Human Pulmonary Fibroblasts (HPF, Idiopathic Pulmonary Fibrosis)

SKU: 10HU-240

PRODUCT SHEET

Product Description

Fibroblasts, one of the most abundant cell types, are morphologically and functionally heterogeneous [1]. Human pulmonary fibroblasts (HPF) play an important role in maintaining the structural integrity of connective tissue and in the synthesis of extracellular matrix proteins such as collagens and glycoproteins [2]. Under pathological conditions, such as tissue injury, HPF are stimulated to take part in the process of airway inflammation and airway remodeling which might directly or indirectly lead to angiogenesis, idiopathic fibrosis or even cancer [3]. Idiopathic pulmonary fibrosis (IPF) is a rare, progressive illness of the respiratory system, characterized by replacement of healthy lung tissue with altered extracellular matrix and alveolar architecture is destroyed. IPF is believed to be the result of an aberrant wound healing process involving abnormal fibroblasts activation [4].

Product Details

Catalog Number: 10HU-240
Organism: *Homo Sapiens*, Human
Cell Type: Fibroblasts
Tissue: Human lung tissue
Disease: Idiopathic Pulmonary Fibrosis (IPF)
Package Size: 0.5 x 10^6 cells/vial
Passage Number: P2
Growth Properties: Adherent
Associated Media: Fibroblast Growth Medium (SKU: MD-0011)

Storage Conditions & Shipment

Product Format/Shipped: Cryopreserved
Storage: Liquid Nitrogen

For Research Use Only

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Overview of Human Pulmonary Fibroblasts (HPF, Idiopathic Pulmonary Fibrosis)

iXCells Biotechnologies provides high quality HPF, which are isolated from lung tissue of IPF patients. It provides a robust model for in vitro studies of IPF as well as other fibroblasts related diseases. HPF from iXCells Biotechnologies are cryopreserved at P2, with >0.5 million cells in each vial. HPF express Fibronectin and Vimentin. They are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast, and fungi and can further expand for 10 population doublings in Fibroblast Growth Medium (Cat# MD-0011) under the condition suggested by iXCells Biotechnologies.

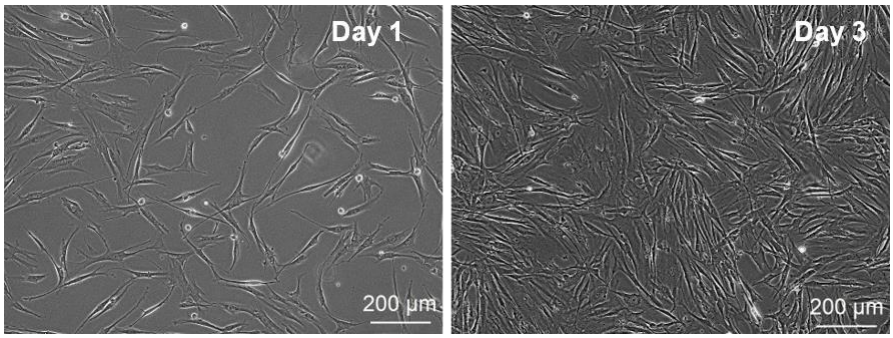

Figure 1. Human Pulmonary Fibroblasts (HPF, Idiopathic Pulmonary Fibrosis). The cells were recovered, and seeded at 10,000 cells/cm2 following iXCells' protocol. Phase contrast images were taken at the indicated time post recovery.

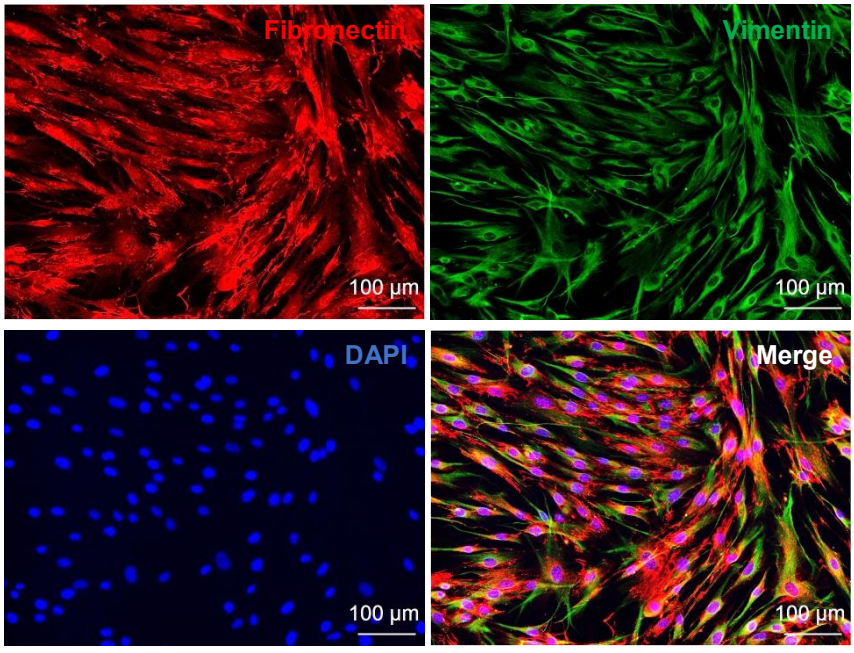

Figure 2. Immunofluorescence staining of Human Pulmonary Fibroblasts (HPF, Idiopathic Pulmonary Fibrosis) with antibodies against Fibronectin (Red) and Vimentin (Green). Nuclei were counterstained by DAPI (Blue).

NOTE: IXCELLS CELLS ARE CULTURED IN 37°C, 5% CO_2 INCUBATOR. CELLS ARE ONLY WARRANTED IF IXCELLS RECOMMENDED MEDIA AND REAGENTS ARE USED AND IF THE PROVIDED PROTOCOLS ARE FOLLOWED.

Cell Culture Reagents

1. Complete culture medium: Fibroblast Growth Medium (SKU: MD-0011), iXCells.
2. Trypsin: 0.05% Trypsin, Cytiva, Cat# SH30236.02.
3. DPBS: DPBS without Calcium, Magnesium, Cytiva, Cat# SH30028.02.

Cell Thawing – Frozen Cells

1. Upon receipt of the frozen cells, it is recommended to thaw the cells and initiate the culture immediately in order to retain the highest cell viability.
2. To thaw the cells, put the vial in 37°C water bath with gentle agitation for 1-2 minutes. Keep the cap out of water to minimize the risk of contamination.
3. Pipette the cells into a 15 mL conical tube with 5 mL fresh Complete Culture Medium.
   ***Note**: please prepare the Complete culture medium following the manufacturer's instruction.*
4. Centrifuge at 1,000 rpm (~220 *g*) for 5 minutes under room temperature.
5. Remove the supernatant and resuspend the cells in fresh complete culture medium.
6. Seed the cells in desired culture vessel at 5,000-10,000 cells/cm^2. Change the medium every other day until cells reach 80-90% confluence.

Safety Precaution: It is highly recommended that protective gloves and clothing should be used when handling frozen vials.

Subculture Procedure

1. When cells reach ~80-90% confluence, remove the medium, and wash once with sterile DPBS (e.g. 5 mL for one T75 flask).
2. Add 3 mL of 0.05% Trypsin-EDTA to the flask and incubate for 5 minutes at 37°C. Neutralize the enzyme by adding 2-3 volumes of cell culture medium.
3. Centrifuge 1,000 rpm (~220 *g*) for 5 minutes and resuspend the cells in desired volume of medium.
4. Seed the cells in the new culture vessels at 5,000-10,000 cells/cm^2. Change the medium every other day until cells reach 80-90% confluence.

***Note:** Penicillin-Streptomycin, Antibiotics and antimycotics, or other antibiotics are optional in the culture media. iXCells in house tests were performed under antibiotics-free condition for ≥3 days by following the recommended protocol, and no bacterial or fungi contamination were observed during the culture period.*

References

[1] Yang P, Luo Q, Wang X, Fang Q, Fu Z, Li J, Lai Y, Chen X, Xu X, Peng X, Hu K, Nie X, Liu S, Zhang J, Li J, Shen C, Liu J, Chen J, Zhong N, Su J. Comprehensive Analysis of Fibroblast Activation Protein Expression in Interstitial Lu Diseases. Am J Respir Crit Care Med. 2023 Jan 15;207(2):160-172.

[2] Hu X, Xu Q, Wan H, Hu Y, Xing S, Yang H, Gao Y, He Z. PI3K-Akt-mTOR/PFKFB3 pathway mediated lung fibrol aerobic glycolysis and collagen synthesis in lipopolysaccharide-induced pulmonary fibrosis. Lab Invest. 2020 Jun;100(6):801-811. doi: 10.1038/s41374-020-0404-9. Epub 2020 Feb 12.

[3] Cruz-Bermúdez A, Laza-Briviesca R, Vicente-Blanco RJ, García-Grande A, Coronado MJ, Laine-Menéndez S, A C, Sanchez JC, Franco F, Calvo V, Romero A, Martin-Acosta P, Salas C, Garcia JM, Provencio M. Cancer-associatec fibroblasts modify lung cancer metabolism involving ROS and TGF-β signaling. Free Radic Biol Med. 2019 Jan;13 173. doi: 10.1016/j.freeradbiomed.2018.10.450. Epub 2018 Nov 1.

[4] Richeldi L, Collard HR, Jones MG. Idiopathic pulmonary fibrosis. Lancet. 2017 May 13;389(10082):1941-1952. doi: 10.1016/S0140-6736(17)30866-8. Epub 2017 Mar 30.

Disclaimers

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