TC-1

305388

GENERAL INFORMATION

Description

TC-1 is a murine lung epithelial cell line transformed with human papillomavirus type 16 (HPV16) E6 and E7 oncogenes, along with an activated H-ras oncogene. The cell line was developed from primary lung epithelial cells of C57BL/6 mice using a dual retroviral transduction strategy. Initially, a retroviral vector derived from Moloney murine leukemia virus (MoMLV), such as pLXSN-16E6E7, was used to deliver the E6 and E7 oncogenes. In this vector, the genes are expressed from the viral 5′ LTR promoter, and a neomycin resistance gene (NeoR) under the control of an internal SV40 promoter enabled selection with G418. Stable expression of E6 and E7 results in inactivation of p53 and Rb tumor suppressor pathways, driving cell immortalization.
Following initial selection, a second MoMLV-based retroviral vector encoding an activated H-ras (G12V) gene was introduced to complete transformation. This vector carried a different selectable marker, typically a hygromycin resistance gene (hph), driven by an internal promoter such as SV40 or PGK. Cells that survived sequential selection with G418 and hygromycin demonstrated stable integration of all three oncogenes, resulting in fully transformed and immortalized TC-1 cells.
In functional studies, TC-1 cells exhibit strong expression of MHC class I molecules, making them highly immunogenic and widely utilized for evaluating experimental vaccines and immunotherapies targeting HPV-associated malignancies. They have been instrumental in preclinical vaccine studies, particularly those aimed at eliciting $CD8^+$ T-cell responses against HPV16 E7. Additionally, sublines with downregulated MHC class I expression have been developed to mimic immune escape mechanisms, providing further insights into the interplay between tumor cells and host immunity. These properties make TC-1 a robust and versatile model for immuno-oncology and HPV vaccine development.

CLASSIFICATION

Organism	Mouse
Sex	Unspecified
Growth properties	Adherent
GMO status	GMO-S1

GMO status details

GMO-S1: This murine lung epithelial cell line (TC-1) contains the HPV16 E6/E7 oncogenes delivered via retroviral vector pLXSN16E6E7 together with HRAS oncogenic sequences, supporting strong transformation. The inserts are stably integrated. This classification applies only within Germany and may differ elsewhere.

Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like
Cell type	Ephitelial
Doubling time	18.2 hours

IDENTIFIERS

Citation

TC-1 (Cytion catalog number 305388)

NCBI TaxID	10090

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Banking information
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IBAN: DE35 6725 0020 0009 2076 86
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Cellosaurus	CVCL_4699

HANDLING AND CULTURE

Culture medium

DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)

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

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase

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

Ethnicity	Unspecified

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.

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

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