HFF-1

305790

GENERAL INFORMATION

Description

HFF-1 is a human foreskin fibroblast cell line frequently used as a feeder layer for the culture of human embryonic stem cells (hESCs) and induced pluripotent stem cells (iPSCs). Derived from neonatal dermal tissue, HFF-1 cells provide essential extracellular matrix components and secrete key signaling molecules that promote hESC attachment and partially support their pluripotent state. These fibroblasts have been evaluated for their expression of several pluripotency-supporting growth factors, including TGFβ1, activin A, and fibroblast growth factor 2 (FGF-2), although their effectiveness as feeder cells can vary depending on the specific line and culture conditions.
In comparative studies, human foreskin fibroblasts like HFF-1 secrete detectable levels of FGF-2 and activin A, though their secretion levels are generally lower than those observed in mouse embryonic fibroblasts. HFF-1 cells also express BMP-4 mRNA and protein, although secreted levels of BMP-4 dimers are extremely low and often undetectable in conditioned media, likely due to intracellular sequestration or inhibition by gremlin. Importantly, the secretion of growth factors by HFF-1 is modulated by mitotic inactivation (e.g., mitomycin C treatment) and media composition (e.g., KnockOut Serum Replacement vs. fetal bovine serum). The ability of HFF-1 cells to support undifferentiated hESC growth correlates with their secretion of activin A and TGFβ1, although supplementation with exogenous activin A can improve the maintenance of pluripotency markers such as SSEA3 when these cells are used as feeders.
Overall, HFF-1 serves as a useful human-derived feeder cell model for stem cell culture systems aiming to reduce xeno-components. However, their capacity to maintain long-term undifferentiated hESC cultures is generally considered less robust than that of mouse-derived feeder cells unless combined with specific growth factor supplementation. Their human origin, however, makes them particularly attractive for clinical and translational stem cell applications where xeno-free conditions are essential.

Tissue	Foreskin, skin

Synonyms

- HFF1

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Fibroblast
Cell type	Fibroblast of foreskin

IDENTIFIERS

Citation

HFF-1 (Cytion catalog number 305790)

NCBI TaxID	9606
Cellosaurus	CVCL_3285

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HANDLING AND CULTURE

Culture medium

DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)

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

Supplements

Supplement the medium with 15% FBS

Dissociation reagent	Accutase
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 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

Donor age	

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

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