Product sheet

TC-1 Cells | 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 (Neo^R) 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.
Organism	Mouse

Characteristics

Gender	Unspecified
Ethnicity	Unspecified
Morphology	Epithelial-like
Cell type	Ephitelial
Growth properties	Adherent

Regulatory Data

Citation	TC-1 (Cytion catalog number 305388)

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Biosafety level	1
NCBI_TaxID	10090
CellosaurusAccession	CVCL_4699
GMO Status	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.

Biomolecular Data

Handling

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)
Supplements	Supplement the medium with 10% FBS
Dissociation Reagent	Accutase
Doubling time	18.2 hours
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% CO_2, humidified atmosphere.
Flask Coating	None
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.

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.