MDA-MB-231-GFP

305691

GENERAL INFORMATION

Description

MDA-MB-231-GFP is a fluorescently labeled variant of the widely used MDA-MB-231 human breast cancer cell line, engineered to express green fluorescent protein (GFP) via lentiviral transduction. This modification enables real-time visualization and quantification of tumor cell dynamics both in vitro and in vivo, facilitating detailed analysis of tumor-stroma interactions, cellular proliferation, and metastatic behavior. The parental MDA-MB-231 line originates from a pleural effusion of a patient with triple-negative breast cancer (TNBC) and exhibits aggressive, invasive behavior with a mesenchymal phenotype, making it a cornerstone model for studying TNBC pathophysiology and treatment resistance.

In co-culture experiments with human mesenchymal stem/stromal cells (MSCs), MDA-MB-231-GFP cells have demonstrated significantly enhanced proliferation and tumor-promoting behavior. Studies showed that direct contact with MSCs, rather than soluble factors alone, is critical for this effect. Specifically, co-culture with MSCs led to a 39.5% increase in MDA-MB-231-GFP cell proliferation after four days compared to monoculture, and induced expression of CD90 on a subset of breast cancer cells—a marker not expressed under standard conditions. This MSC-induced CD90 expression required direct cell-cell interaction and was partially inhibited by blocking gap junctions or Notch signaling, indicating the involvement of specific intercellular communication pathways.

In vivo, co-injection of MDA-MB-231-GFP cells with MSCs into immunodeficient NOD/scid mice resulted in approximately tenfold increased tumor volume and enhanced metastatic potential compared to injection of cancer cells alone. These tumors exhibited elevated vascularization and higher viability, and retained a minority CD90-positive population, reinforcing the in vitro findings. Together, these studies position MDA-MB-231-GFP as a robust model for investigating tumor-stroma interactions, MSC-induced phenotypic plasticity, and mechanisms of tumor progression in triple-negative breast cancer.

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	Metastatic
Disease	Breast adenocarcinoma
Metastatic site	Pleural effusion

CLASSIFICATION

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

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

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

IDENTIFIERS

Citation

MDA-MB-231-GFP (Cytion catalog number 305691)

NCBI TaxID	9606
Cellosaurus	CVCL_E2QK

EXPRESSION AND SUSCEPTIBILITY

Antigen expression

ZsGreen1 (green fluorescent protein)

Mutational profile

Mutation: p.Gly464Val, Heterozygous; Mutation: p.Gly13Asp, Heterozygous; Mutation: p.Arg280Lys, Homozygous

HANDLING AND CULTURE

Culture medium

DMEM:Ham's F12 (1:1), w: 3.1 g/L Glucose, w: 1.6 mM L-Glutamine, w: 15 mM HEPES, w: 1.0 mM Sodium pyruvate, w: 1.2 g/L NaHCO3 (Cytion 820400a)

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

Supplements

Supplement the medium with 5% FBS

Dissociation reagent	Accutase

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	51 years

Ethnicity	Caucasian

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