Human Mesenchymal-LS Expansion Medium

Catalog No. SCM023

FOR RESEARCH USE ONLY
Not for use in diagnostic procedures.

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Introduction

Mesenchymal stem cells (MSCs) are non-hematopoietic cells with multi-lineage potential that hold great promise for regenerative medicine. In defined *in vitro* assays, mesenchymal stem cells have been shown to readily differentiate into lineage-specific cells that form bone, cartilage, fat, tendon, and muscle tissues.

Human Mesenchymal-LS Expansion Medium provides a low serum (2%) cell culture environment for human mesenchymal stem cells including those derived from human adipose and bone marrow tissues and ES/iPS cells. This low serum formulation have been shown to grow cells at rates that meet or exceed commercially available serum containing media, while maintaining excellent cell morphology. Human Mesenchymal-LS Expansion Medium is specific to human cells and should not be used to culture mouse or rat MSCs. The medium is packaged in a specially designed UV protective shrinkwrap for added stability, which includes a temperature gauge for added convenience. Human Mesecnhymal-LS Expansion Medium contains no antimicrobials and no phenol red, components that can cause cell stress and masking effects that may influence experimental result.

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Product Specifications

Description	Human Mesenchymal-LS Expansion Medium (Cat. No. SCM023)
Kit Components	Human Mesenchymal-LS Basal Medium (Part No. SCMM-BM) Human Mesenchymal-LS Supplement Kit (Part No. SCMM002-S)
Application	Human Mesenchymal-LS Expansion Medium is optimized for low-serum (2%) culture of human mesenchymal stem cells, and supports the growth of these cells in a 2% serum environment at rates equal to or greater than comparable media supplemented with much higher concentrations of FBS. Mesenchymal-LS Expansion Medium contains no antimicrobials and no phenol red; components that can cause cell stress and "masking effects" that may influence experimental results (these are not needed, or recommended, to achieve optimal cell performance).
Cells supported by Human Mesenchymal-LS Expansion Medium	• Human Adipose Mesenchymal Stem Cells (Cat. No. SCC038) • Human Bone Marrow Mesenchymal Stem Cells (Cat. No. SCR108) • Human ES Cell Derived Mesenchymal Stem Cells (Cat. No. SCC036)

Description	Part No.	Volume	Final Concentration in Supplemented Medium	Storage
Human Mesenchymal-LS Expansion Media	**SCM023**	**Kit**		See individual components
Human Mesenchymal-LS Basal Medium	**SCMM-BM**	480 mL		2-8℃
Human Mesenchymal-LS Supplement Kit, containing:	**SCMM002-S**			-20℃
rhFGF-b		0.5 mL	5 ng/mL	-20℃
Ascorbic Acid		0.5 mL	50 ug/mL	-20℃
L-Glutamine		18.75 mL	7.5 mM	-20℃
Hydrocortisone Hemisuccinate		0.5 mL	1.0 µg/mL	-20℃
rh Insulin		0.5 mL	5 µg/mL	-20℃
FBS		10 mL	2%	-20℃

Storage and Stability

Human Mesenchymal-LS Expansion Medium (Cat. No. SCM023).
Each medium kit consists of two components: a) a bottle of basal medium (Part No. SCMM-BM) and b) a supplement kit (Part No. SCMM002-S) containing various growth factors and components.

Human Mesenchymal-LS Basal Medium (Part No. SCMM-BM) should be stored at 2 to 8℃. The special UV protective packaging helps protect the medium from light damage; however uses should take care to protect the medium from extended exposure to light.

Human Mesenchymal-LS Supplement Kit (Part No. SCMM002-S) should be stored at -20℃. Do not use product beyond expiration date. All components are guaranteed stable until the expiration date stated on the individual labels.

Quality Control

These products are manufactured with the highest quality of raw materials, with exacting standards and production procedures to ensure lot-to-lot consistency. Every lot of medium is extensively tested for the following parameters:

Sterility testing:	Negative for bacterial and fungal growth
pH:	7.4 +/- 0.2
Cell testing:	Rate of proliferation and morphology
Osmolality:	270 +/- 10 mOsm
Endotoxin:	<0.5 EU/mL

Medium Preparation

Human Mesenchymal-LS Expansion Medium is provided as a kit containing a basal medium (480 mL) and a supplement kit containing supplements and growth factors, unique to the specific media/application. This allows you to prepare fresh medium each time, providing optimal cell culture conditions. To support proliferation, you must add the necessary supplements in the appropriate concentrations to the basal medium. The medium does not contain phenol red or antibiotics. These components are not necessary for cell proliferation, but may be added if desired.

Pre-warming the Medium

Medium will take from 10 to 30 minutes to warm to 37℃ depending on the volume. Medium temperature may be checked by referencing the thermometer attached to the side of the media bottle. Do not leave medium in water bath for extended periods. If only using a small volume of medium (less than 50 mL), warm only the volume needed in a sterile conical tube. Repeated warming of the entire bottle over extended periods may cause degradation of the medium and reduced shelf life.

Adding the Supplement

Supplement Kits contain sufficient reagents to supplement one 480 mL bottle of Human Mesenchymal-LS Basal Medium. Supplements should be thawed immediately prior to supplementation; Mix supplemented medium by gently pipeting up and down with a large volume pipette (25 or 50 mL) or gently invert the tightly closed 500 mL bottle. Do not shake or froth the medium. The supplemented medium may be stored at 2 to 8℃ for up to two weeks. All procedures should be done using sterile technique.

Please note that L-Glutamine is best warmed to 37℃ in a water bath, and shaken to dissolve the precipitate prior to use.

A Note on Optional Supplements

Phenol Red:
Phenol red is a pH indicator that is not required in cell culture and may adversely influence the behavior of some cell types, since it has estrogenic properties. Medium with phenol red will appear more yellow than red in acidic conditions and will appear more purple than red in basic conditions. This supplement is not included in the Human Mesenchymal-LS Expansion Medium, but may be added if desired.

Penicillin-Streptomycin-Amphotericin (PSA):
PSA is used to minimize contamination. These antimicrobials react with cells and may inhibit optimal growth. If proper sterile technique is used, antimicrobials should not be necessary.

Data Analysis

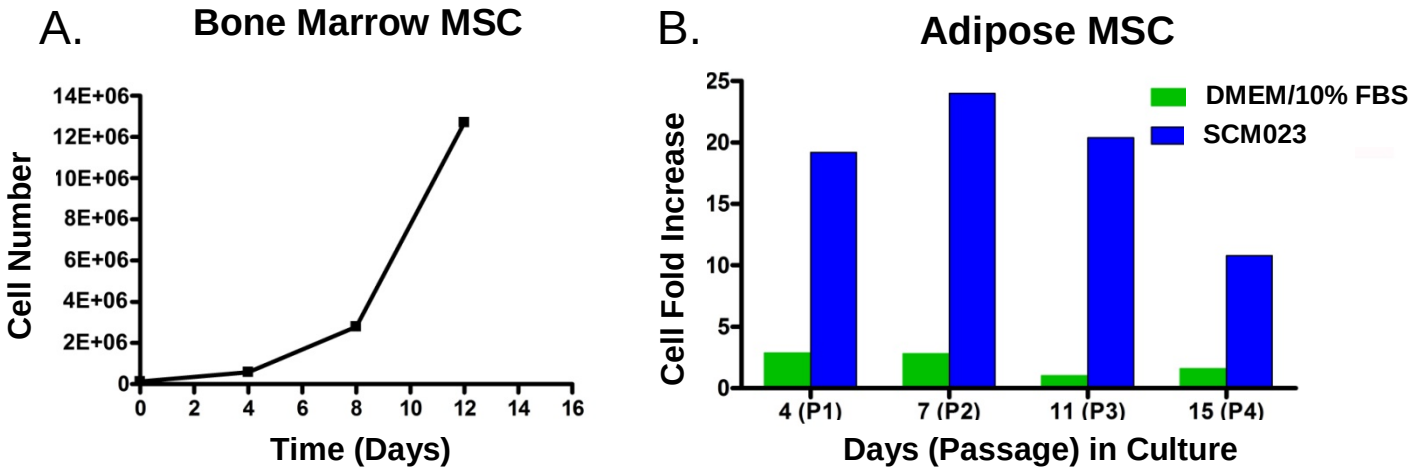

Figure 1. Improved proliferation of Human Bone-Marrow (Figure A, Cat. No. SCR108) and Adipose (Figure B, Cat. No. SCC038) Mesenchymal Stem Cells cultured in the Human Mesenchymal-LS Expansion Medium. Adipose MSCs cultured in the Human Mesenchymal-LS Expansion Medium (Cat. No. SCM023) for four passages yielded a 4-fold cell increase in cell number relative to the traditional DMEM medium containing 10% FBS.

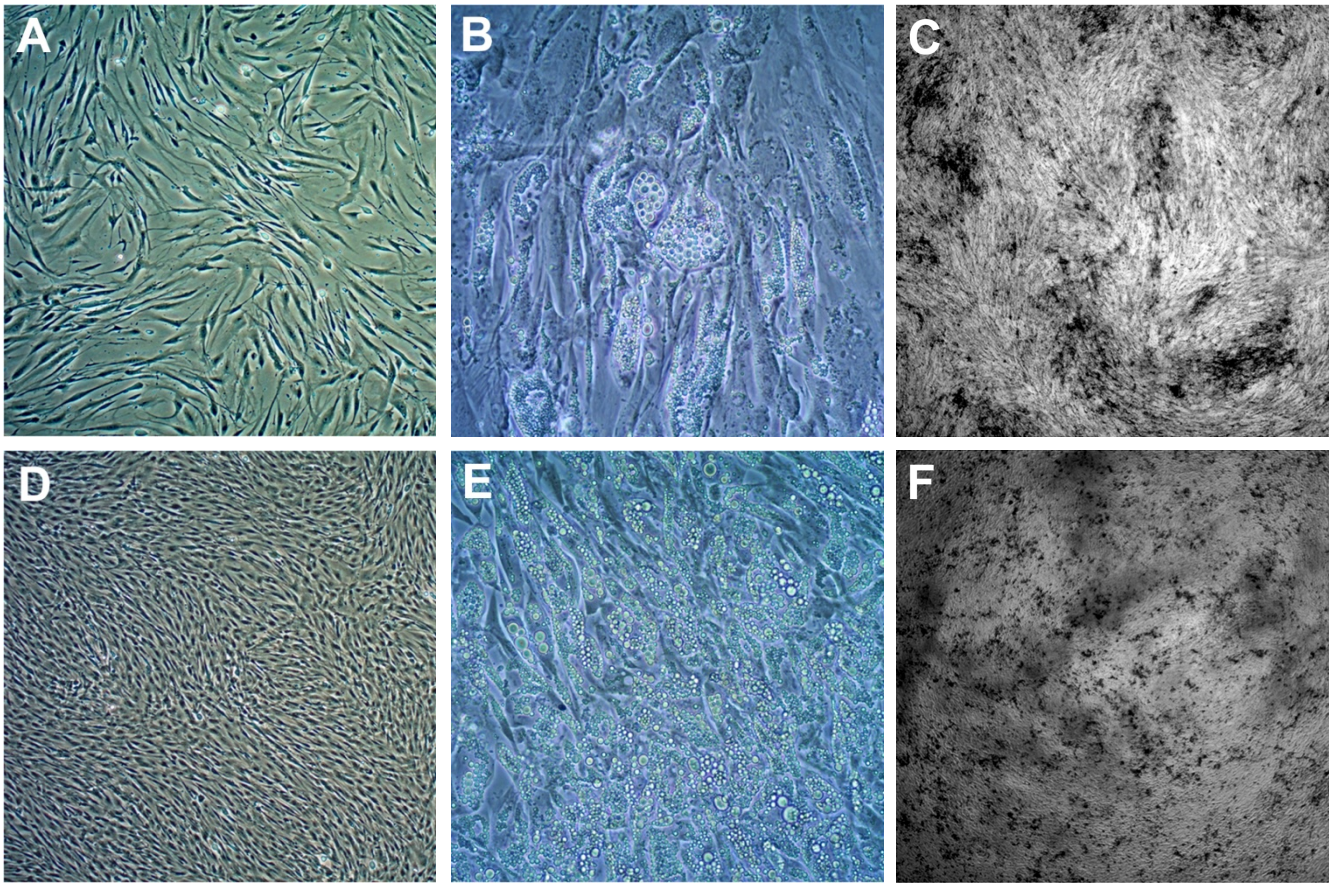

Figure 2. Bright-field images of human bone-marrow (**A**, Cat. No. SCR108) and adipose (**D**, Cat. No. SCC038) mesenchymal stem cells cultured in Human Mesenchymal-LS Expansion Medium for 3 passages. Human MSCs cultured in the medium for 3 passages maintained their multipotency and gave rise to adipocytes (**B, E**) and osteocytes (**C, F**) under the appropriate adipogenesis (Cat. No. SCR020) and osteogenesis (Cat. No. SCM121) differentiation conditions, respectively.

Troubleshooting

Potential Problems	Experimental Suggestions
No growth of cells	Be sure to add all supplements to Basal Medium. Ensure all supplements are within the expiration date.
Grainy morphology	Be sure to add all the supplements to the Human Mesenchymal-LS Basal Medium; remake if necessary.
Growth of cell culture slows down when 30% or more confluent	Increase the frequency of feeding or add additional volume of medium.

Related Products

The following products are available from EMD Millipore as separate items:

1. Human Bone-Marrow Mesenchymal Stem Cells (Cat. No. SCR108)
2. Human Adipose Mesenchymal Stem Cells (Cat. No. SCC038)
3. Human ES Cell Derived Mesenchymal Stem Cells (Cat. No. SCC036)
4. Human Mesenchymal Stem Cell Characterization Kit (Cat. No. SCR067)
5. FlowCellect™ Human Mesenchymal Stem Cell Characterization Kit (Cat. No. FCSC100184)
6. Mesenchymal Stem Cell Adipogenesis Kit (Cat. No. SCR020)
7. OsteoMAX-XF™ Differentiation Medium (Cat. No. SCM121)

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