HCT116-Luc

305787

GENERAL INFORMATION

Description

The HCT 116 NF-κB-driven luciferase reporter cell line is a genetically engineered variant of the human colorectal carcinoma cell line HCT 116. This model has been stably transfected with a luciferase reporter construct under the control of an NF-κB response element. As such, it enables quantification of NF-κB transcriptional activity through luminescence, providing a sensitive and high-throughput platform for screening modulators of the NF-κB signaling pathway.
The parental HCT 116 line is characterized by microsatellite instability (MSI), wild-type p53, and a mutant β-catenin gene, features that contribute to its utility in modeling colorectal cancer pathogenesis and responses to various stress and signaling pathways. In the NF-κB reporter variant, activation of NF-κB-commonly via treatment with pro-inflammatory cytokines like TNF-α or other pathway agonists-leads to transcriptional activation of the luciferase gene, enabling real-time monitoring of pathway dynamics. Conversely, the system is also well-suited for evaluating pathway inhibitors, including small molecules or RNA-based agents targeting upstream kinases such as IKK or components of the canonical NF-κB pathway like p65/RelA.
This reporter cell line is particularly valuable for drug discovery and mechanistic studies where modulation of NF-κB plays a role, including cancer, inflammation, and immune regulation. Its robust and quantifiable output makes it compatible with high-throughput screening (HTS) and dose-response assays. However, as with all engineered systems, interpretation of results should consider potential off-target effects of pathway perturbation and the genetic context of HCT 116 cells, especially their deficient DNA mismatch repair system, which may influence broader transcriptional responses.

Tissue	Colon
Disease	Colon carcinoma

Synonyms

- NF-KappaB reporter (Luc)-HCT-116
- NF-KappaB reporter (Luc)-HCT116

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Adherent
GMO status	GMO-S1

GMO status details

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.

Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like
Tumourigenic	Yes, in nude mice (inoculum of 5-10 x 106 cells)
Ploidy status	Aneuploid
MSI status	Instable (MSI-high)

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Karyotype

The karyotype of HCT116 cells is nearly diploid, with 70% of the cells harboring 45 chromosomes, often showing an overrepresentation of chromosomes 8, 10, 16, and 17 on the long arms, along with the absence of the Y-chromosome.

IDENTIFIERS

Citation

HCT116-Luc (Cytion catalog number 305787)

NCBI TaxID	9606
Cellosaurus	CVCL_A9P2

EXPRESSION AND SUSCEPTIBILITY

Antigen expression

Luc2 (firefly, codon-optimized)

Mutational profile

Mutation: ACVR2A, Simple, p.Lys437Argfs*5 (c.1310delA), dbSNP=rs764719749, Homozygous (from parent cell line).Mutation, BRCA2, Simple, p.Ile2675Aspfs*6 (c.8021dupA) (c.8021_8022insA), Heterozygous (from parent cell line).Mutation, CDKN2A, Simple, p.Arg24Serfs*20 (c.68dupG) (c.68_69insG) (p.G23fs), Heterozygous (from parent cell line).Mutation, CTNNB1, Simple, p.Ser45del (c.133_135delTCT), Heterozygous (from parent cell line).Mutation, EP300, Simple, p.Met1470Cysfs*22 (c.4408delA), Heterozygous (from parent cell line).Mutation, EP300, Simple, p.Asn1700Thrfs*9 (c.5099delA), Heterozygous (from parent cell line).Mutation, KRAS, Simple, p.Gly13Asp (c.38G>A), Heterozygous (from parent cell line).Mutation, PIK3CA, Simple, p.His1047Arg (c.3140A>G), Heterozygous (from parent cell line).Mutation, PPM1D, Simple, p.Leu450Ter (c.1349delT) (p.Leu450fs) (c.1344delT), Heterozygous (from parent cell line).Mutation, TGFBR2, Simple, p.Lys128Serfs*35 (c.383delA), Homozygous (from parent cell line).

HANDLING AND CULTURE

Culture medium

MCCoys

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Thawing and culturing

Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
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.
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.
Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
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.
Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
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.
Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

QUALITY CONTROL AND CRYOPRESERVATION

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.

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.

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.

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.

DONOR

Donor age	48 years
Ethnicity	Caucasian

LEGAL AND SAFETY

Safety precautions

When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

Disclaimer

Our cells are provided for in vitro laboratory research purposes exclusively and are not intended for clinical or diagnostic use, nor are they to be administered to humans or used for veterinary purposes. Users must adhere to all applicable guidelines and regulations for the handling and use of these cells in a research setting.

Warranty

At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

Material Transfer Agreement required	Yes