

HCT116-Luc Cells | 305787

General information

Description

HCT 116-Luc is a luciferase-expressing derivative of the human colorectal carcinoma cell line HCT 116. The line was generated by transduction with a construct encoding firefly luciferase from *Photinus pyralis* together with a puromycin resistance cassette (*pac*), so reporter expression is constitutive rather than pathway-dependent. Bioluminescent signal is therefore proportional to viable cell number, which makes the model suitable for non-invasive tracking of tumour burden in vivo and for rapid, plate-based quantification of cell viability and proliferation in vitro.

The parental HCT 116 line retains its defining features in this derivative, including microsatellite instability with deficient DNA mismatch repair, wild-type TP53, and a near-diploid karyotype. Its mutational background comprises KRAS p.Gly13Asp, PIK3CA p.His1047Arg, a heterozygous CTNNB1 p.Ser45del that stabilises β -catenin and drives constitutive Wnt signalling, and homozygous frameshift mutations in TGFBR2 and ACVR2A typical of MSI colorectal tumours. Additional variants are present in CDKN2A, EP300, BRCA2 and PPM1D. Stable integration of the reporter allows longitudinal imaging of orthotopic and subcutaneous xenografts in the same animal, reducing cohort sizes and removing the need for terminal endpoints at each time point. Puromycin selection is used to maintain the transgene during routine expansion.

This line is widely applied in preclinical oncology, in efficacy studies of cytotoxic and targeted agents, in metastasis and tumour homing models, and in high-throughput cytotoxicity screening where a luminescent readout offers a wider dynamic range than colorimetric assays. Because luciferase expression is not under inducible control, the signal reports cell number and metabolic state rather than the activity of a specific pathway, so compounds that alter ATP levels or cellular metabolism can affect luminescence independently of cell killing. Orthogonal viability assays are recommended for confirmation, and the mismatch repair deficient background of HCT 116 should be considered when interpreting responses to DNA damaging agents and immunomodulatory treatments.

Organism

Human

Tissue

Colon

Disease

Colon carcinoma

Characteristics

Age

48 years

Gender

Male

Ethnicity

Caucasian

Morphology

Epithelial-like

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Growth properties	Adherent
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Regulatory Data

Citation	HCT116-Luc (Cytion catalog number 305787)
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Biosafety level	1
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NCBI_TaxID	9606
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CellosaurusAccession	CVCL_C8WT
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GMO Status	GMO-S1: This cell line contains a stably integrated firefly luciferase reporter cassette (Luc2, codon-optimized) introduced via replication-incompetent lentiviral transduction. The resulting polyclonal cell population was maintained under puromycin selection (1–5 µg/mL). S1 containment is required. This classification applies only within Germany and may differ elsewhere.
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Biomolecular Data

Antigen expression	Luc2 (firefly, codon-optimized)
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Mutational profile	Mutation: p.Lys437Argfs*5, Homozygous; Mutation: p.Ile2675Aspfs*6, Heterozygous; Mutation: p.Arg24Serfs*20, Heterozygous; Mutation: p.Ser45del, Heterozygous; Mutation: p.Met1470Cysfs*22, Heterozygous; Mutation: p.Asn1700Thrfs*9, Heterozygous; Mutation: p.Gly13Asp, Heterozygous; Mutation: p.His1047Arg, Heterozygous; Mutation: p.Leu450Ter, Heterozygous; Mutation: p.Lys128Serfs*35, Homozygous
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Handling

Culture Medium	McCoy's 5a, w: 3.0 g/L Glucose, w: stable Glutamine, w: 2.0 mM Sodium pyruvate, w: 2.2 g/L NaHCO ₃ (Cytion article number 820200a)
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Supplements	Supplement the medium with 10% FBS
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Dissociation Reagent	Accutase
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Seeding density	1–3*10 ⁴ /cm ²
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Freeze medium

As a cryopreservation medium, we use complete growth medium (including FBS) + 10% DMSO for adequate post-thaw viability, or CM-1 (Cytion catalog number 800100), which includes optimized osmoprotectants and metabolic stabilizers to enhance recovery and reduce cryo-induced stress.

Thawing and Culturing Cells

1. Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
2. Upon receipt, either store the cryovial immediately at temperatures below -150°C to ensure the preservation of cellular integrity, or proceed to step 3 if immediate culturing is required.
3. For immediate culturing, swiftly thaw the vial by immersing it in a 37°C water bath with clean water and an antimicrobial agent, agitating gently for 40-60 seconds until a small ice clump remains.
4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
5. Carefully open the disinfected vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of room-temperature culture medium, mixing gently.
6. Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
7. Gently resuspend the cell pellet in 10 ml of fresh culture medium. For adherent cells, divide the suspension between two T25 culture flasks; for suspension cultures, transfer all the medium into one T25 flask to promote effective cell interaction and growth.
8. Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

Incubation Atmosphere

37°C, 5% CO₂, humidified atmosphere.

Shipping Conditions

Cryopreserved cell lines are shipped on dry ice in validated, insulated packaging with sufficient refrigerant to maintain approximately -78 °C throughout transit. On receipt, inspect the container immediately and transfer vials without delay to appropriate storage.

Storage Conditions

For long-term preservation, place vials in vapor-phase liquid nitrogen at about -150 to -196 °C. Storage at -80 °C is acceptable only as a short interim step before transfer to liquid nitrogen.

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Quality Control & Molecular Analysis

Sterility

Mycoplasma contamination is excluded using both PCR-based assays and luminescence-based mycoplasma detection methods.

To ensure there is no bacterial, fungal, or yeast contamination, cell cultures are subjected to daily visual inspections.