Heterozygous knock-in of PI3Ka helix domain activating mutation	HD 103-016
PPARδ			
PPAR δ (-/-)	HCT116	Homozygous knock-out of PPAR δ	HD R02-038
PTEN			
PTEN (-/-)	HCT116	Homozygous knock-out of PTEN	HD 104-004
PTEN (-/-)	MCF10A	Homozygous knock-out of PTEN	HD 101-006
PTEN (-/-)	SW48	Homozygous knock-out of PTEN	HD 103-012



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Genotype	Cell Line	Description	Catalogue ID
PTPN14 PTPN14 (+ ^{CBP-3xFlag} / ₊ ^{CBP-3xFlag})	DLD-1	Homozygous CBP-3xFlag-tagged endogenous PTPN14	HD 115-022
PUMA PUMA (-/-)	DLD-1	Homozygous knock-out of PUMA	HD R00-029
PUMA (Δ p53BS/ Δ p53BS)	DLD-1	Homozygous knock-out of p53 binding site in PUMA promoter	HD R00-042
PUMA (-/-)	HCT116	Homozygous knock-out of PUMA	HD R02-040
PUMA (-/-); p21 (-/-)	HCT116	Double homozygous knock-out of PUMA and p21	HD R02-041
PUMA (Δ p53BS/ Δ p53BS)	HCT116	Homozygous knock-out of p53 binding site in PUMA promoter	HD R02-098
Rac1 Rac1 (Q61L/+)	MCF10A	Heterozygous knock-in of Rac1 mutant (Q61L)	HD 101-014
Rac1 (Q61L/+/+)	SW48	Heterozygous knock-in of Rac1 mutant (Q61L)	HD 103-014
Securin Securin (-/-)	HCT116	Homozygous knock-out of Securin	HD R02-043
SMAC SMAC (-/-)	HCT116	Homozygous knock-out of SMAC	HD R02-045
SMAD4 SMAD4 (-/-)	HCT116	Homozygous knock-out of SMAD4	HD 104-005
STAT3 STAT3 (Y705F/Y705F)	DLD-1	Homozygous knock-in of STAT3 Y705F mutation	HD 115-016
TCF4 TCF4 (Luciferase reporter)	DLD-1	Luciferase reporter expression under the control of the TCF4 promoter	HD R00-022
Trim37 Trim37 (+ ^{CBP-3xFlag} / ₊)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Trim37	HD 115-013
WRN WRN (-/-)	NALM6	Homozygous knock-out of WRN	HD 115-053
XIAP XIAP (-/γ)	DLD-1	Knock-out of X-linked XIAP allele in male parental cells	HD R00-023
XIAP (-/γ)	HCT116	Knock-out of X-linked XIAP allele in male parental cells	HD R02-047
XLF XLF (-/-)	HCT116	Homozygous knock-out of XLF	HD R02-068
XLF (-/-); XLF cDNA over-expression	HCT116	Homozygous knock-out of XLF with over-expression of wild type XLF	HD R02-069
XLF (-/-); XLF (L115A) cDNA over-expression	HCT116	Homozygous knock-out of XLF with over-expression of mutant (L115A) XLF	HD R02-070
XLF (-/-); XLF (L179A) cDNA over-expression	HCT116	Homozygous knock-out of XLF with over-expression of mutant (L179A) XLF	HD R02-071
XLF (+/-)	HCT116	Heterozygous knock-out of XLF	HD R02-067
XRCC4 XRCC4 (-/-)	HCT116	Homozygous knock-out of XRCC4	HD R02-076
XRCC4 (+/-)	HCT116	Heterozygous knock-out of XRCC4	HD R02-075
XRCC4 (+/-)	RPE	Heterozygous knock-out of XRCC4	HD R10-004
Zcchc4 Zcchc4 (+ ^{CBP-3xFlag} / ₊)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Zcchc4	HD 115-014
14-3-3σ 14-3-3σ (-/-)	HCT116	Homozygous knock-out of 14-3-3σ	HD R02-001



Genotype	Cell Line	Description	Catalogue ID
Artemis Artemis (+/-)	RPE	Heterozygous knock-out of Artemis	HD R10-001
Asf1 Asf1 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Asf1	HD 115-003
Bax BAX (+/-)	HCT116	Heterozygous knock-out of BAX	HD R02-009
BCAR1 BCAR1 (Y128F/Y128F) BCAR1 (Y128F/Y128F)	DLD-1 RKO	Homozygous knock-in of mutant (Y128F) BCAR1 Homozygous knock-in of mutant (Y128F) BCAR1	HD 115-031 HD 115-032
Bmi1 Bmi1 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Bmi1	HD 115-005
CCR5 CCR5 (+/-)	RPE	Heterozygous knock-out of CCR5	HD R10-002
CDC4 CDC4 (Δ exon5/-)	HCT116	Heterozygous knock-out of CDC4 exon 5 which encodes F-box domain of the protein	HD R02-014
CHD7 CHD7 (+ ^{CBP-3xFlag} /+)	DLD-1	Heterozygous CBP-3xFlag-tagged endogenous CHD7	HD 115-036
CHD8 CHD8 (+ ^{SBP-3xFlag} /+)	DLD-1	Heterozygous SBP-3xFlag-tagged endogenous CHD8	HD 115-037
CHK1 and CHK2 CHK1 (+/-); p53 (S241F/sil) CHK1 (+/-); p53 (+/sil)	DLD-1 DLD-1	Heterozygous knock-out of CHK1; p53 (S241F) mutant background Heterozygous knock-out of CHK1; knock-in of wild type p53	HD R00-027 HD R00-026
DEC1 DEC1 (+/-)	HACAT	Heterozygous knock-out of DEC1	HD R01-002
DNA-PKcs DNA-PKcs (-/-); DNA-PKcs cDNA over-expression DNA-PKcs (+/-) DNA-PKcs (+/-)	HCT116 NALM6 RPE	Homozygous knock-out of endogenous DNA-PKcs with over-expression of wild type DNA-PKcs Heterozygous knock-out of DNA-PKcs Heterozygous knock-out of DNA-PKcs	HD R02-050 HD R08-001 HD R10-003
DNMT family DNMT1 (+ ^{CBP-3xFlag} /+) DNMT3b (+ ^{CBP-3xFlag} /+)	RKO RKO	Heterozygous CBP-3xFlag-tagged endogenous DNMT1 Heterozygous CBP-3xFlag-tagged endogenous DNMT3b	HD 115-023 HD 115-024
Eed Eed (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Eed	HD 115-007
EZH2 EZH2 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous EZH2	HD 115-008
Fanconi Anaemia family FANCC (+/+/-) FANCC (+/-/-) FANCG (+/-)	RKO RKO RKO	Knock-out of single FANCC allele in triploid parental cells Knock-out of two FANCC alleles in triploid parental cells Heterozygous knock-out of FANCG	HD R05-003 HD R05-004 HD R05-002
HAUSP HAUSP (-/-)	DLD-1	Homozygous knock-out of HAUSP	HD 115-028
HPRT HPRT (-/Y)	HCT116	Knock-out of X-linked HPRT allele in male parental cells	HD R02-052
HSF1 HSF1 (+/+/-)	HCT116	Knock-out of one HSF1 allele in triploid parental cells	HD R12-008
Kaiso Kaiso (-/Y)	HCT116	Homozygous knock-out of X-linked Kaiso allele in male parental cells	HD 115-034
Ku70 Ku70 (+/-)	HCT116	Heterozygous knock-out of Ku70	HD R02-053



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Genotype	Cell Line	Description	Catalogue ID
Ku80 and Ku86			
Ku86 (+ ^{Floxed} /-)	HCT116	Knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites	HD R02-055
Ku86 (+ ^{Floxed} /-); LIGIV (-/-)	HCT116	Knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites; homozygous knock-out of LIGIV	HD R02-057
Ku86 (+ ^{Floxed} /-); LIGIV (+/-)	HCT116	Knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites; heterozygous knock-out of LIGIV	HD R02-056
Ku86 (+ ^{Floxed} /-); RAD54B (+/-/-)	HCT116	Knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites; double knock-out of RAD54B in triploid parental cells	HD R02-059
Ku86 (+ ^{Floxed} /-); RAD54B (+/+/-)	HCT116	Knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites; Single knock-out of RAD54B in triploid parental cells	HD R02-058
Ku86 (+ ^{Floxed} /+)	HCT116	Heterozygous flanking of Ku86 exon 3 with LoxP sites	HD R02-054
Ku86 (+/-)	NALM6	Heterozygous knock-out of Ku86	HD 115-102
K-Ras			
K-Ras (G12A/+); Luciferase over-expression	SW48	Heterozygous knock-in of K-Ras activating mutation (G12A) over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 103-023
K-Ras (G12D/+); Luciferase over-expression	SW48	Heterozygous knock-in of K-Ras activating mutation (G12D) over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 103-024
K-Ras (G12R/+); Luciferase over-expression	SW48	Heterozygous knock-in of K-Ras activating mutation (G12R) over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 103-025
LIGIII			
LIGIII (+ ^{Floxed} /+)	HCT116	Heterozygous flanking of LIGIII exon 4 with LoxP sites	HD R02-060
LIGIV			
LIGIV (-/-); RAD54B (+/-/-)	HCT116	Homozygous knock-out of LIGIV; double knock-out of RAD54B in triploid parental cells	HD R02-066
LIGIV (-/-); RAD54B (+/+/-)	HCT116	Homozygous knock-out of LIGIV; single knock-out of RAD54B in triploid parental cells	HD R02-065
LIGIV (-/-); Ku86 (+ ^{Floxed} /-)	HCT116	Homozygous knock-out of LIGIV; knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites	HD R02-057
LIGIV (+/-); Ku86 (+ ^{Floxed} /-)	HCT116	Heterozygous knock-out of LIGIV; knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites	HD R02-056
LIGIV (-/-)	NALM6	Homozygous knock-out of LIGIV	HD 115-041
LIGIV (-/-); RAD54 (-/-)	NALM6	Double homozygous knock-out of LIGIV and RAD54	HD 115-075
MCTS1			
MCTS1 (-/-)	HCT116	Knock-out of X-linked MCTS1 allele in male parental cells	HD 115-094
MEK1 and MEK2			
MEK1 (-/-)	VACO 432	Homozygous knock-out of MEK1	HD R07-001
MEK2 (-/-)	VACO 432	Homozygous knock-out of MEK2	HD R07-002
MEK2 (+/-)	VACO 432	Heterozygous knock-out of MEK2	HD R07-003
Mre11			
Mre11 (+ ^{CBP-3xFlag} /+)	LoVo	Heterozygous CBP-3xFlag-tagged endogenous Mre11	HD 115-021
Mrgbp			
Mrgbp (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Mrgbp	HD 115-010
MTAP			
MTAP (-/-)	HCT116	Homozygous knock-out of MTAP	HD R02-033
p53			
p53 (R175H ^{Inducible})	DLD-1	Over-expression of GFP-tagged mutant (R175H) p53 induced in the absence of tetracycline	HD R00-010
p53 (wt ^{Inducible})	DLD-1	Over-expression of GFP-tagged wild type p53 induced in the absence of tetracycline	HD R00-012
p53 (S241F/sil); CHK1 (+/-)	DLD-1	p53 (S241F) mutant background; heterozygous knock-out of CHK1	HD R00-027
p53 (+/sil); CHK1 (+/-)	DLD-1	Knock-in of wild type p53; heterozygous knock-out of CHK1	HD R00-026
p53 (R248W/-)	HCT116	Knock-in of mutant (R248W) p53 and knock-out of wild type allele	HD 104-003
p53 (+/-)	SW48	Heterozygous knock-out of p53	HD R06-001
p73			
p73 (R292H ^{Inducible})	DLD-1	Over-expression of HA-tagged mutant (R292H) p73 induced in the absence of tetracycline	HD R00-011
p73 (wt ^{Inducible})	DLD-1	Over-expression of HA-tagged wild type p73 induced in the absence of tetracycline	HD R00-013
Paxillin			
Paxillin (Y88F/Y88F)	DLD-1	Homozygous knock-in of Paxillin Y88F mutation	HD 115-029
Paxillin (Y88F/Y88F)	HCT116	Homozygous knock-in of Paxillin Y88F mutation	HD 115-030



Genotype	Cell Line	Description	Catalogue ID
PPARδ PPAR δ (+/-)	HCT116	Heterozygous knock-out of PPAR δ	HD R02-039
PUMA PUMA (wt ^{inducible})	DLD-1	Over-expression of GFP-tagged PUMA induced in the absence of tetracycline	HD R00-014
RAD54 RAD54B (+/-/-); Ku86 (+ ^{Floxed} /-)	HCT116	Double knock-out of RAD54B in triploid parental cells; knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites	HD R02-059
RAD54B (+/+/-); Ku86 (+ ^{Floxed} /-)	HCT116	Single knock-out of RAD54B in triploid parental cells; knock-out of single Ku86 allele and flanking of exon 3 in remaining allele with LoxP sites	HD R02-058
RAD54 (-/-)	NALM6	Homozygous knock-out of RAD54	HD 115-043
Rcor2 Rcor2 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Rcor2	HD 115-011
S100A4 S100A4 (-/-)	HCT116	Homozygous knock-out of S100A4	HD 115-096
S100A4 (+/-)	HCT116	Heterozygous knock-out of S100A4	HD 115-095
Securin Securin (+/-)	HCT116	Heterozygous knock-out of Securin	HD R02-044
Sirt6 Sirt6 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Sirt6	HD 115-012
STAT3 STAT3 (+ ^{CBP-3xFlag} /+)	DLD-1	Heterozygous CBP-3xFlag-tagged endogenous STAT3	HD 115-015
STAT3 (-/-)	DLD-1	Homozygous knock-out of STAT3	HD 115-017
STAT3 (Y705F/Y705F)	RKO	Homozygous knock-in of STAT3 Y705F mutation	HD 115-019
TGFβRII TGF β RII (wt ^{inducible})	DLD-1	Over-expression of HA and GFP dual tagged TGF β RII induced in the absence of tetracycline	HD R00-016
XLF XLF (-/-); XLF (C123R) cDNA over-expression	HCT116	Homozygous knock-out of XLF with over-expression of mutant (C123R) XLF	HD R02-073
XLF (-/-); XLF (R178X) cDNA over-expression	HCT116	Homozygous knock-out of XLF with over-expression of mutant (R178X) XLF	HD R02-074
XLF (-/-); XLF (R57G) cDNA over-expression	HCT116	Homozygous knock-out of XLF with over-expression of mutant (R57G) XLF	HD R02-072
14-3-3σ 14-3-3 σ (+/-)	HCT116	Heterozygous knock-out of 14-3-3 σ	HD R02-002



Reporter Lines

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Genotype	Cell Line	Description	Catalogue ID
Lines tagged with Flag together with Calmodulin or Streptavidin Binding Protein			
CHD2 (+ ^{CBP-3xFlag} /+)	DLD-1	Heterozygous CBP-3xFlag-tagged endogenous CHD2	HD 115-035
CHD7 (+ ^{CBP-3xFlag} /+)	DLD-1	Heterozygous CBP-3xFlag-tagged endogenous CHD7	HD 115-036
CHD8 (+ ^{SBP-3xFlag} /+)	DLD-1	Heterozygous SBP-3xFlag-tagged endogenous CHD8	HD 115-037
PTPN14 (+ ^{CBP-3xFlag} /+ ^{CBP-3xFlag})	DLD-1	Homozygous CBP-3xFlag-tagged endogenous PTPN14	HD 115-022
STAT3 (+ ^{CBP-3xFlag} /+)	DLD-1	Heterozygous CBP-3xFlag-tagged endogenous STAT3	HD 115-015
Asf1 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Asf1	HD 115-003
Baz2a (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Baz2a	HD 115-004
Bmi1 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Bmi1	HD 115-005
Dot1L (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Dot1L	HD 115-006
E2f1 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous E2f1	HD 115-009
Eed (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Eed	HD 115-007
Ezh2 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Ezh2	HD 115-008
IDH1 (+ ^{SBP-3xFlag} /+)	HCT116	Heterozygous SBP-3xFlag-tagged endogenous IDH1	HD 115-002
Kaiso (+ ^{SBP-3xFlag} /Y)	HCT116	Heterozygous SBP-3xFlag-tagged endogenous X-linked Kaiso allele in male parental cells	HD 115-033
Mrgbp (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Mrgbp	HD 115-010
Rcor2 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Rcor2	HD 115-011
Sirt6 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Sirt6	HD 115-012
Trim37 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Trim37	HD 115-013
UHRF1 (+ ^{SBP-3xFlag} /+)	HCT116	Heterozygous SBP-3xFlag-tagged endogenous UHRF1	HD 115-025
Zcchc4 (+ ^{CBP-3xFlag} /+)	HCT116	Heterozygous CBP-3xFlag-tagged endogenous Zcchc4	HD 115-014
Mre11 (+ ^{CBP-3xFlag} /+)	LoVo	Heterozygous CBP-3xFlag-tagged endogenous Mre11	HD 115-021
B-Raf (+ ^{CBP-3xFlag} /V600E/V600E)	RKO	Heterozygous CBP-3xFlag-tagged endogenous mutant B-Raf	HD 115-027
B-Raf (V600E ^{CBP-3xFlag} /V600E/+)	RKO	Heterozygous CBP-3xFlag-tagged endogenous wild type B-Raf	HD 115-026
DNMT1 (+ ^{CBP-3xFlag} /+)	RKO	Heterozygous CBP-3xFlag-tagged endogenous DNMT1	HD 115-023
DNMT3b (+ ^{CBP-3xFlag} /+)	RKO	Heterozygous CBP-3xFlag-tagged endogenous DNMT3b	HD 115-024
Mre11 (+ ^{CBP-3xFlag} /+)	RKO	Heterozygous CBP-3xFlag-tagged endogenous Mre11	HD 115-020
HaloTag reporter disease models for secondary screening, with particular applications including protein purification, pull-downs and imaging studies			
K-Ras (+ ^{HaloTag} /+)	SW48	Heterozygous HaloTag fusion to wild type K-Ras	HD 103-015
K-Ras (G12C ^{HaloTag} /+)	SW48	Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G12C)	HD 103-018
K-Ras (G12D ^{HaloTag} /+)	SW48	Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G12D)	HD 103-021
K-Ras (G12V ^{HaloTag} /+)	SW48	Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G12V)	HD 103-019
K-Ras (G13D ^{HaloTag} /+)	SW48	Heterozygous HaloTag reporter fusion to K-Ras activating mutation (G13D)	HD 103-020
Over-expression lines			
p53 (R175H ^{Inducible})	DLD-1	Over-expression of GFP-tagged mutant (R175H) p53 induced in the absence of tetracycline	HD R00-010
p53 (wt ^{Inducible})	DLD-1	Over-expression of GFP-tagged wild type p53 induced in the absence of tetracycline	HD R00-012
p73 (R292H ^{Inducible})	DLD-1	Over-expression of HA-tagged mutant (R292H) p73 induced in the absence of tetracycline	HD R00-011
p73 (wt ^{Inducible})	DLD-1	Over-expression of HA-tagged wild type p73 induced in the absence of tetracycline	HD R00-013
PUMA (wt ^{Inducible})	DLD-1	Over-expression of GFP-tagged PUMA induced in the absence of tetracycline	HD R00-014
TCF4 (Luciferase reporter)	DLD-1	Luciferase reporter expression under the control of the TCF4 promoter	HD R00-022
TGFβRII (wt ^{Inducible})	DLD-1	Over-expression of HA and GFP dual tagged TGFβRII induced in the absence of tetracycline	HD R00-016
X-MAN Glo, for tagging existing X-MAN™ cell models with luciferase for in vivo imaging applications			
PI3Ka (+/-); Luciferase over-expression	DLD-1	Knock-out of PI3Ka helix domain mutant allele (E545K) in heterozygous parental cells over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 105-015
K-Ras (G12A/+); Luciferase over-expression	SW48	Heterozygous knock-in of K-Ras activating mutation (G12A) over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 103-023
K-Ras (G12D/+); Luciferase over-expression	SW48	Heterozygous knock-in of K-Ras activating mutation (G12D) over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 103-024
K-Ras (G12R/+); Luciferase over-expression	SW48	Heterozygous knock-in of K-Ras activating mutation (G12R) over-expressing firefly luciferase (Luc2) under the PGK promoter	HD 103-025

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Pending Cell Lines

Pending lines are subject to final characterization, quality control of lifting of publication/exclusivity embargo

Genotype	Cell Line	Description	Catalogue ID
ABL1			
ABL1 (T315L/+)	HCT116	Heterozygous knock-in of ABL mutation (T315L) conferring drug resistance	HD 104-023
ALK			
ALK (F1174L/+)	HCT116	Heterozygous knock-in of ALK activating mutation (F1174L)	HD 104-024
APC			
APC (wt ^{Inducible})	HT-29	Over-expression of wild type APC induced in the presence of zinc	HD R03-001
APOBEC			
APOBEC 3F (+/-)	CEM2n	Heterozygous knock-out of APOBEC3F	HD 117-002
APOBEC 3F (-/-)	CEM2n	Homozygous knock-out of APOBEC3F	HD 117-003
APOBEC 3G (+/-)	CEM2n	Heterozygous knock-out of APOBEC3G	HD 117-004
APOBEC 3G (-/-)	CEM2n	Homozygous knock-out of APOBEC3G	HD 117-005
APOBEC 3D (+/-)	CEM2n	Heterozygous knock-out of APOBEC3D	HD 117-001
APTX			
APTX (-/-)	NALM6	Homozygous knock-out of APTX	HD 115-059
APTX (+/-)	NALM6	Heterozygous knock-out of APTX	HD 115-058
Artemis			
Artemis (-/-)	NALM6	Homozygous knock-out of Artemis	HD 115-045
Artemis (+/-)	NALM6	Heterozygous knock-out of Artemis	HD 115-044
Artemis (-/-); LIGIV (-/-)	NALM6	Double homozygous knock-out of Artemis and LIGIV	HD 115-077
Artemis (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of Artemis; homozygous knock out of LIGIV	HD 115-076
BLM			
BLM (-/-)	NALM6	Homozygous knock-out of BLM	HD 115-039
BLM (+/-)	NALM6	Heterozygous knock-out of BLM	HD 115-038
BLM (-/-); LIGIV (-/-)	NALM6	Double homozygous knock-out of BLM and LIGIV	HD 115-079
BLM (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of BLM; homozygous knock out of LIGIV	HD 115-078
BLM (-/-); p53 (-/-)	NALM6	Double homozygous knock-out of BLM and p53	HD 115-091
BLM (-/-); p53 (+/-)	NALM6	Homozygous knock-out of BLM; heterozygous knock out of p53	HD 115-090
CTIP			
CTIP (+/-)	NALM6	Heterozygous knock-out of CTIP	HD 115-073
DNA-PKcs			
DNA-PKcs (+/-)	BJ	Heterozygous knock-out of DNA-PKcs	HD R09-001
DNA-PKcs (-/-)	NALM6	Homozygous knock-out of DNA-PKcs	HD 115-047
DNA-PKcs (+/-)	NALM6	Heterozygous knock-out of DNA-PKcs	HD 115-046
Fanconi Anaemia Family			
FANCB (-/Y)	NALM6	Knock-out of X-linked FANCB allele in male parental cells	HD 115-065
FANCB (-/Y); MUS81 (-/-)	NALM6	Knock-out of X-linked FANCB allele in male parental cells; homozygous knock-out of MUS81	HD 115-092
HPRT			
HPRT (-/Y)	NALM6	Knock-out of X-linked HPRT allele in male parental cells	HD 115-064
IDH1			
IDH1 (R132C/+)	HCT116	Heterozygous knock-in of IDH1 mutation (R132C) implicated in altered metabolic activity	HD 104-021
IDH2			
IDH2 (R140Q/+)	HCT116	Heterozygous knock-in of IDH1 mutation (R140Q) implicated in altered metabolic activity	HD 104-020
IDH2 (R172K/+)	HCT116	Heterozygous knock-in of IDH1 mutation (R172K) implicated in altered metabolic activity	HD 104-019
INO80			
INO80 (+/-)	NALM6	Heterozygous knock-out of INO80	HD 115-070
JAK2			
JAK2 (V617F/+)	HCT116	Heterozygous knock-in of JAK2 activating mutation (V617F)	HD 104-025
KIT			
KIT (D816V/+)	HCT116	Heterozygous knock-in of Kit activating mutation (D816V)	HD 104-026
K-Ras			
K-Ras (G12V/+)	NCI-H838	Heterozygous knock-in of K-Ras activating mutation (G12V)	HD 114-003
Ku70			
Ku70 (+/-)	NALM6	Heterozygous knock-out of Ku70	HD 115-068
Ku80			
Ku80 (+/-)	NALM6	Heterozygous knock-out of Ku80	HD 115-069



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Genotype	Cell Line	Description	Catalogue ID
LIGI			
LIGI (+/-)	NALM6	Heterozygous knock-out of LIGI	HD 115-066
LIGIII			
LIGIII (+/-)	NALM6	Heterozygous knock-out of LIGIII	HD 115-067
LIGIV			
LIGIV (+/-)	NALM6	Heterozygous knock-out of LIGIV	HD 115-040
LIGIV (-/-); Artemis (-/-)	NALM6	Double homozygous knock-out of LIGIV and Artemis	HD 115-077
LIGIV (-/-); Artemis (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of Artemis	HD 115-076
LIGIV (-/-); BLM (-/-)	NALM6	Double homozygous knock-out of LIGIV and BLM	HD 115-079
LIGIV (-/-); BLM (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of BLM	HD 115-078
LIGIV (-/-); p53 (-/-)	NALM6	Double homozygous knock-out of LIGIV and p53	HD 115-081
LIGIV (-/-); p53 (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of p53	HD 115-080
LIGIV (-/-); POLβ (-/-)	NALM6	Double homozygous knock-out of LIGIV and POLβ	HD 115-083
LIGIV (-/-); POLβ (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of BLM	HD 115-082
LIGIV (-/-); RAD54 (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of RAD54	HD 115-074
LIGIV (-/-); TDP1 (-/-)	NALM6	Double homozygous knock-out of LIGIV and TDP1	HD 115-087
LIGIV (-/-); TDP1 (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of TDP1	HD 115-086
LIGIV (-/-); TOP2β (-/-)	NALM6	Double homozygous knock-out of LIGIV and TOP2β	HD 115-089
LIGIV (-/-); TOP2β (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of TOP2β	HD 115-088
LIGIV (-/-); WRN (-/-)	NALM6	Double homozygous knock-out of LIGIV and WRN	HD 115-085
LIGIV (-/-); WRN (+/-)	NALM6	Homozygous knock-out of LIGIV; heterozygous knock-out of WRN	HD 115-084
MET			
MET (Dexon16/Δexon16)	DLD-1	Homozygous double knockout of exon 16 in MET resulting in a kinase dead receptor	HD 115-093
MKK4			
MKK4 (+/-)	Panc 04.03	Heterozygous knock-out of MKK4	HD 109-001
MUS81			
MUS81 (+/-)	NALM6	Heterozygous knock-out of MUS81	HD 115-054
MUS81 (-/-); FANCB (-/γ)	NALM6	Homozygous knock-out of MUS81; knock-out of X-linked FANCB allele in male parental cells	HD 115-092
Notch1			
Notch1 (L1601P/+)	HCT116	Heterozygous knock-in of Notch activating mutation (L1601P)	HD 104-027
p21			
p21 (-/-); 14-3-3σ (-/-)	HCT116	Double homozygous knock-out of p21 and 14-3-3σ	HD R02-003
p53			
p53 (-/-)	NALM6	Homozygous knock-out of p53	HD 115-049
p53 (+/-)	NALM6	Heterozygous knock-out of p53	HD 115-048
p53 (-/-); BLM (-/-)	NALM6	Double homozygous knock-out of p53 and BLM	HD 115-091
p53 (-/-); LIGIV (-/-)	NALM6	Double homozygous knock-out of p53 and LIGIV	HD 115-081
p53 (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of p53; Homozygous knock-out of LIGIV	HD 115-080
p53 (R248W/+)	RKO	Heterozygous knock-in of mutant (R248W) p53	HD 106-001
POLβ			
POLβ (-/-)	NALM6	Homozygous knock-out of POLβ	HD 115-051
POLβ (+/-)	NALM6	Heterozygous knock-out of POLβ	HD 115-050
POLβ (-/-); LIGIV (-/-)	NALM6	Double homozygous knock-out of POLβ and LIGIV	HD 115-083
POLβ (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of BLM; homozygous knock out of LIGIV	HD 115-082
RAD54			
RAD54 (+/-)	NALM6	Heterozygous knock-out of RAD54	HD 115-042
RAD54 (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of RAD54; homozygous knock out of LIGIV	HD 115-074



Pending Cell Lines

Pending lines are subject to final characterization, quality control of lifting of publication/exclusivity embargo

Genotype	Cell Line	Description	Catalogue ID
RAG1			
RAG1 (-/-)	NALM6	Homozygous knock-out of RAG1	HD 115-063
RAG1 (+/-)	NALM6	Heterozygous knock-out of RAG1	HD 115-062
SMAD4			
SMAD4 (+/-)	HCT116	Heterozygous knock-out of SMAD4	HD R02-046
TDP1			
TDP1 (-/-)	NALM6	Homozygous knock-out of TDP1	HD 115-057
TDP1 (+/-)	NALM6	Heterozygous knock-out of TDP1	HD 115-056
TDP1 (-/-); LIGIV (-/-)	NALM6	Double homozygous knock-out of TDP1 and LIGIV	HD 115-087
TDP1 (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of TDP1; homozygous knock-out of LIGIV	HD 115-086
TOP1			
TOP1 (+/-)	NALM6	Heterozygous knock-out of TOP1	HD 115-072
TOP2α			
TOP2 α (+/-)	NALM6	Heterozygous knock-out of TOP2 α	HD 115-071
TOP2β			
TOP2 β (-/-)	NALM6	Homozygous knock-out of TOP2 β	HD 115-061
TOP2B (+/-)	NALM6	Heterozygous knock-out of TOP2 β	HD 115-060
TOP2B (-/-); LIGIV (-/-)	NALM6	Double homozygous knock-out of TOP2B and LIGIV	HD 115-089
TOP2 β (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of TOP2 β ; homozygous knock-out of LIGIV	HD 115-088
UHRF1			
UHRF1 (+ ^{SBP-3xFlag} /+)	HCT116	Heterozygous SBP-3xFlag-tagged endogenous UHRF1	HD 115-025
WRN			
WRN (+/-)	NALM6	Heterozygous knock-out of WRN	HD 115-052
WRN (-/-); LIGIV (-/-)	NALM6	Double homozygous knock-out of WRN and LIGIV	HD 115-085
WRN (+/-); LIGIV (-/-)	NALM6	Heterozygous knock-out of WRN; Homozygous knock-out of LIGIV	HD 115-084
14-3-3σ			
14-3-3 σ (-/-); p21 (-/-)	HCT116	Double homozygous knock-out of 14-3-3 σ and p21	HD R02-003



In Development Cell Lines

You can order by Email: info@horizondiscovery.com or Tel: +44 (0)1223 655580

Tagged & Reporter Lines

Genotype	Cell line
cMyc reporter with NanoLuc luciferase reporter	HCT116
cyclin D reporter with NanoLuc luciferase reporter	HCT116
gli1 reporter with NanoLuc luciferase reporter	HCT116
Hif1 α reporter with NanoLuc luciferase reporter	HCT116
p21 reporter with NanoLuc luciferase reporter	HCT116

NanoLuc is a registered trademark of Promega Corporation

HIV-Susceptible T-Cell Leukaemia Lines

Genotype	Cell line
Heterozygous knock-out of APOBEC3A	CEM2n A3A
Heterozygous knock-out of APOBEC3B	CEM2n A3B
Heterozygous knock-out of APOBEC3C	CEM2n A3C
Homozygous knock-out of APOBEC3D	CEM2n A3D
Heterozygous knock-out of APOBEC3H	CEM2n A3H
Knock-out of complete locus A3A-A3H	CEM2n A3

Knock-in Mutations

Genotype	Cell line
ALK (F1174L) knock-in	HCT116
EML4-ALK translocation	NCI-H838
KIT (D816V) knock-in	HCT116
JAK2 (V617F) knock-in	SW48
K-Ras (A146T) knock-in	SW48
K-Ras (Q61H) knock-in	SW48
N-Ras (Q61L) knock-in	SW48
Abl1 (T315I) knock-in	SW48
FGFR3 (S249C) knock-in	HCT116
K-Ras (A146T) knock-in	SW48
K-Ras (Q61H) knock-in	SW48

Translating Genomes | Personalizing Medicine



X-MAN™ - Genetically defined, patient-relevant human disease models

- ▶ Library of more than 400 genetically defined, isogenic human cell line pairs
- ▶ Genetically identical except for knock-in or knock-out of mutation of interest

- ▶ Patient-relevant and disease-relevant DNA mutations introduced to endogenous genes
- ▶ Definitive tools for studying cancer vs. normal cell biology and drug responses
- ▶ Produced using a patented, virally-mediated precision genome editing technology - GENESIS™

X-MAN™ - Applications in drug discovery

- ▶ Identify and validate patient-relevant drug targets
- ▶ *In vitro* & *in vivo* applications
- ▶ Identify selective compounds earlier
- ▶ Match drug to responsive patient populations
- ▶ Design shorter, stratified patient-relevant clinical trials
- ▶ Find diagnostic and predictive biomarkers
- ▶ Genomic reference materials for diagnostic controls

What are the features of X-MAN™ cell lines that make them different from other cell lines?

The most important feature of X-MAN™ cell lines is that DNA modifications are always made within the endogenous gene, closely recapitulating the genetic events that lead to a specific disease. The second important feature is that a matched 'isogenic' normal cell line is also provided, containing a wild type version of that gene. This enables the definitive and controlled study of a chosen genetic alteration on a cell's function and the search for novel pharmaceutical agents that selectively target it.

Can X-MAN™ cell lines model diseases other than cancer?

Any genetic variation can be introduced using the GENESIS™ precision genome editing technology, enabling any disease-causing variation to be modelled as an X-MAN™ cell line.



GENESIS™ - Proprietary rAAV-mediated precision genome editing

GENESIS™ targets the gene of interest at its endogenous locus allowing for the first time the accurate modelling of disease-causing mutations (knock-ins or knock-outs) and single nucleotide polymorphisms (SNPs) in human somatic cell lines. GENESIS™ also permits the definitive study of gene function or protein activity via highly specific targeted knockouts of the whole protein or discrete protein domains, respectively.

Why are rAAV-vectors better at gene targeting than other methods?

In somatic cells, the homologous recombination machinery is essentially shut off, however, rAAV-vectors uniquely deliver their targeting constructs in the form of a single-stranded DNA-species which induces a unique single stranded homologous recombination process. rAAV vectors are consistently more efficient than double-stranded plasmid-based vectors. Moreover, rAAV-vectors elicit precise alterations within their target genes, without introducing confounding 'side-modifications' that are inherent with nuclease-based gene targeting techniques.

Will GENESIS™ knock-out or modify a gene in my cell line of interest?

Yes, GENESIS™ has been used to knock-out genes, including tumour suppressor genes p53, PTEN and BRCA2, as well as being able to perform knock-ins of activated mutant oncogenes such as K-Ras, PI3K and EGFR in a range of cell lines (both human and mouse). The tropism of rAAV is wide with respect to tissue type and species of cell. The only major requirement is that the cell line grows continuously in culture conditions. There is no limit to the number of rounds GENESIS™ can be used. Sequential gene targeting enables either both alleles of a target endogenous locus to be modified, or the building of multiple disease genotypes within one target cell.

Gene knock-ins

Targeted insertions or modifications are created within endogenous genes and so are subject to:

1. The correct gene regulation mechanisms
2. Accurately reflect the disease events found in real patients

GENESIS™ can introduce subtle point mutations, SNPs as well as small insertions with high efficiency. Moreover, GENESIS™ does not introduce any confounding 'off-target' genomic events that occur when using other nuclease-based technologies.

Gene knock-outs

Gene knock-outs are at the endogenous locus, and thus are definitive, stable and patient-relevant. No confounding off-target effects are elicited at other genomic loci. It requires a 2-step process:

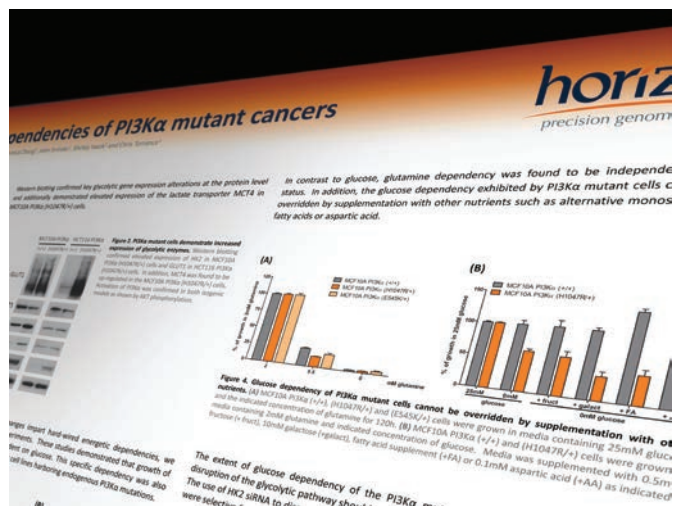
1. Generate a heterozygous knock-out
2. Generate a bi-allelic knock-out by targeting the second allele

This process can therefore generate 3 genotypes (+/+), (+/-) and (-/-) enabling the analysis of haplo-insufficient gene function.

Poster Presentations and Application Notes

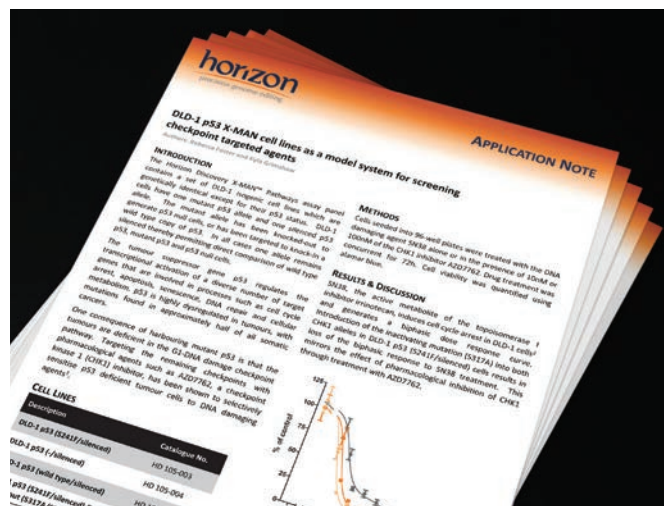
To request **Poster Presentations** or **Application Notes**, please email us at info@horizondiscovery.com and we will email you the requested PDF files.

Poster Presentations



- ▶ Profiling the metabolic dependencies of PI3Kα mutant cancers
- ▶ Isogenic K-Ras mutant cancer cells: A novel platform for drug profiling
- ▶ The use of X-MAN™ isogenic cell lines to define PI3-kinase inhibitor activity profiles
- ▶ Differential impact of gefitinib and PLX4720 on proliferation of MCF10A and isogenic lines as measured with a metastasis expression score
- ▶ Dose-dependent PI3K inhibitor associated decreases of proliferation and “glycolytic index” expression scores in human breast isogenic cell lines
- ▶ Development of a multicellular tumour spheroid model to study the hypoxic tumour microenvironment
- ▶ The use of PI3K isogenic cell lines in conditions that model the tumour microenvironment provides a relevant system in which to test PI3K inhibitor profiles

Application Notes



- ▶ DLD-1 BRCA2 Knock-out Isogenic Paired Cell Lines as a Model for Synthetic Lethality with PARP Inhibitors
- ▶ Compound screening in BRCA2 null X-MAN™ cell lines: A model for synthetic lethality
- ▶ DLD-1 p53 X-MAN cell lines as a model system for screening checkpoint targeted agents
- ▶ Investigating compound selectivity in EGFR mutant X-MAN™ cell lines
- ▶ The Evaluation of drug combinations: Fold of potentiation & combination index
- ▶ MCF10A X-MAN™ cell lines endogenously expressing mutant or wild type PI3K: A model system for screening mTOR-targeted agents
- ▶ The use of PI3Kα X-MAN™ cell lines in conditions that model the tumour micro-environment
- ▶ A multicellular tumour model: Applications for evaluating drugs signalling pathways in a 3D system
- ▶ *In vivo* investigation of cetuximab response in K-Ras isogenic xenograft models

Translating Genomes | Personalizing Medicine

- ▶ Isogenic cell lines including p53, K-Ras, B-Raf, mTOR, IDH1, PI3K α , BRCA, PTEN, Hif1 α , cMyc and EGFR
- ▶ Custom cell lines with your endogenous DNA sequence of interest; SNPs, knock-ins and knock-outs
- ▶ Compound screening, standard and bespoke assay development (*in vitro* and *in vivo*)
- ▶ Genomic standards and reference materials for companion diagnostics



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