4T1-Luc

305663

GENERAL INFORMATION

Description

4T1-Luc is a genetically engineered variant of the murine 4T1 mammary carcinoma cell line, stably transduced to express a luciferase reporter gene. The parental 4T1 cell line is derived from a spontaneously arising mammary tumor in a mouse and is widely used as a model of stage IV triple-negative breast cancer. It closely mimics human disease in its aggressive growth, poor differentiation, and high metastatic potential, with the ability to spontaneously disseminate from the primary tumor site to distant organs such as lung, liver, bone, and brain. The luciferase-expressing derivative retains these core biological characteristics while enabling non-invasive tracking of tumor progression.
The introduction of the luciferase gene allows for sensitive bioluminescence imaging (BLI) following administration of a luciferin substrate, providing a quantitative and longitudinal readout of tumor burden in live animals. This modification enables real-time monitoring of primary tumor growth, metastatic spread, and therapeutic response without the need for invasive procedures. The luciferase signal correlates with viable cell number, making 4T1-Luciferase particularly useful for in vivo studies of metastasis, tumor kinetics, and drug efficacy in syngeneic immunocompetent mouse models. Stable integration ensures consistent reporter expression across passages, although signal intensity may vary depending on clone selection and experimental conditions.
4T1-Luc maintains the immunological and metastatic properties of the parental line, including resistance to many chemotherapeutic agents and the ability to interact with and modulate the host immune system. This makes it especially valuable for studies of tumor immunology, immune checkpoint therapies, and combination treatment strategies. The addition of a bioluminescent reporter significantly enhances experimental throughput and sensitivity, supporting applications in preclinical drug development, metastatic modeling, and real-time assessment of therapeutic interventions in breast cancer research.

Tissue	Mammary gland
Disease	Malignant neoplasms

CLASSIFICATION

Organism	Mouse
Sex	Female
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 BALB/c mice.

IDENTIFIERS

Citation

4T1-Luc (Cytion catalog number 305663)

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NCBI TaxID	10090
Cellosaurus	CVCL_J239

EXPRESSION AND SUSCEPTIBILITY

Antigen expression

Luc2 (firefly, codon-optimized)

HANDLING AND CULTURE

Culture medium

RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)

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

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase

Subculturing

Remove the old medium from the adherent cells and wash them with PBS that lacks calcium and magnesium. For T25 flasks, use 3-5 ml of PBS, and for T75 flasks, use 5-10 ml. Then, cover the cells completely with Accutase, using 1-2 ml for T25 flasks and 2.5 ml for T75 flasks. Let the cells incubate at room temperature for 8-10 minutes to detach them. After incubation, gently mix the cells with 10 ml of medium to resuspend them, then centrifuge at 300xg for 3 minutes. Discard the supernatant, resuspend the cells in fresh medium, and transfer them into new flasks that already contain fresh medium.

Seeding density	1 to 3 x 10^4 cells/cm^2
Fluid renewal	2 to 3 times per week

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 200 x g for 5 minutes, carefully discard the supernatant containing freezing medium.
Follow the procedure described under Post-Thaw Recovery

QUALITY CONTROL AND CRYOPRESERVATION

Freeze medium	As a cryopreservation medium, we use complete growth medium + 10% DMSO for adequate post-thaw viability.

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

Breed / subspecies	BALB/cfC3H

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