

MDA-MB-231-Luc | 305693**General information****Description**

MDA-MB-231-Luciferase is a bioluminescent derivative of the MDA-MB-231 human breast cancer cell line, genetically engineered to express luciferase. This modification enables sensitive, non-invasive detection of tumor burden and metastatic dissemination in live animal models through bioluminescence imaging (BLI). Upon administration of the luciferase substrate, these cells emit light that can be quantified using imaging systems, allowing for dynamic monitoring of tumor growth, metastatic colonization, and therapeutic response over time without the need for repeated invasive procedures.

As a triple-negative breast cancer (TNBC) model, the parental MDA-MB-231 line is ER-, PR-, and HER2-negative, and is characterized by a mesenchymal, invasive phenotype. The luciferase-expressing variant retains these aggressive features and is frequently used in xenograft and metastasis models, particularly to study organotropism such as bone, lung, or brain metastasis. Its high tumorigenic potential in immunocompromised mice combined with luciferase expression makes MDA-MB-231-Luciferase a powerful tool for quantifying tumor dynamics in real time and evaluating anti-cancer drug efficacy, especially in preclinical therapeutic studies targeting metastasis or microenvironmental interactions.

While the luciferase label itself does not alter the inherent biological behavior of the MDA-MB-231 cells, batch-specific validation is recommended to confirm that luciferase integration does not influence proliferation, invasion, or drug response in a given experimental context. This line is especially useful for applications requiring longitudinal tracking, including orthotopic mammary fat pad implantation, tail vein injection for experimental metastasis, or intracardiac injection to model systemic dissemination.

Organism

Human

Tissue

Metastatic

Disease

Breast adenocarcinoma

Metastatic site

Pleural effusion

Characteristics**Age**

51 years

Gender

Female

Ethnicity

Caucasian

Morphology

Epithelial

Growth properties

Adherent

MDA-MB-231-Luc | 305693**Regulatory Data**

Citation	MDA-MB-231-Luc (Cytion catalog number 305693)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_JZ05
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)
Mutational profile	Mutation: p.Gly464Val, Heterozygous; Mutation: p.Gly13Asp, Heterozygous; Mutation: p.Arg280Lys, Homozygous

Handling

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 NaHCO ₃ (Cytion 820400a)
Supplements	Supplement the medium with 10% FBS
Dissociation Reagent	Accutase 5 min. at 37°C
Freeze medium	As a cryopreservation medium, we use complete growth medium + 10% DMSO for adequate post-thaw viability.

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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 $200 \times g$ 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