Human Dermal Fibroblast, Adult (HDF-Ad)

300606

GENERAL INFORMATION

Description

Primary Human Dermal Fibroblasts, Adult (NHDF-Ad) are isolated from the dermis of adult skin. They are used in research on skin aging, fibrosis and wound healing and as the dermal component of full-thickness skin equivalents.
Derived from adult skin, NHDF-Ad are a relevant model for age-related processes: in dermal fibroblasts, repeated UVA exposure induces MMP-1, oxidative stress and senescence markers that mirror features of photoaged dermis. They synthesize type I collagen and respond to TGF-β via SMAD2/3 signaling, the central pathway in dermal fibrosis.

Tissue	Skin (dermis)

Applications

UVA-induced photoaging: oxidative stress, MAPK/AP-1 signaling and MMP-1 expression; Cellular senescence after UVA exposure (SA-β-gal, p16, SIRT1/mTOR signaling); Accumulation and degradation of advanced glycation end products in photoaged fibroblasts; Epigenetic regulation of MMP-1 and collagen loss in skin photoaging; Fibrosis research and systemic sclerosis (TGF-β/SMAD signaling, collagen production); Dermal compartment of reconstructed human skin for skin sensitization studies

Synonyms

- NHDF-Ad
- HFIB-D
- Human fibroblasts
- dermis adult
- provitro 1210411

DONOR

Donor age	Adult
Ethnicity	Lot-specific (see CoA)

CLASSIFICATION

Organism	Human
Sex	Lot-specific
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Spindle-shaped (fibroblast-like)
Cell type	Primary fibroblasts
Tumourigenic	No

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HANDLING AND CULTURE

Culture medium

Fibroblast Growth Medium kit (Cytion article number 850066); Fibroblast Growth Medium mix (Cytion article number 850065); Defined Fibroblast Maintenance Medium kit (Cytion article number 850072)

Incubation atmosphere	37°C, 5% CO_2, saturated humidity.

Supplements

Supplement the medium with 10% FBS, 2 ng/mL hr-bFGF, 2 mM stable L-glutamine

Dissociation reagent	Subculture reagents as recommended on the certificate of analysis

Subculturing

Subculture the cells at about 75 % confluence. Denser cultures undergo irreversible contact inhibition and stop proliferating. Use the subculture reagents recommended on the certificate of analysis.

Seeding density	More than 4,000 cells/cm²
Fluid renewal	24 hours after seeding, then every 48 to 72 hours
Post-thaw recovery	Post-thaw viability ≥ 70 % viable cells. More than 80 % confluence within the expected recovery period.

Thawing and culturing

Thaw the cryovial quickly in a 37 °C water bath, swirling gently. Just before the last ice has melted, move the vial to a laminar flow hood and decontaminate its outer surface.
Transfer the cell suspension into a 15 ml centrifuge tube, add 10 ml of Fibroblast Growth Medium and centrifuge at 250 × g for 5 minutes.
Remove the supernatant and resuspend the cell pellet in 10 ml of Fibroblast Growth Medium. Check cell number and viability.
Divide the suspension between two 25 cm² culture flasks (5 ml each). Using two flasks reduces the risk of losing all cells if a passage fails.
Incubate at 37 °C, 5 % CO_2 and saturated humidity, with the screw caps opened by half a turn for gas exchange.
Change the medium after 24 hours to remove unattached cells, then every 48 to 72 hours, using pre-warmed medium only.
Subculture the cells at about 75 % confluence. Denser cultures undergo irreversible contact inhibition and stop proliferating. Use the subculture reagents recommended on the certificate of analysis.
Recommended seeding density: more than 4,000 cells/cm².

QUALITY CONTROL AND CRYOPRESERVATION

Sterility

Mycoplasma contamination is excluded by PCR.
To ensure there is no bacterial, fungal or yeast contamination, cultures are subjected to visual inspection.

Freeze medium	As a cryopreservation medium, we use 90% FBS + 10% DMSO to maintain 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, store vials in liquid nitrogen at about −150 to −196 °C. Storage at −80 °C is acceptable for up to one week only.

Shipping conditions

Cryopreserved primary cells are shipped on dry ice. On receipt, check the cryovial for damage and transfer it without delay to appropriate storage.

EXPRESSION AND SUSCEPTIBILITY

Surface antigens

$CD90^+$, $CD31^-$, $CD45^-$

Protein expression

Positive: CD73/CD90/CD105
Negative: CD14/CD34/CD45/HLA-DR

Viruses

Negative for: HIV-1/2, HBV, HCV, HSV1/2, CMV, EBV, HHV6, Treponema pallidum, Toxoplasma gondii, Chlamydia trachomatis, Ureaplasma urealyticum, Ureoplasma parvum

IDENTIFIERS

Citation

Human Dermal Fibroblast, Adult (HDF-Ad) (Cytion catalog number 300606)

NCBI TaxID	9606

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. Primary cells are of human origin, and no known test procedure can ensure the complete absence of infectious agents. Handle all products as potentially infectious.

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