Product sheet

Human Mesenchymal Stem Cells - Umbilical Cord - Artery | 300648

General information

Description	Human Mesenchymal Stem Cells (hMSCs) derived from the umbilical cord artery are a distinct and promising subtype of mesenchymal stem cells, offering several unique advantages over other MSC sources. Unlike MSCs derived from bone marrow or adipose tissue, umbilical cord artery MSCs are harvested from a more primitive and less invasive source, providing a younger and potentially more potent cell population. This origin confers a higher proliferative capacity and longer telomeres, which may enhance their self-renewal abilities and reduce the risk of senescence during extended culture. Furthermore, MSCs from the umbilical cord artery typically express a unique set of surface markers and have a lower immunogenic profile, making them particularly suitable for allogeneic applications and reducing the risk of immune rejection. In vitro, umbilical cord artery-derived MSCs demonstrate robust multipotency, with the ability to differentiate into adipocytes, osteoblasts, and chondrocytes when exposed to specific differentiation media. This versatility is comparable to that of MSCs derived from other tissues, but with the added benefit of their primitive nature, which may enhance their therapeutic potential. Each batch of these MSCs undergoes stringent quality control, including assessments for viability, purity, and potency, ensuring that the cells meet high standards for research applications. The cells are cryopreserved at early passages using a specialized cryomedium, maintaining their high viability (92% to 95%) upon thawing, which is crucial for their effective use in downstream applications. Overall, hMSCs from the umbilical cord artery offer a combination of easy accessibility, high proliferative capacity, and low immunogenicity, making them a valuable tool for a wide range of research studies, particularly those focusing on regenerative medicine and immune modulation. These cells, harvested with full donor consent, represent a high-quality and ethically sourced option for researchers looking to explore the full potential of mesenchymal stem cells in vitro.
Organism	Human
Tissue	Umbilical Cord - Artery
Applications	Drug testing, regenerative medicine, disease research

Characteristics

Age	Please inquire
Gender	Please inquire
Ethnicity	Caucasian
Morphology	Well-spread spindle shaped, fibroblast-like morphology for at least within 5 passages. Fewer than 2% cells exhibit spontaneous myofibroblast-like morphology within each passage.
Cell type	Stem cell

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Growth properties	Adherent

Identifiers / Biosafety / Citation

Citation	Human Mesenchymal Stem Cells, Whartons Jelly (HMSC-WJ) (Cytion catalog number 300685)
Biosafety level	1

Expression / Mutation

Antigen expression	A comprehensive panel of markers, including CD73/CD90/CD105 (positive) and CD14/CD34/CD45/HLA-DR (negative), are used in flow cytometry analysis to identify cultivated MSCs (P2-P3) prior to cryopreservation. These markers are recommended by the ISCT MSC committee.
Viruses	Donor is negative for HBV (PCR), Treponema pallidum (PCR), and HIV-1/2 (IFA). Cells are negative for HBV, HCV, HSV1, HSV2, CMV, EBV, HHV6, Toxoplasma gondii, Treponema pallidum, Chlamydia trachomatis, Ureaplasma urealyticum, and Ureaplasma parvum.

Handling

Culture Medium	Alpha MEM, w: 2.0 mM stable Glutamine, w/o: Ribonucleosides, w/o: Deoxyribonucleosides, w: 1.0 mM Sodium pyruvate, w: 2.2g/L NaHCO3
Medium supplements	Supplement the medium with 10% FBS, 2 ng/mL bFGF
Passaging solution	Trypsin-EDTA
Subculturing	Remove the old medium from the adherent cells and wash them with PBS that lacks calcium and magnesium. For T25 flasks, use 3-5 ml of PBS, and for T75 flasks, use 5-10 ml. Then, cover the cells completely with Accutase, using 1-2 ml for T25 flasks and 2.5 ml for T75 flasks. Let the cells incubate at room temperature for 8-10 minutes to detach them. After incubation, gently mix the cells with 10 ml of medium to resuspend them, then centrifuge at 300xg for 3 minutes. Discard the supernatant, resuspend the cells in fresh medium, and transfer them into new flasks that already contain fresh medium.
Seeding density	1 to 3 x 10^4 cells/cm^2
Fluid renewal	First fluid renewal after 24 hours, then every 2 to 3 days.

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Freeze medium	CM-1 (Cytion catalog number 800100)

Handling of cryopreserved cultures

1. Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
2. 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.
3. 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.
4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
5. 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.
6. Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
7. 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.
8. Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

Quality control / Genetic profile / HLA

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.