HS-5

305451

GENERAL INFORMATION

Description

The HS-5 cell line is a human bone marrow-derived mesenchymal stromal cell (MSC) model commonly used to study the supportive role of stromal cells in hematopoiesis and cancer development. Originally isolated and immortalized via the E6 and E7 human papillomavirus genes, HS-5 cells demonstrate fibroblast-like morphology and are known for secreting a wide array of cytokines and growth factors that are crucial for hematopoietic and immune cell interactions. Notable secreted factors include granulocyte colony-stimulating factor (G-CSF), granulocyte-macrophage colony-stimulating factor (GM-CSF), macrophage-CSF (M-CSF), stem cell factor (SCF), interleukin-6 (IL-6), IL-8, and IL-11, among others. These secretions enable HS-5 cells to sustain the growth and proliferation of hematopoietic progenitor cells in vitro, even under serum-free conditions, highlighting their functional similarity to primary MSCs in hematopoiesis support.
In oncology research, HS-5 cells serve as a model for examining the interactions between MSCs and cancer cells, particularly in studying tumor microenvironment-mediated cancer cell survival, immune modulation, and drug resistance. Studies have shown that HS-5 cells can protect acute myeloid leukemia (AML) cells from apoptosis induced by chemotherapeutic agents like cytarabine (Ara-C) and daunomycin (DNR), potentially through mechanisms involving cytokine signaling and direct cell-cell interactions. This protective effect of HS-5 cells enhances AML cell proliferation and reduces chemotherapy efficacy, making this cell line a valuable tool for modeling drug resistance in the bone marrow microenvironment. Additionally, HS-5 cells express MSC markers such as CD73, CD90, and CD105, though their expression levels may vary compared to primary MSCs.
Furthermore, HS-5 cells have been used to explore novel therapeutic approaches, such as testing the cytotoxic effects of nanomaterials like pristine graphene. Graphene exposure in HS-5 cells has been shown to induce mitochondrial dysfunction and oxidative stress, leading to apoptosis via increased reactive oxygen species (ROS) production and disrupted mitochondrial membrane potential, thereby serving as a model for evaluating nanoparticle toxicity and therapeutic potential in stromal cell interactions within the tumor microenvironment.

Tissue	Bone marrow, stroma
Disease	Normal

Synonyms

- HS5

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Adherent
GMO status	GMO-S1

GMO status details

GMO-S1: This human bone-marrow stromal cell line (HS-5) contains retroviral constructs encoding HPV-16 E6 and E7 oncogenes, supporting immortalization and transformation. The inserts are stably present in HS-5 cells. This classification applies only within Germany and may differ elsewhere.

Biosafety level	1

CHARACTERISTICS

Morphology	Fibroblast-like
Cell type	Fibroblast

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IDENTIFIERS

Citation

HS-5 (Cytion catalog number 305451)

NCBI TaxID	9606
Cellosaurus	CVCL_3720

EXPRESSION AND SUSCEPTIBILITY

Protein expression

Genes expressed: granulocyte colony-stimulating factor (G-CSF); granulocyte-macrophage-CSF (GM-CSF); macrophage-CSF (M-CSF); Kit ligand (KL); macrophage-inhibitory protein-1 alpha; interleukin-1 alpha (IL-1alpha); IL-1beta; IL-1RA; IL-6; IL-8; IL-11; leukemia inhibitory factor (LIF)

Viruses

Transformant: Human papillomavirus type 16 (HPV16).

HANDLING AND CULTURE

Culture medium

DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase
Fluid renewal	2 to 3 times per week

Thawing and culturing

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

QUALITY CONTROL AND CRYOPRESERVATION

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.

Freeze medium	As a cryopreservation medium, we use complete growth medium (including FBS) + 10% DMSO for adequate post-thaw viability, or CM-1 (Cytion catalog number 800100), which includes optimized osmoprotectants and metabolic stabilizers to enhance recovery and reduce cryo-induced stress.

Storage conditions

For long-term preservation, place vials in vapor-phase liquid nitrogen at about −150 to −196 °C. Storage at −80 °C is acceptable only as a short interim step before transfer to liquid nitrogen.

Shipping conditions

Cryopreserved cell lines are shipped on dry ice in validated, insulated packaging with sufficient refrigerant to maintain approximately −78 °C throughout transit. On receipt, inspect the container immediately and transfer vials without delay to appropriate storage.

DONOR

Donor age	30 years
Ethnicity	Caucasian

LEGAL AND SAFETY

Safety precautions

When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

Warranty

At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

Material Transfer Agreement required	Yes