www.ixcellsbiotech.com
7270 Trade Street, Suite 102, San Diego, CA 92121
Tel: (858)412-5988 Fax: (858)368-8716
Technical Supports: supports@ixcellsbiotech.com
Orders: orders@ixcellsbiotech.com

Product Information

Human Umbilical Mesenchymal Stem Cells (HUMSC)

Catalog Number	10HU-174	Cell Number	0.5 million cells/vial
Species	*Homo sapiens*	Storage Temperature	Liquid Nitrogen

Description

Mesenchymal stem cells (MSC) are a well-characterized population of adult stem cells. MSC have the potential to develop into mature cells that produce fat, cartilage, bone, tendons, and muscle. These properties, in combination with their developmental plasticity, have generated tremendous interest because of the potential use of MSC in regenerative medicine. MSC isolated from the Wharton's jelly of the umbilical cord were induced to transform into neurons and glia in vitro by using neuron-conditioned medium, sonic hedgehog, and FGF-8 [1, 2]. MSC can also differentiate into cells from the adipogenic and osteogenic lineage. Additionally, they have the potential to differentiate into cardiomyocytes by culturing them in cardiomyocyte-conditioned medium [3]. MSC express the matrix receptors CD44 and CD105 and mesenchymal stem cell markers SH2 and SH3, but not the hematopoietic lineage marker CD34.

Human Umbilical Mesenchymal Stem Cells (HUMSC) from **iXCells Biotechnologies** are isolated from Wharton's jelly of the umbilical cord. HUMSC are cryopreserved at passage one and delivered frozen. Each vial contains 0.5 million cells in 1 ml volume. HUMSC are characterized by immunofluorescence with antibodies specific to CD73, CD90 and CD105. HUMSC are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast and fungi. HUMSC can expand for no more than 3 passages under the conditions recommended by iXCells Biotechnologies using Mesenchymal Stem Cell Medium (Cat# MD-0037).

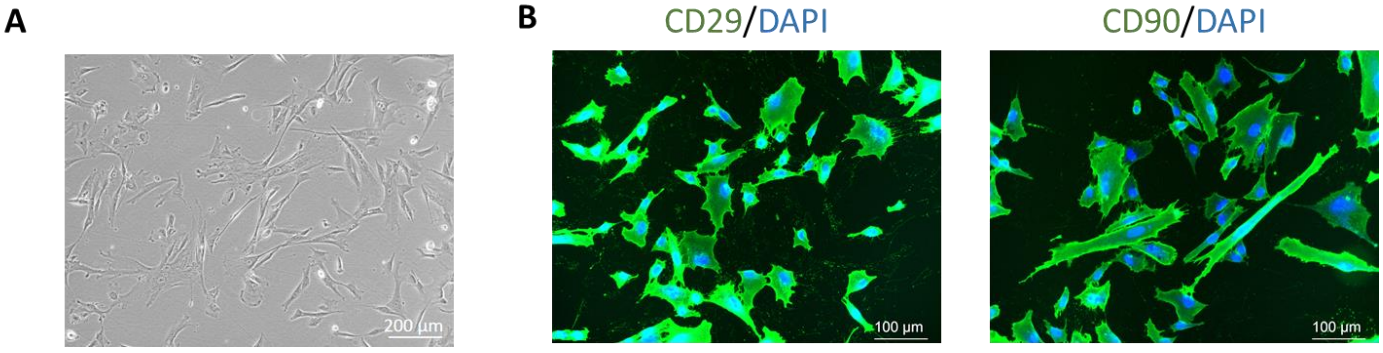

Figure 1. Human Umbilical Mesenchymal Stem Cells (HUMSC). (**A**) Phase contrast image of HUMSC. (**B**) Immunofluorescence staining with antibodies against CD29 and CD90.

Product Details

Tissue	Human Umbilical Cord
Package Size	0.5 million cells/vial
Passage Number	P1
Shipped	Cryopreserved
Storage	Liquid nitrogen
Growth Properties	Adherent
Media	Mesenchymal Stem Cell Medium (Cat # MD-0037) Mesenchymal Stem Cell Chemically Defined Xeno-Free Medium (Cat # MD-0085) Adipocyte Differentiation Medium (Cat # MD-0005) Osteogenic Differentiation Medium (Cat # MD-0006)

Protocols

Standard Culture Procedure

1. Upon receipt of the frozen HUMSC, 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 minute. 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 **Mesenchymal Stem Cell Medium** (Cat # MD-0037).
4. Centrifuge at 1,000 rpm (~220 g) for 5 minutes under room temperature.
5. Remove the supernatant and re-suspend the cells in fresh Mesenchymal Stem Cell Medium (Cat # MD-0037).
6. Culture the cell in one 100 mm tissue culture dish or one T75 flask. Change medium every 3~4 days.
7. When cells reach >85% confluence, freeze them or subculture cells as following
8. Aspirate the culture medium, and wash once with sterile PBS (5 mL/T75 flask).
9. Add ~2 mL of 0.25% Trypsin-EDTA to the flask and incubate for ~3 minutes at 37°C. Neutralize the enzyme by adding 2-3 volumes of cell culture medium.
10. Centrifuge 1,000 rpm (~220 g) for 5min and re-suspend the cells in desired volume of medium.
11. Seed new culture vessels at 5×10^3 cells/cm^2.

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

Adipocytes Differentiation Protocol

1. Culture HUMSC in **Mesenchymal Stem Cell Medium** (Cat # MD-0037) until cell reach > 95% confluence.
2. Aspirate the medium, replace with new Mesenchymal Stem Cell Medium, and let cells grow for 2~3 more days.

3. Aspirate the medium, apply **Adipocyte Differentiation Medium** (Cat # MD-0005) to the cells. Change adipocytes differentiation medium every 3~4 days for up to 2 weeks. The accumulation of lipid droplets in cytoplasm will appear after 1 week.

Osteogenic Differentiation Protocol

1. Grow HMSC in **Mesenchymal Stem Cell Medium** (Cat # MD-0037) to ~80% confluency.
2. Carefully aspirate growth medium, apply 1.5 ml **Osteogenic Differentiation Medium** per well (Cat# MD-0006) to the cells.
3. Change fresh Osteogenic Differentiation Medium every 3 days. Be careful not to disturb the cell monolayer.
4. Culture the cells for more than 21 days and osteoblasts can be detected by Alizarin Red S staining (stain the extracellular calcium deposit).

References

[1] Mitchell, K. E. et al. (2003) Matrix cells from Wharton's jelly form neurons and glia. Stem Cells 21:50-60.

[2] Fu, Y. S. et al. (2006) Conversion of human umbilical cord mesenchymal stem cells in Wharton's jelly to dopaminergic neurons in vitro: potential therapeutic application for Parkinsonium. Stem cells 24:115-124.

[3] Wang, H. S., et al., (2004) Mesenchymal stem cells in the Wharton's jelly of the human umbilical cord. Stem cells 22:1330-1337.

Disclaimers