NIH-3T3

400101

GENERAL INFORMATION

Description

NIH-3T3 cells are a fibroblast cell line derived from the tissue of a NIH Swiss mouse embryo. These cells are known for their spindle-shaped morphology and are widely utilized in scientific research due to their ability to grow rapidly and to a high cell density. NIH-3T3 cells are particularly noted for their utility in genetic studies, including DNA transfection experiments, where they are used to introduce foreign DNA into their genomes. This has made them a valuable tool for studying gene function and regulation.
Additionally, NIH-3T3 cells are employed in oncogenic research, specifically in assays for the identification and characterization of cancer-causing genes. They have a remarkable capacity to support the propagation of various types of viruses, including sarcoma and leukemia viruses, making them integral to virology studies.
One of the key features of the NIH-3T3 cell line is its spontaneous immortalization. This characteristic, combined with their genetic stability over continuous passaging, makes NIH-3T3 cells an exemplary model system for exploring cellular processes, signaling pathways, and the effects of various pharmacological treatments in mammalian cells.
Characterized by a heterogeneous cell population, NIH 3T3 mouse cells underscore the intrinsic cellular heterogeneity within fibroblast subtypes, which is critical for deciphering the complex interplay between cellular composition and tissue architecture. These cells exhibit a spindle-like morphology on a chitosan surface, transitioning to an elongated form on OCMCS (oxidized cellulose) surfaces.
The NIH3T3 cell line ontology encompasses various subclones, including 3T3-L1, a model for adipogenesis, and 3T3-J2, employed as a feeder layer in keratinocyte cultures, illustrating the cellular line's broad applicability across different proliferation rates and research disciplines.
NIH-3T3 cells are pivotal in research for their rapid growth, spindle-shaped morphology, and versatility in genetic and oncogenic studies. Their spontaneous immortalization and genetic stability enhance their utility in exploring cellular dynamics and pharmacological effects. The diversity within this cell line, including its response to various substrates and the existence of specialized subclones like 3T3-L1 and 3T3-J2, underscores its broad applicability and critical role in advancing our understanding of cellular behavior and disease mechanisms.

Tissue	Embryonic

Applications

Transfection host

Synonyms

- NIH/3T3
- NIH 3T3
- NIH3T3
- 3T3
- 3T3NIH
- 3T3-Swiss
- Swiss-3T3
- Swiss/3T3
- Swiss 3T3
- Swiss3T3

CLASSIFICATION

Organism	Mouse
Sex	Male
Growth properties	Adherent
Biosafety level	1

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

CHARACTERISTICS

Morphology	Spindle-like morphology, indicative of their fibroblast nature
Cell type	Fibroblast

IDENTIFIERS

Citation

NIH-3T3 (Cytion catalog number 400101)

NCBI TaxID	10090
Cellosaurus	CVCL_0594

EXPRESSION AND SUSCEPTIBILITY

Viruses

MAP-test: Negative.

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

Subculturing

Remove the old medium from the adherent cells and wash them with PBS that lacks calcium and magnesium. For T25 flasks, use 3-5 ml of PBS, and for T75 flasks, use 5-10 ml. Then, cover the cells completely with Accutase, using 1-2 ml for T25 flasks and 2.5 ml for T75 flasks. Let the cells incubate at room temperature for 8-10 minutes to detach them. After incubation, gently mix the cells with 10 ml of medium to resuspend them, then centrifuge at 300xg for 3 minutes. Discard the supernatant, resuspend the cells in fresh medium, and transfer them into new flasks that already contain fresh medium.

Fluid renewal	2 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 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
Gently resuspend the cell pellet in 10 ml of fresh culture medium. For adherent cells, divide the suspension between two T25 culture flasks; for suspension cultures, transfer all the medium into one T25 flask to promote effective cell interaction and growth.
Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

QUALITY CONTROL AND CRYOPRESERVATION

Sterility

Mycoplasma contamination is excluded using both PCR-based assays and luminescence-based mycoplasma detection methods.
To ensure there is no bacterial, fungal, or yeast contamination, cell cultures are subjected to daily visual inspections.

Freeze medium	As a cryopreservation medium, we use complete growth medium (including FBS) + 10% DMSO for adequate post-thaw viability, or CM-1 (Cytion catalog number 800100), which includes optimized osmoprotectants and metabolic stabilizers to enhance recovery and reduce cryo-induced stress.

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

Breed / subspecies	NIH Swiss
Donor age	Embryo

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.

Disclaimer

Our cells are provided for in vitro laboratory research purposes exclusively and are not intended for clinical or diagnostic use, nor are they to be administered to humans or used for veterinary purposes. Users must adhere to all applicable guidelines and regulations for the handling and use of these cells in a research setting.

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