4T1-GFP

305625

GENERAL INFORMATION

Description

4T1-GFP is a genetically modified derivative of the murine 4T1 mammary carcinoma cell line that constitutively expresses green fluorescent protein (GFP), enabling real-time visualization and tracking of tumor cells in vitro and in vivo. The parental 4T1 line was originally derived from a spontaneously arising mammary tumor in a BALB/c mouse and is characterized as a highly tumorigenic, triple-negative breast cancer model. When orthotopically injected into the mammary fat pad of syngeneic immunocompetent BALB/c mice, 4T1 cells form aggressive primary tumors that spontaneously metastasize to lung, liver, lymph nodes, and bone, closely recapitulating stage IV human breast cancer progression. Notably, the 4T1 model has been shown to produce osteolytic bone metastases following orthotopic implantation, making it a clinically relevant model for studying breast cancer dissemination and skeletal colonization.

The GFP labeling of 4T1 cells enables sensitive detection of primary tumors, circulating tumor cells, and metastatic foci using fluorescence microscopy, flow cytometry, and in vivo imaging systems. This facilitates quantitative assessment of metastatic burden, intravital imaging of tumor cell dynamics, and tracking of tumor-stromal or tumor-immune cell interactions. In orthotopic and intracardiac models, GFP-expressing 4T1 derivatives allow precise identification of tumor cells within bone marrow, lung parenchyma, and other metastatic sites, overcoming limitations of histological detection alone. Because the parental 4T1 line retains intact immunogenic interactions in syngeneic BALB/c hosts, 4T1-GFP is particularly suitable for studies investigating immune modulation, tumor microenvironment remodeling, and metastatic niche formation under fully immunocompetent conditions.

Molecularly, 4T1 cells exhibit features of aggressive, mesenchymal-like breast carcinoma, including high invasiveness, resistance to anoikis, and robust metastatic capability. Variants and subclones of 4T1 have been reported to display differential metastatic tropism and chemokine expression profiles, such as enhanced CCL4 production in bone-tropic derivatives, highlighting the model's utility in dissecting organ-specific metastasis mechanisms. As a fluorescently traceable counterpart of this established metastatic system, 4T1-GFP provides a powerful platform for quantitative metastasis research, therapeutic efficacy testing, immune-oncology studies, and analysis of tumor cell dissemination and colonization kinetics in vivo.

Genetic modification: Stably modified by replication-incompetent lentiviral transduction to express the ZsGreen1 green fluorescent protein reporter; maintained as a polyclonal population under puromycin selection (1–5 µg/mL). S1/BSL-1 containment.

Tissue	Mammary gland
Disease	Malignant neoplasms
Metastatic site	Lung (primary metastatic site in orthotopic BALB/c model); also liver, lymph nodes, bone

Applications

Metastatic breast cancer research; GFP-based tumor cell tracking; orthotopic mammary fat pad implantation; in vivo imaging (fluorescence); immunotherapy evaluation; cancer immunology; metastasis biology

Synonyms

- 4T1-A
- 4T1.0
- 4T1/WT

CLASSIFICATION

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

Cytion GmbH
Nikola-Tesla-Str. 3
69124 Heidelberg
Tel: +49 (0)6221 405780
info@cytion.com
cytion.com

Registered office Heidelberg
VAT ID: DE283292917
Local court Mannheim - HRB 714394
CEO / Geschäftsführer: Jonathan Steubing

Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB

GMO status details

GMO-S1: This cell line contains a stably integrated ZsGreen1 green fluorescent protein reporter 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
Cell type	Epithelial cells
Doubling time	12.6 hours

IDENTIFIERS

Citation

4T1-GFP (Cytion catalog number 305625)

NCBI TaxID	10090
Cellosaurus	CVCL_0125

EXPRESSION AND SUSCEPTIBILITY

Surface antigens

GFP

Antigen expression

ZsGreen1 (green fluorescent protein)

HANDLING AND CULTURE

Culture medium

RPMI 1640, w: 2.1 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
Split ratio	1 to 3
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

Donor age	Age 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