A549-RFP

305659

GENERAL INFORMATION

Description

A549-RFP is a fluorescently labeled derivative of the human A549 lung adenocarcinoma cell line, engineered to constitutively express red fluorescent protein (RFP) for real-time visualization and tracking. The parental A549 line was established from a lung adenocarcinoma derived from an adult donor and exhibits epithelial morphology with adherent growth characteristics. A549 cells retain features of type II alveolar epithelial cells, including expression of cytokeratins and the capacity for surfactant-associated protein production. The introduction of a stable RFP expression cassette enables continuous fluorescence without significantly altering the intrinsic proliferative and metabolic properties of the parental line, making A549-RFP suitable for longitudinal imaging studies.
Functional characterization of A549 cells within large cancer cell panels has demonstrated that cell size, protein content, and protein synthesis rate are positively correlated with cell volume, and that larger cells tend to proliferate more slowly. In comparative analyses, A549 cells are positioned among relatively smaller, faster-proliferating epithelial cancer cell lines, in contrast to larger, more mesenchymal-like cells that display higher vimentin expression and lower E-cadherin levels. These metabolic and phenotypic distinctions are relevant for experimental interpretation, as protein synthesis rates and metabolic fluxes scale with cell size and influence sensitivity to agents targeting proliferation or mTOR-regulated anabolic pathways. The RFP modification preserves the suitability of A549 cells for such metabolic and pharmacologic investigations while enabling direct visualization.
A549-RFP is widely used in co-culture systems, orthotopic and ectopic xenograft models, and invasion or metastasis assays where fluorescent labeling facilitates discrimination of tumor cells from stromal or host components. The stable red fluorescence supports applications including live-cell imaging, high-content screening, flow cytometry-based quantification, and in vivo optical imaging. As a traceable variant of a well-characterized lung adenocarcinoma model, A549-RFP provides a robust platform for studying tumor cell proliferation, epithelial-mesenchymal transition, drug response, and tumor-microenvironment interactions in both in vitro and in vivo settings.
Genetic modification: Stably modified by replication-incompetent lentiviral transduction to express a red fluorescent protein (RFP) reporter; maintained as a polyclonal population under puromycin selection (1–5 µg/mL). S1/BSL-1 containment.

Tissue	Lung
Disease	Lung adenocarcinoma

Synonyms

- A 549
- A549
- NCI-A549
- A549/ATCC
- A549 ATCC
- A549ATCC
- hA549

CLASSIFICATION

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

GMO status details

GMO-S1: This cell line contains a stably integrated red fluorescent protein (RFP) 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

Doubling time	20-40 hours

IDENTIFIERS

Citation

A549-RFP (Cytion catalog number 305659)

NCBI TaxID	9606
Cellosaurus	CVCL_0023

EXPRESSION AND SUSCEPTIBILITY

Antigen expression

RFP (red fluorescent protein)

Mutational profile

Mutation: p.Gly12Ser, Homozygous; Mutation: p.Gln37Ter, Homozygous

HANDLING AND CULTURE

Culture medium

DMEM:Ham's F12 (1:1), w: 3.1 g/L Glucose, w: 2.5 mM L-Glutamine, w: 15 mM HEPES, w: 0.5 mM Sodium pyruvate, w: 1.2 g/L NaHCO3 (Cytion article number 820400a

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

Supplements

Supplement the medium with 10% 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	58 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