

User Manual

OriCell™ 4T1 Mouse Breast Cancer Cell Line with LUC

Catalog No. M2-0202



Introduction

The 4T1 mouse breast cancer cell line is a 6-thioguanine-resistant cell line derived from the parental 410.4 tumor line and established without mutagenesis screening. The tumor growth and metastatic spread of 4T1 cells in BALB/c mice closely mimic those of human breast cancer. Tumors induced by 4T1 cells can serve as both postoperative and non-surgical models, as they spontaneously metastasize in both with similar kinetics.

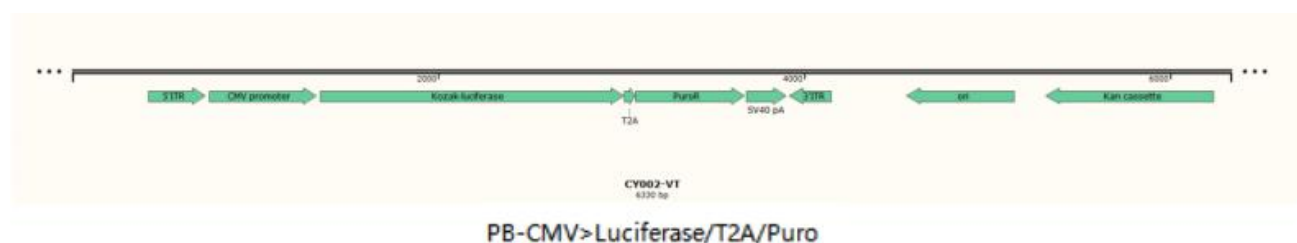
OriCell™ 4T1 Mouse Breast Cancer Cell Line is widely used in cancer research, including studies on breast cancer development and metastasis mechanisms, screening and evaluation of anticancer drugs, investigation of drug resistance, and development and efficacy assessment of cancer vaccines. It provides an important tool and model for breast cancer-related research.

OriCell™ 4T1 Mouse Breast Cancer Cell Line with LUC is generated by transducing the parental 4T1 cell line with a recombinant lentivirus vector carrying the luciferase gene, resulting in stable expression of luciferase. It enables convenient cell tracking and visualization both in vitro and in vivo.

Note: This product is intended for research use only and is not for diagnostic, therapeutic, clinical, household, or any other applications.

When citing our products in academic publications, please use the following format: “OriCell™ [Product Name] + [Catalog Number], from Cyagen Biosciences.”

Expression Vector

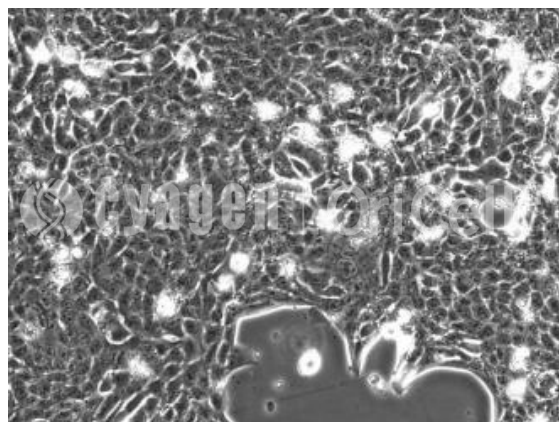


Product Information

Product Name	OriCell™ 4T1 Mouse Breast Cancer Cell Line with LUC
Alternative Name	4T1 with Luciferase
Catalog Number	M2-0202
Amount of Cells	1×10 ⁶ cells/vial
Tissue Origin	Mouse Mammary Gland
Cell Characteristics	Adherent Growth; Epithelial-like
Culture Conditions	95% air; 5% CO ₂ ; 37 °C
Culture Medium	RPMI-1640 + 10% FBS
Doubling Time	48 ~ 72 h
Passage Number	1
Storage at	Liquid Nitrogen (-196 °C)
Precautions	—

Note: This product is manufactured under strict aseptic conditions. You may choose to add antibiotics during subsequent culturing based on your specific needs.

The Morphology of OriCell™ 4T1 Mouse Breast Cancer Cell Line with LUC



Tumorigenicity Data Validation

Fig. The Tumor Growth Curves of 4T1-luc(Mammary) Cancer Syngeneic Model

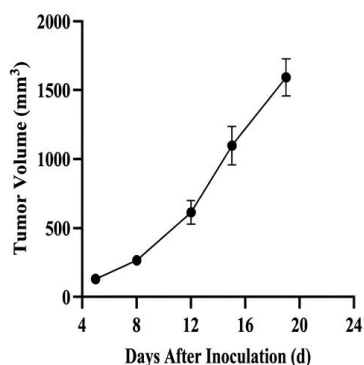


Fig. The Body Weight Change Curves of 4T1-luc(Mammary) Cancer Syngeneic Model

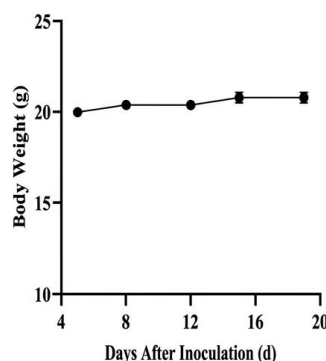


Figure 1. Tumor growth and body weight changes in mice with orthotopic 4T1-luc tumors (n = 6).

4T1 cells (with Luciferase) were injected orthotopically into the mammary fat pad of 7-week-old BALB/c mice, and tumor volumes and fluorescence intensity of mammary fat pad tumors were measured at different time points. Each mouse received 1×10^6 cells, and data are presented as Mean $\pm$ SEM. The results indicate that 4T1-luc cells readily form tumors in BALB/c mice. Tumor volumes are expected to reach 80–150 mm³ by day 5 post-injection and 1,500 mm³ by the experimental endpoint on day 19, with an anticipated drug treatment window of approximately 14 days.

Fig. Images of 4T-1-luc (Liver Metastases) Model in mice

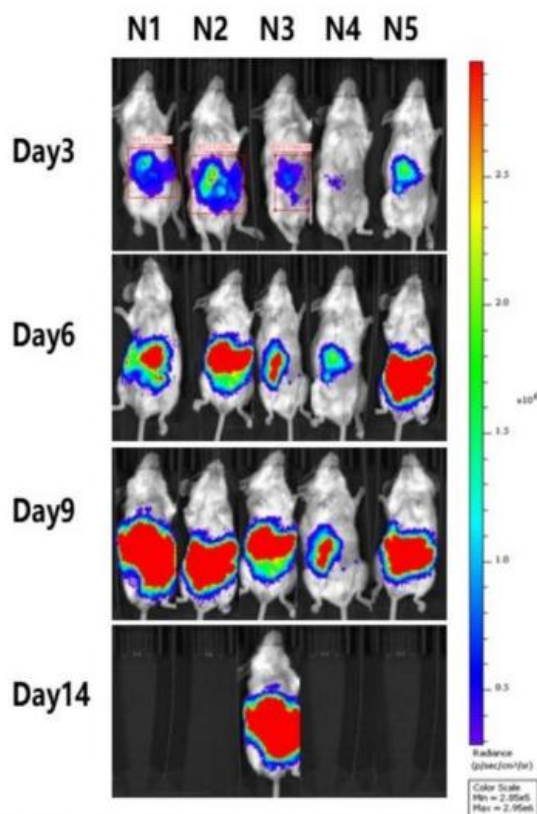


Fig. The Flux Change Curves of 4T-1-luc(Liver Metastases) Cancer Syngeneic Model

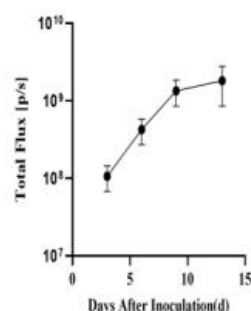


Fig. The Survival of 4T-1-luc(Liver Metastases) Cancer Syngeneic Model

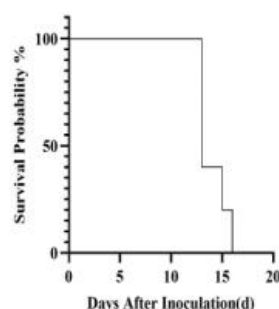


Fig. The Body Weight Change Curves of 4T-1-luc(Liver Metastases) Cancer Syngeneic Model

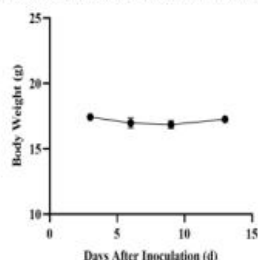


Figure 2. In vivo fluorescence images, total tumor fluorescence intensity growth curve, mouse survival curve, and body weight changes in mice with liver metastasis established by portal vein injection of 4T1-luc breast cancer cells (n = 5).

4T1-luc cells were injected into the portal vein of 7-week-old BALB/c mice, with each mouse receiving 100 μ L of cell suspension containing 5×10^5 cells. Data are presented as Mean $\pm$ SEM. The results indicate that 4T1-luc cells readily form tumors in BALB/c mice, with tumor tissues showing intrahepatic metastasis. For the liver metastasis model established by portal vein injection, it is recommended to randomize mice into treatment groups on day 3 post-inoculation. The median survival time of mice is approximately 13 days, providing an anticipated drug treatment window of approximately 10 days. BALB/c mice are recommended for this model.

Fig. Images of 4T1-luc (Brain Metastases) Model in mice

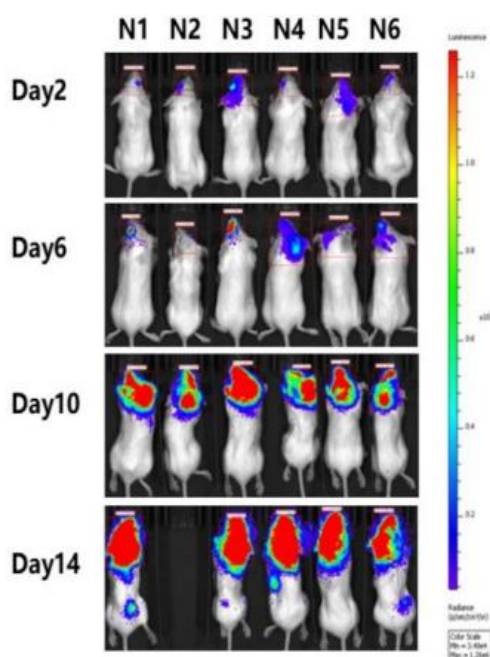


Fig. The Flux Change Curves of 4T1-luc (Brain Metastases) Cancer Model

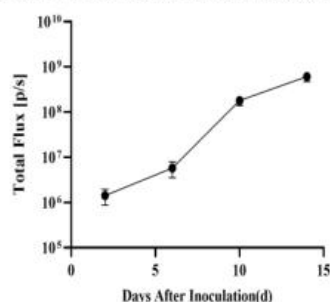


Fig. The Survival of 4T1-luc (Brain Metastases) Cancer Model

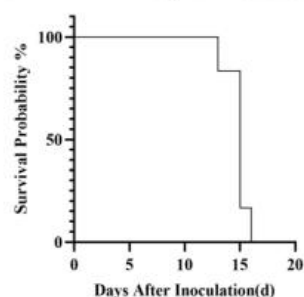


Fig. The Body Weight Changes of 4T1-luc (Brain Metastases) Cancer Model

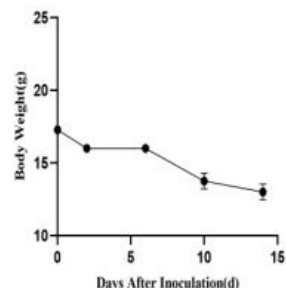


Figure 3. In vivo fluorescence imaging, total tumor fluorescence intensity growth curve, mouse survival curve, and body weight changes in mice with brain metastasis established by internal carotid artery injection (n = 6).

4T1-luc cells were injected into the internal carotid artery of 7-week-old BALB/c mice, with each mouse receiving 20 μ L of cell suspension containing 1×10^5 cells. Data are presented as Mean $\pm$ SEM. The results indicate that 4T1-luc cells readily form tumors in BALB/c mice, with tumor tissues showing intracranial metastasis. For the brain metastasis model established by internal carotid artery injection, it is recommended to randomize mice into treatment groups on day 3 post-inoculation. The median survival time of mice is approximately 15 days, providing an anticipated drug treatment window of approximately 12 days. BALB/c mice are recommended for this model.

QC

- Pass the detection of bacteria, fungi, mycoplasma, and endotoxins.
- Verified by cell recovery viability testing.
- Verified by STR analysis.

Please refer to "COA" for details.

General Handling Principles

1. Maintain strict aseptic technique. Ensure complete sterility throughout all procedures, particularly within the laminar flow hood and incubator.
2. Follow standardized protocols. Adhere strictly to the product manual. Implement rigorous control over experimental variables and include appropriate parallel controls.
3. Use high-quality consumables and reagents. This product requires culture vessels suitable for suspension growth, and the reuse of these vessels is not recommended. The reagents used must be validated for reliability, cell compatibility, and batch-to-batch consistency.

Note: The cryopreservation medium of this product contains DMSO, which may pose potential risks.

Please handle it with care.

Abbreviation	Name	Cat. No.
FBS	Fetal Bovine Serum	See official website
BCS	Bovine Calf Serum	SBCST-01001
Glu	Glutamine	SGLU-10201
SP	Sodium Pyruvate	SCSP-10301
Dex	Dexamethasone	SDEX-10401

NBCS	Newborn Calf Serum	NCSST-01001
HS	Horse Serum	SCHST-01001
NEAA	Non Essential Amino Acid	NEAA-10201
β-mer	β-mercaptoethanol	BMER-10301
P/S	Penicillin- Streptomycin	ATPS-10001
ITS	Insulin / Transferrin / Selenite	ITSS-10201

Thawing and Culturing of Cells

Materials Required

- OriCell™ 4T1 Mouse Breast Cancer Cell Line with LUC (Cat. No.: M2-0202)
- OriCell™ Complete Medium For 4T1 Cell Line (Cat. No.: CMM2-0201)

Steps

Note: If thawing is planned within 24 hours of receipt, store the cells in an ultra-low temperature freezer at -80 °C. For long-term storage (>24 hours) , keep them in liquid nitrogen. Before thawing, transfer the cells from liquid nitrogen to -80 °C and hold them there for 10 minutes. This will allow any residual liquid nitrogen to evaporate and prevent vial explosion.

1. Pre-warm the water bath to 37 °C.
2. Warm the complete medium to 37 °C.
3. Add at least 5 mL of pre-warmed complete medium to a 15 mL centrifuge tube for subsequent use.
4. Remove the cryovial containing cells from the -80 °C freezer, immerse it in the 37 °C water bath, and gently and quickly swirl to thaw the cryopreservation medium.

Note:

(1) Gently swirl the cryovial during thawing to ensure rapid and uniform thawing.

(2) Avoid submerging the cap in water to prevent contamination.

(3) Stop thawing in the water bath when only a single ice crystal (approximately 2 mm in diameter) remains, then continue gently swirling the vial until it is completely thawed.

5. Wipe the outer surface of the cryovial with 75% ethanol.
6. In a biosafety cabinet, open the cryovial and transfer the cell suspension to the prepared centrifuge tube using a Pasteur pipette.
7. Rinse the cryovial once with 1 mL of complete medium to collect residual cells and minimize loss.
8. Centrifuge the cell suspension at $250 \times g$ for 4 minutes.

Note: Please calculate the corresponding rotational speed using the formula: $RCF = 1.118 \times 10^{-5} \times r \times RPM^2$ (where RCF is the relative centrifugal force, r is the rotor radius in cm, and RPM is the rotational speed).

9. Carefully remove the supernatant after centrifugation. Add 2 mL of complete medium, gently resuspend the cell pellet by pipetting up and down to mix thoroughly.
10. Seed the cells into a T25 flask or culture vessel with an equivalent growth surface area. Add sufficient complete medium so that the total volume in a T25 flask is no less than 5 mL.
11. Gently swirl the flask to evenly distribute the cells, then incubate in a CO₂ incubator at 37 °C with 5% CO₂ and saturated humidity.

Note: Do not move or observe the cells within the first 2 hours after seeding, as this may impair cell adhesion, causing poor morphology, clumping, and uneven attachment.

12. On the day after recovery, observe cell status and either replace the medium with fresh complete medium or passage the cells as needed.
13. Replace the complete medium every 3 days until the cells reach approximately 95% confluence, at which point they are ready for passage.

Passaging of Cells

Materials Required

- OriCell™ 0.25% Trypsin-0.04% EDTA Solution (Cat. No.: TEDTA-10001)
- OriCell™ Phosphate-Buffered Saline Solution (1X) (Cat. No.: PBS-10001)
- OriCell™ Complete Medium For 4T1 Cell Line (Cat. No.: CMM2-0201)

Steps

1. Pre-warm the complete medium, PBS and trypsin to 37 °C.
2. Remove the medium in the culture vessel.
3. Gently wash the cells twice with PBS (approximately 3 mL for a T25 flask or 6 mL for a T75 flask).
Ensure thorough washing but avoid excessive force. Then remove the PBS.
4. Add trypsin (approximately 1.5 mL for a T25 flask or 3 mL for a T75 flask), quickly spread it to ensure full coverage of the cell layer.
5. Observe the cells under a microscope. When approximately 70% to 80% of the cells have shrunk and become round, gently tap the outer wall of the culture vessel to detach the cells from the surface.
6. Immediately add complete medium (approximately 3 mL for a T25 flask or 6 mL for a T75 flask), then gently swirl the culture vessel to mix the medium and trypsin, stopping the digestion process.
7. Collect the cell suspension using a pipette, gently pipetting along the bottom of the vessel several times to ensure maximal recovery of the cells.

Note: Pipetting should be performed gently to avoid creating excessive bubbles, as this may cause cell damage or loss.

8. Transfer the cell suspension to a centrifuge tube. Rinse the culture vessel once with PBS (approximately 3 mL for a T25 flask and 6 mL for a T75 flask) to collect residual cells and add the wash to the centrifuge tube.

9. Centrifuge all collected cell suspensions at $250 \times g$ for 4 minutes.
10. Carefully remove the supernatant after centrifugation. Add 2 mL of complete medium and gently resuspend the cell pellet by pipetting up and down to thoroughly mix.
11. Seed the cells into a suitable culture vessel at a density of $(2-3) \times 10^4$ viable cells/cm², or adjust the seeding density based on the actual growth conditions of the cells.

Note: We recommend manual cell counting where possible to obtain an accurate concentration for seeding. If precise counting is not feasible, subculturing at an appropriate ratio is a reliable alternative. Typically, 4T1 cells with Luciferase are passaged at a ratio of 1:3 to 1:4, with cells reaching confluence within 72 hours. Please adjust the subculture ratio based on the actual growth of the cells.

12. Gently agitate the vessel to ensure uniform cell distribution and place it in an incubator at 37 °C, 5% CO₂, and saturated humidity.
13. On the day after passaging, observe the cell condition. If a significant number of floating cells are present, replace the culture medium.
14. Refresh the culture medium every 3 days. When cells reach 95% confluence, passage or cryopreserve the cells.

Cryopreservation of Cells

Materials Required

- OriCell™ NCR Protein-Free Cryopreservation Medium For General Use (Cat. No.: NCPF-10001)
- OriCell™ NCR Cryopreservation Medium For General Use (Cat. No.: NCRC-10001)

Steps

1. Cells should be cryopreserved once they reach an appropriate density suitable for passaging.
2. For cell digestion, please refer to passaging steps 1-9 above.
3. Carefully remove the supernatant after centrifugation and gently resuspend the cells in an appropriate volume of cryopreservation medium.
4. Aliquot the cells into cryovials according to the desired cell number or proportion.

Note: If accurate cell counting is not feasible, we recommend aliquoting cells proportionally for freezing. Prolonged exposure to non-culture conditions will significantly compromise cell viability. Maintain the cells at 4 °C during counting to minimize metabolic activity and preserve cell integrity.

5. When using any of the recommended NCR cryopreservation media above, cryovials can be directly placed individually into a -80 °C freezer.

Note: Avoid opening the freezer door during the first 4 hours of freezing, as temperature fluctuations can adversely affect cell viability.

6. After approximately 8 hours, transfer the cryovials to liquid nitrogen for long-term storage.

Note: Do not store the cryovials at -80 °C for more than 48 hours.

Cyagen Biosciences (Suzhou) Inc. reserves all rights to the technical documents of OriCell™ cell culture products. Without the written permission of Cyagen Biosciences (Suzhou) Inc. any part of this document shall not be adapted or reprinted for other commercial purposes.