Product sheet

4T1-Luc Cells | 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.
Organism	Mouse
Tissue	Mammary gland
Disease	Malignant neoplasms

Characteristics

Breed/Subspecies	BALB/cfC3H
Gender	Female
Morphology	Epithelial-like
Growth properties	Adherent

Regulatory Data

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Citation	4T1-Luc (Cytion catalog number 305663)
Biosafety level	1
NCBI_TaxID	10090
CellosaurusAccession	CVCL_J239
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.

Biomolecular Data

Antigen expression	Luc2 (firefly, codon-optimized)
Tumorigenic	Yes, in BALB/c mice.
MSI-status	

Handling

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

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

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

Incubation Atmosphere	37°C, 5% CO_2, 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.

Quality Control & Molecular Analysis