DERIVE & EXPAND HUMAN MESENCHYMAL STROMAL CELLS

MesenCult™-ACF Plus

Mesenchymal stromal cells (MSCs; also known as mesenchymal stem cells) are studied to gain insight into their basic biology and to explore the potential utility of MSCs in cellular therapies. MSCs have demonstrated the capacity to modulate both innate and adaptive immune responses and to contribute to tissue engineering and regeneration applications.

MesenCult™-ACF Plus Medium Kit (Catalog #05445) is optimized to derive and expand MSCs from primary human bone marrow (BM). The ability of MesenCult™-ACF Plus Medium to derive MSC progenitors was measured using the CFU-F assay. Unlike other commercial xeno-free and serum-free formulations tested, MesenCult™-ACF Plus Medium Kit was able to derive CFU-F colonies from the mononuclear cell fraction of BM without the addition of 2.5% human serum (Figure 1). MSCs derived and expanded using this kit generate a greater total number of MSCs per passage compared to other commercial xeno-free and serum-free media (Figure 2). Expanded MSCs retain robust expansion rates, the capacity for in vitro trilineage differentiation into adipocytes, chondrocytes and osteoblasts (Figure 3), and exhibit characteristic MSC surface marker expression (Figure 4). MesenCult™-ACF Plus Medium is part of an optimized ACF workflow that covers the derivation, expansion, culture dissociation, and cryopreservation of human MSCs.

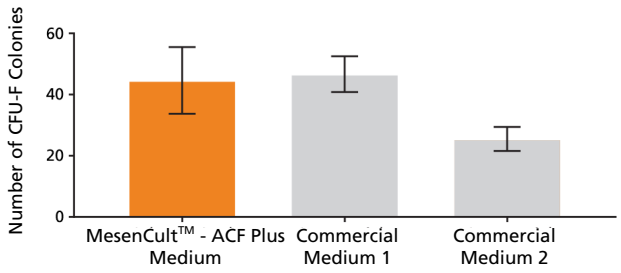

Figure 1. MesenCult™-ACF Plus Derives CFU-F Colonies Without the Addition of Human Serum

(A) An average of 45 CFU-Fs per million cells were observed when BM mononuclear cells were seeded in MesenCult™-ACF Plus medium. An average of 47 and 25 CFU-Fs per million cells were observed when cells were seeded in Commercial Medium 1 and Commercial Medium 2, respectively. Vertical lines indicate Standard Error of Mean (SEM). Commercial Medium 1 and Commercial Medium 2 were supplemented with 2.5% human AB serum to derive MSCs from BM, as per their protocols for derivation. No addition of serum is required when using MesenCult™-ACF Plus Medium.

Why Use MesenCult™-ACF Plus Medium?

CONSISTENCY. Animal component-free formulation improves experimental reproducibility.

HIGH-PERFORMANCE. Superior cell expansion when compared to serum-containing media.

FUNCTIONAL. Cultured MSCs retain robust expansion and trilineage differentiation capacities.

OPTIMIZED. Supports MSC derivation directly from primary human tissue without the addition of human serum.

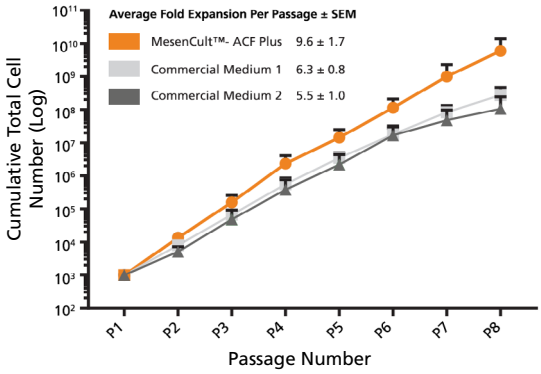

Figure 2. A Greater Total Number of Human BM-Derived MSCs are Generated When Cultured in MesenCult™-ACF Plus Medium

Human BM-derived MSCs cultured in MesenCult™-ACF Plus Medium underwent an average of 9.6 ± 1.7 fold expansion per passage compared to 6.3 ± .08 and 5.5 ± 1.0 fold expansion per passage over 8 passages when cultured in Commercial Medium 1 and Commercial Medium 2, respectively. Vertical lines indicate Standard Error of Mean (SEM).

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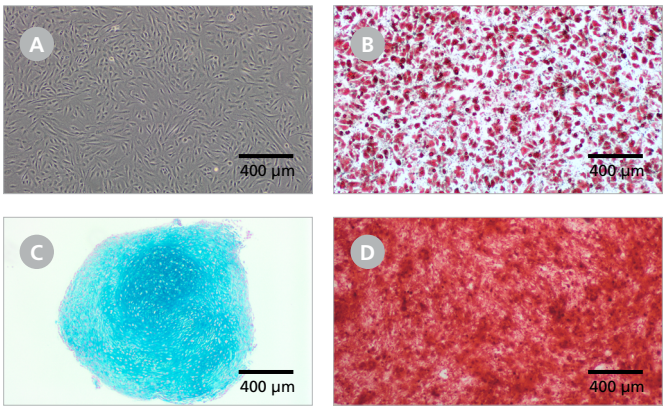

Figure 3. Human BM-Derived MSCs Expanded in MesenCult™-ACF Plus Medium Display Multi-Lineage Differentiation Potential In Vitro

(A) Human BM-derived MSCs expanded in MesenCult™-ACF Plus Medium from passage 2 differentiated into (B) adipocytes (Oil Red O staining), (C) chondrocytes (Alcian Blue staining) and (D) osteoblasts (Alizarin Red S staining).

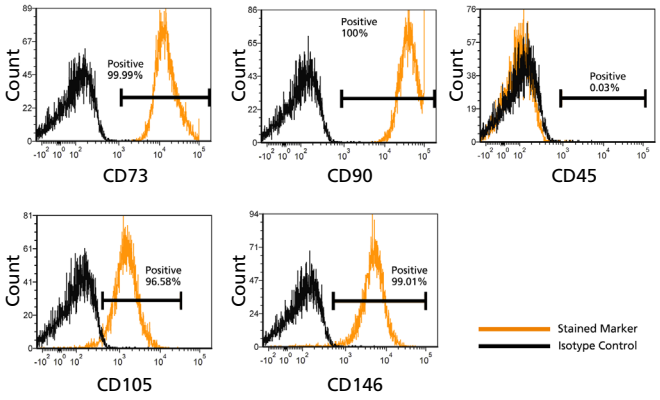

Figure 4. BM-Derived MSCs Expanded in MesenCult™-ACF Plus Medium Exhibit Characteristic MSC Surface Marker Expression

BM-derived MSCs were derived and expanded in MesenCult™-ACF Plus Medium. MSCs from passage 8 were stained for the surface markers CD73, CD90, CD45, CD105, CD146. Analyzed cells exhibited the characteristic surface marker expression of MSCs (high levels of CD73, CD90, CD105 and CD146) and lacked expression of the hematopoietic marker CD45.

Product Information

PRODUCT	CATALOG #	SIZE	COMPONENTS
MesenCult™-ACF Plus Medium Kit	05445	500 mL	• MesenCult™-ACF Plus Medium • MesenCult™-ACF Plus 500X Supplement
MesenCult™-ACF Plus Culture Kit	05448	1 Kit	• MesenCult™-ACF Plus Medium • MesenCult™-ACF Plus 500X Supplement • Animal Component-Free Cell Attachment Substrate

Supporting Products for Human MSC Research

PRODUCT	CATALOG #	APPLICATION
Animal Component-Free Cell Dissociation Kit	05426	Dissociation of human MSCs
MesenCult-ACF Freezing Medium	05490	Cryopreservation of human MSCs
MesenCult™-ACF Chondrogenic Differentiation Medium	05455	Differentiation of human MSCs to chondrocytes
MesenCult™ Adipogenic Differentiation Medium	05412	Differentiation of human MSCs to adipocytes
MesenCult™ Osteogenic Differentiation Kit	05465	Differentiation of human MSCs to osteoblasts
STEMdiff™ Mesenchymal Progenitor Kit	05240	Differentiation of human PSCs to mesenchymal progenitor cells

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