DERIVE AND EXPAND MOUSE MESENCHYMAL STROMAL CELLS

MesenCult™ Expansion Kit (Mouse)

Mouse mesenchymal stromal cells (MSCs; also known as mesenchymal stem cells) are studied to gain insight into MSC biology and for preclinical investigations into the potential application of MSCs for cell therapy in humans.

The MesenCult™ Expansion Kit (Mouse; Catalog #05513) is optimized to derive and expand mouse MSCs and embryonic fibroblasts (MEFs; Figure 1). Complete MesenCult™ Expansion Medium is prepared by combining the basal medium and supplement, with or without MesenPure™. Mouse MSCs cultured in MesenCult™ Expansion Medium show greater long-term expansion compared to MSCs cultured in other commercial media (Figure 2). Add MesenPure™ to complete MesenCult™ Expansion Medium to reduce hematopoietic cell contamination, resulting in enriched MSC cultures as early as passage 0. This kit is compatible for use with mouse bone marrow (BM)-, adipose- and compact bone-derived MSCs, and MEFs.

Why Use MesenCult™ Expansion Kit (Mouse)?

EFFICIENT. Fast expansion of mouse MSCs with robust enrichment as early as passage 0.

VERSATILE. Optimized for use with mouse bone marrow-, compact bone- and adipose-derived MSCs and MEFs.

FUNCTIONAL. Obtain homogeneous mouse MSC cultures while maintaining trilineage differentiation potential.

RELIABLE. Rigorous raw material screening and quality control minimize lot-to-lot variability and increase reproducibility between experiments.

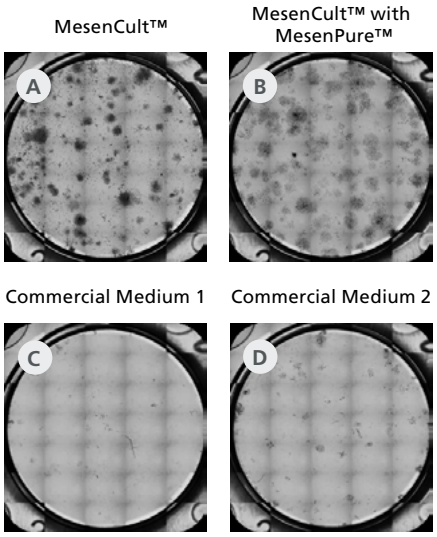

Figure 1. CFU-F Assay Comparing Mouse Bone Marrow (BM) MSCs Derived and Cultured in MesenCult™ Expansion Medium With and Without MesenPure™, and Other Commercially-Available Media

Numerous fibroblast colony-forming units (CFU-F) colonies were observed in cultures maintained in (A) MesenCult™ Expansion Medium (MesenCult™) and in (B) the same medium containing MesenPure™ (MesenCult™ with MesenPure™). Few to no colony formation was observed when cultures were maintained in (C) Commercial Medium 1 or (D) Commercial Medium 2. Seeding density: $5x10^4$ cells/cm^2.

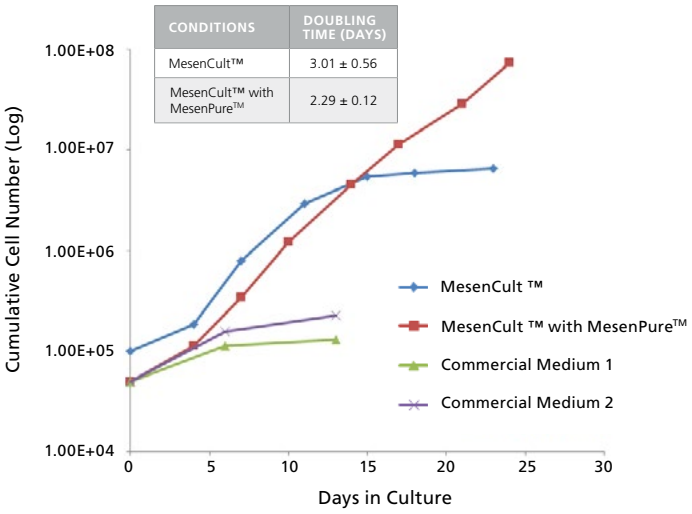

Figure 2. Mouse BM-Derived MSCs Expand Faster When Cultured in MesenCult™ Expansion Medium

Mouse BM MSCs, derived and cultured in MesenCult™ Expansion Medium (MesenCult™), show superior long-term expansion rates compared to Commercial Medium 1 and 2. The addition of MesenPure™ (MesenCult™ with MesenPure™) improves the expansion rate at later passages and reduces the doubling time of mouse MSCs to 2.29 versus 3.01 days for MSCs cultured in MesenCult™ without MesenPure™. Experiments using the MesenCult™ Expansion Kit (Mouse) were performed under hypoxic conditions. Experiments using Commercial Medium 1 and 2 were performed under normoxic conditions as recommended by their protocols. Data shown is from one representative experiment (n=3).

DERIVE AND EXPAND MOUSE MESENCHYMAL STROMAL CELLS

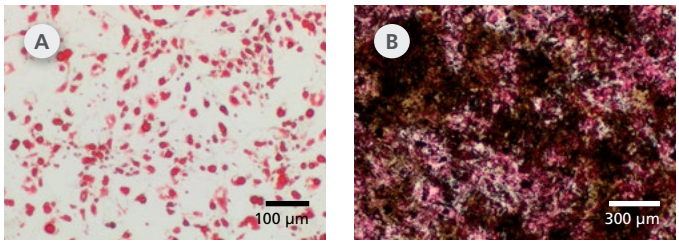

Figure 3. Mouse BM-Derived MSCs Cultured in MesenCult™ Expansion Medium with MesenPure™ Maintain Multi-Lineage Differentiation Potential

Mouse BM MSCs, derived and cultured in MesenCult™ Expansion Medium with MesenPure™, demonstrate robust differentiation to cells of (A) adipogenic and (B) osteogenic lineages when cultured in complete MesenCult™ Adipogenic Medium (Mouse) and MesenCult™ Osteogenic Stimulatory Medium (Mouse), respectively. Adipocytes were stained with Oil Red O and osteoblasts were stained for alkaline phosphatase activity and with silver nitrate (von Kossa). Compact bone- and adipose tissue-derived MSCs, and MEFs cultured in complete MesenCult™ Expansion Medium with or without MesenPure™ were also successfully differentiated into adipocytes and osteoblasts (data not shown).

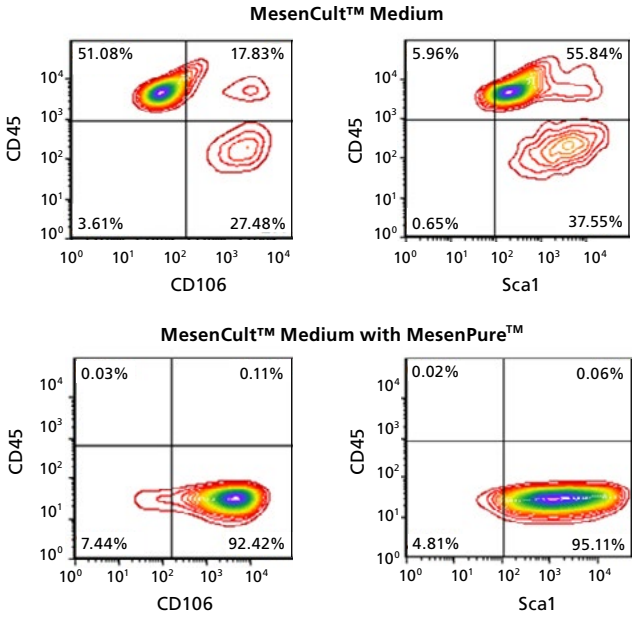

Figure 4. Mouse BM-Derived MSCs Cultured Using the MesenCult™ Expansion Medium Exhibit Characteristic MSC Surface Marker Expression

Mouse BM-derived MSCs were cultured in MesenCult™ Expansion Medium (MesenCult™) or in MesenCult™ Medium with MesenPure™. MSCs from passage 2 were immunolabeled for the mesenchymal surface markers CD106 and Sca1, and the hematopoietic marker CD45. Labeled cells were then analyzed by flow cytometry. MSCs cultured in MesenCult™ Medium show distinct populations of $CD45^+$ hematopoietic cells and $CD45^-$ ($CD106^+$ and $Sca1^+$) MSCs. Upon addition of MesenPure™ to MesenCult™ Medium, an enriched and homogenous population of $CD45^-$ ($CD106^+$ and $Sca1^+$) MSCs is obtained.

Product Information

PRODUCT	SIZE	CATALOG #	COMPONENT
MesenCult™ Expansion Kit (Mouse)	500 mL	05513	• MesenCult™ Basal Medium (Mouse) • MesenCult™ 10X Supplement (Mouse) • MesenPure™

Supporting Products for Mouse MSC Research

PRODUCT	CATALOG #	APPLICATION
MesenCult™ Osteogenic Stimulatory Kit™(Mouse)	05504	Complete medium to differentiate mouse MSCs and MEFs into osteoblasts.
MesenCult™ Adipogenic Differentiation Kit (Mouse)	05507	Complete medium to differentiate mouse MSCs and MEFs into adipocytes.
Hypoxia Incubator Chamber	27310	One chamber to generate hypoxic environment for tissue culture.
Single Flow Meter	27311	Meter to control gas flow into hypoxia incubator chamber.

Mouse MSCs cultured in complete MesenCult™ Expansion Medium are compatible with mouse MesenCult™ differentiation media, including MesenCult™ Osteogenic Stimulatory Kit (Mouse; Catalog #05504) and MesenCult™ Adipogenic Differentiation Kit (Mouse; Catalog #05507). A Hypoxia Incubator Chamber (Catalog #27310) is available to create a hypoxic environment. It is shown that mouse MSCs expansion rates are improved under hypoxic conditions.[1-2]

References

1. Caroti CM et al. (2017). A novel technique for accelerated culture of murine mesenchymal stem cells that allows for sustained multipotency. Sci Rep 7(1): 1-17.
2. Baustian C et al (2015). Isolation, selection and culture methods to enhance clonogenicity of mouse bone marrow derived mesenchymal stromal cell precursors. Stem Cell Res & Ther 6 (151).