

Human Podocytes

SKU: 10HU-250

PRODUCT SHEET

PRODUCT DESCRIPTION

Glomerular podocytes in kidney are highly specialized visceral epithelial cells with a complex cytoarchitecture. These cells feature finger-like projections called “foot process” that interlock with each other, creating tiny gaps known as filtration slits that play a crucial role in filtering blood within the glomerulus ^[1,2]. Podocytes are involved in a variety of glomerular functions, including glomerular basement membrane turnover, maintenance of filtration barrier, support of the capillary tuft, regulation of glomerular filtration and immunological functions. Injury to podocytes may lead to proteinuria, a hallmark of most glomerular diseases and chronic kidney disease. Disruptions of podocyte architecture resulting in the retraction of foot processes and proteinuria are common features in the progression of acquired glomerular disease ^[3,4].

Product Details

Catalog Number: 10HU-250

Organism: *Homo Sapiens*, Human

Cell Type: Epithelial Cell

Tissue: Human Kidney

Disease: Normal

Package Size: 0.5 x 10⁶ cells/vial

Passage Number: P2

Growth Properties: Adherent

Associated Media: Podocyte Culture Medium (MD-0120)

Storage Conditions & Shipment

Product Format/Shipped: Cryopreserved

Storage: Liquid Nitrogen

For Research Use Only

iXCells Biotechnologies USA, Inc.
United States

www.ixcellsbiotech.com

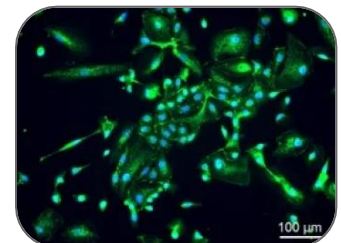
Customer Support

E. supports@ixcellsbiotech.com

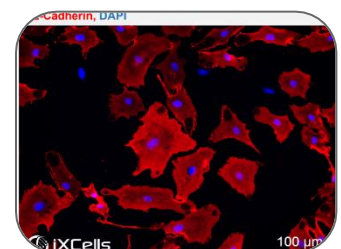
E. orders@ixcellsbiotech.com

P. +1 (858) 412 5988

RELATED PRODUCTS



Human Renal Proximal Tubular Epithelial Cells (HRPTEpC)
SKU: 10HU-112



Human Glomerular Microvascular Endothelial Cells (HGMEC)
SKU: 10HU-061

Overview of Human Podocytes

iXCells Biotechnologies offers high quality primary Human Podocytes isolated from human kidney obtained by following IRB protocol and cryopreserved at P2, with ≥ 0.5 million viable cells in each vial. These podocytes have been characterized by the proliferation, and the expression of cell type specific markers, including CD2AP, Nephtrin, NPHS2, Podocin, Synaptopodin (Figure 1, 2). Human Podocytes are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast, and fungi. These cells can be maintained in Podocyte Culture Medium (Cat# MD-0120) and expanded for 2~3 passages under conditions suggested by iXCells Biotechnologies. Further expansion may decrease podocyte particular traits such as foot processes and expression of slit diaphragm proteins.

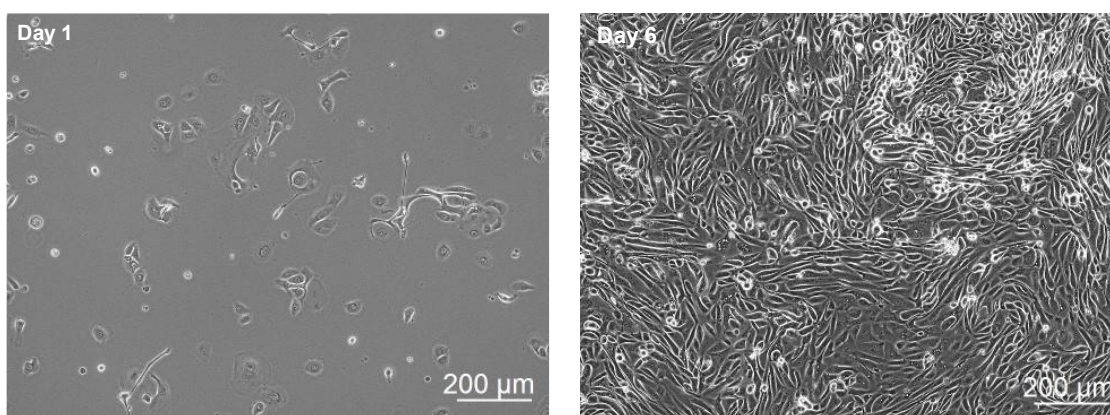


Figure 1. Human Podocytes. The cells were recovered, and seeded at 10,000 cells/cm² following iXCells' protocol. Phase contrast images were taken at the indicated time post recovery.

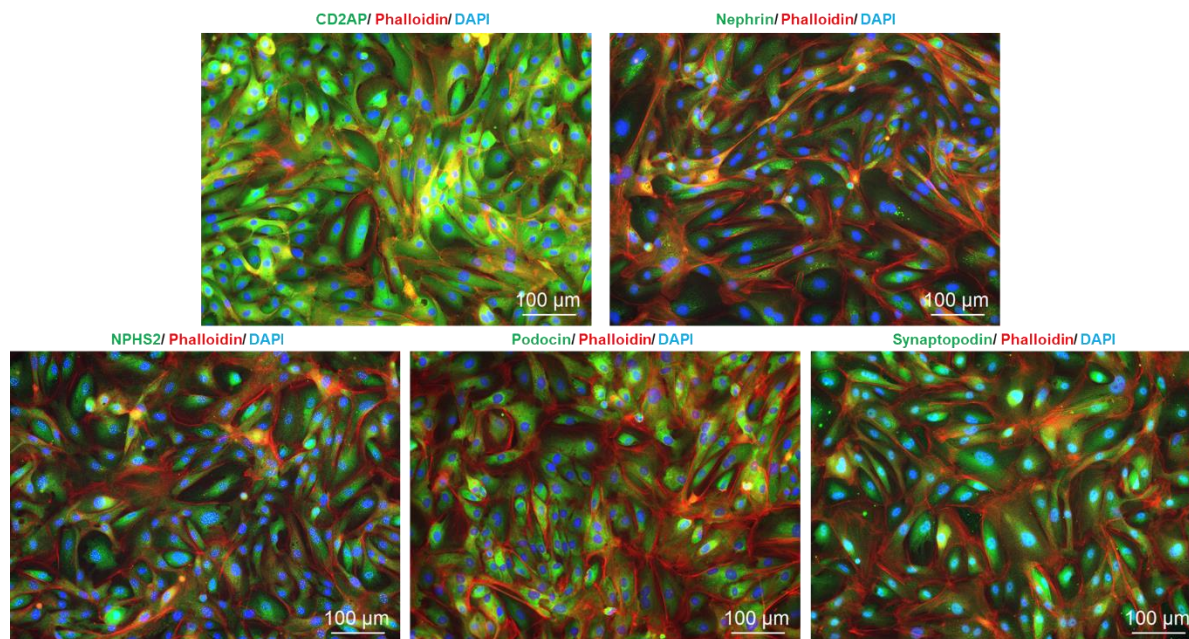


Figure 2. Immunofluorescence staining of Human Podocytes with antibodies against CD2AP, Nephtrin, NPHS2, Podocin, Synaptopodin (Green), and Phalloidin (Red), separately. Nuclei were counterstained by DAPI (Blue).

QuickStart Guide – Protocols

NOTE: IXCELLS CELLS MUST BE CULTURED IN A 37°C, 5% CO₂ INCUBATOR. CELLS ARE ONLY WARRANTED IF IXCELLS MEDIA AND REAGENTS ARE USED AND THE RECOMMENDED PROTOCOLS ARE FOLLOWED.

Coating Protocol using Collagen I

1. Dilute Collagen I (Corning, Cat#354236) with distilled water to 100 µg/mL.
2. Add sufficient diluted collagen I to the desired culture vessel, e.g. 1 mL/well in 6-well culture plate, and please adjust the coating solution proportionally based on the culture vessel surface area.
3. Incubate the culture vessel for 1 hour at 37°C.
4. Remove remaining solution and rinse wells thoroughly with DPBS 3 times.
5. Aspirate the DPBS and use the plate immediately, or air dry the plates and store the coated plate at 2-8 °C.

Note: 1) Coating the culture vessels is required.

2) The Collagen I from other vendors should also work well. Please perform the test before the large scale of experiment.

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 Podocyte Culture Medium (MD-0120).
4. Centrifuge at 350 g for 5 minutes under room temperature.
6. Remove the supernatant carefully without disturbing the pellet and resuspend the cells in fresh Podocyte Culture Medium.

Note: Cell counting post suspension is recommended to determine the cell viability and viable cell number for the following test.

7. Seed the cells in the desired Collagen I precoated culture vessel at 5,000-10,000 cells/cm². 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. Human Podocytes can be sub-cultured in Podocyte Culture Medium (MD-0120).
2. When cells reach ~80-90% confluence, remove the medium, and wash once with sterile DPBS (e.g. 5 mL for one T75 flask).
3. Add 3 mL of 0.25% 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.
4. Centrifuge 350 g for 5 minutes and resuspend the cells in desired volume of medium.
5. Seed the cells in the new Collagen I coated culture vessels at 50,000-10,000 cells/cm².
Change the medium every other day until cells reach 80-90% confluence.

Note: Penicillin-Streptomycin, Antibiotics and antimycotics, or other antibiotics can be optional in the culture media. iXCells in house test was 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] Pavenstadt H., Kriz W., Kretzler M. Cell biology of the glomerular podocyte. *Physiol Rev.* 2003;83(1):253–307.
- [2] Romagnani P., Remuzzi G., Glassock R. Chronic kidney disease. *Nat Rev Dis Primers.* 2017;3:17088.
- [3] Patrakka J., Tryggvason K. New insights into the role of podocytes in proteinuria. *Nat Rev Nephrol.* 2009; 5(8):463–468.
- [4] Levey A.S., Coresh J. Chronic kidney disease. *Lancet.* 2012;379(9811):165–180.

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Contact Information & Customer Support

iXCells Biotechnologies USA, Inc.

United States

www.ixcellsbiotech.com

Technical Support. supports@ixcellsbiotech.com

Product Sales. orders@ixcellsbiotech.com or contact your local distributor

US Phone. +1 (858) 412 5988