Product sheet

Human Mesenchymal Stem Cells - Bone Marrow (HMSC-BM) | 300665

General information

Description	Human Mesenchymal Stem Cells derived from Bone Marrow (HMSC-BM) represent a robust and versatile tool for in vitro research. These multipotent mesenchymal stromal cells (MSCs) possess the unique ability to self-renew and differentiate into a broad spectrum of cell types, including adipocytes, osteoblasts, and chondrocytes. The potential of HMSC-BM to differentiate into these three key lineages has been well-documented, making them invaluable for studies focused on regenerative medicine, tissue engineering, and cellular differentiation pathways. These MSCs are cultivated under stringent conditions, ensuring their multipotency and high viability post-thaw. One of the distinguishing features of HMSC-BM compared to MSCs derived from other sources, such as adipose tissue or umbilical cord, is their superior capacity for osteogenic differentiation. This makes them particularly useful in bone biology and orthopedic research, where understanding the molecular mechanisms governing bone formation and repair is crucial. Additionally, HMSC-BM exhibit a robust immunomodulatory profile, which makes them an excellent model for studying immune interactions and inflammatory responses. These unique characteristics also position HMSC-BM as a preferred choice for preclinical studies exploring bone marrow microenvironment, hematopoiesis, and the pathophysiology of bone marrow-related diseases. Each cryovial of HMSC-BM contains a minimum of 1 x 10^6 cells, with viability rates ranging between 92% to 95%, as determined by the Trypan Blue dye exclusion test. These cells are derived from bone marrow collected from healthy adult donors, all of whom have provided informed consent. To ensure the highest standards, each batch undergoes rigorous quality control testing to assess cell identification, purity, potency, and viability. This thorough testing guarantees that the MSCs meet strict criteria, making them suitable for a wide range of research applications, including cell biology studies, drug discovery, and the investigation of cellular responses to different stimuli. These cells are not intended for therapeutic or in vivo applications, and their use is confined to research purposes in a controlled laboratory environment.
Organism	Human
Tissue	Bone Marrow
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.

Human Mesenchymal Stem Cells - Bone Marrow (HMSC-BM) | 300665

Cell type	Stem cell
Growth properties	Adherent

Identifiers / Biosafety / Citation

Citation	Human Mesenchymal Stem Cells, Bone Marrow (HMSC-BM) (Cytion catalog number 300665)
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.

Human Mesenchymal Stem Cells - Bone Marrow (HMSC-BM) | 300665

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.