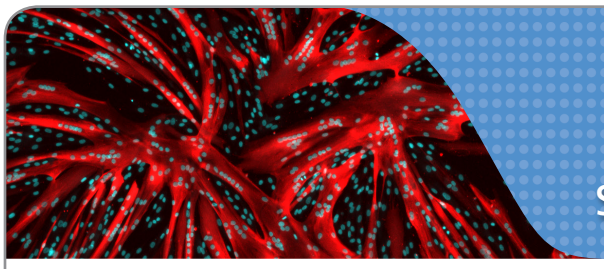

MyoCult™ Media and Reagents

For the Expansion and Differentiation of Skeletal Muscle Progenitor Cells (Myoblasts)

Background

Methods to culture skeletal muscle progenitor cells (myoblasts) and myotubes are important for the study of myogenesis and can serve as in vitro models for drug screening and disease modeling.

MyoCult™ media and reagents are specifically formulated to expand, maintain and differentiate primary human myoblasts. These specialized media are designed to provide researchers with standardized workflow and culture systems to minimize cell culture variability and increase experimental reproducibility.

MyoCult™ Expansion Kit

The **MyoCult™ Expansion Kit (Catalog #05960)** is optimized for the expansion and maintenance of primary or frozen human myoblasts. Complete MyoCult™ expansion medium is prepared by combining MyoCult™ Basal Medium and MyoCult™ 5X Supplement. Myoblasts cultured in complete MyoCult™ expansion medium show superior cell expansion (Figure 1) with sustained progenitor morphology when compared to other commercially available media (Figure 2). Complete MyoCult™ expansion medium is formulated to suppress the natural tendency of these cells to spontaneously differentiate during the expansion phase. This is demonstrated by the reduced expression of myogenic differentiation genes while inducing high expression of myogenic progenitor markers (Figure 3). In addition, greater than 95% of these culture-expanded myoblasts maintain a myogenic cell surface antigen profile ($CD45^-CD31^-CD29^+CD56^+$; Figure 4).

Myogenic progenitor cells expanded using the MyoCult™ Expansion Kit retain their ability to differentiate and fuse into multinucleated myotubes. For differentiation studies, use the **MyoCult™ Differentiation Kit (Catalog #05965)**.

MyoCult™ Expansion Kit (Human; Catalog #05960)

Why Use the MyoCult™ Expansion Kit?

ROBUST. Supports greater expansion of human myogenic progenitor cells than commercially available media.

OPTIMIZED. Suppresses the expression of myogenic differentiation genes while maintaining the expression of myogenic progenitor markers.

RELIABLE. Rigorous raw material screening and quality control minimize lot-to-lot variability.

CONVENIENT. Easy-to-use format and no additional growth factors are required.

COMPLETE SOLUTION. Culture-expanded myogenic progenitor cells are compatible with the MyoCult™ Differentiation Kit.

Achieve Increased Expansion

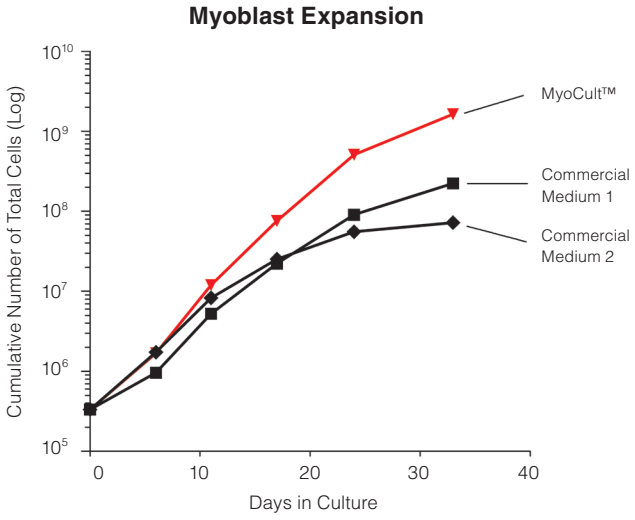

Figure 1. Enhanced Expansion of Human Myogenic Progenitors (Myoblasts) is Obtained When Using the MyoCult™ Expansion Kit

Myoblasts cultured in MyoCult™ expansion medium show superior expansion rate compared to other commercially available media. Data shown from one representative experiment (n=5).

TOLL FREE PHONE 1 800 667 0322 • PHONE +1 604 877 0713 • INFO@STEMCELL.COM • TECHSUPPORT@STEMCELL.COM
FOR GLOBAL CONTACT DETAILS VISIT OUR WEBSITE

Maintain Myoblast Morphology

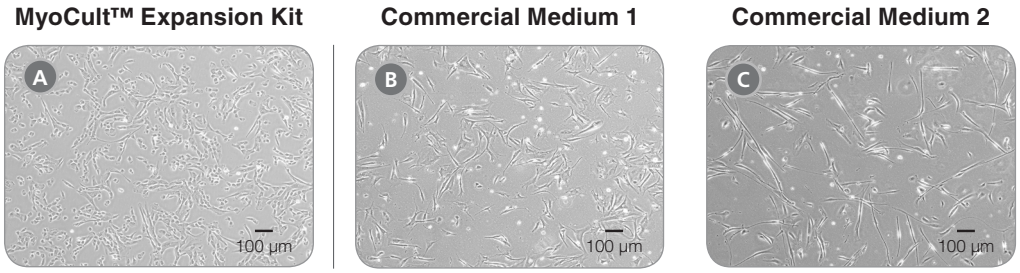

Figure 2. Human Myogenic Progenitor Cells Expanded in MyoCult™ Expansion Medium Maintain Myoblast Morphology

(A) Small and rounded myoblast morphology were maintained when myogenic progenitors were expanded in MyoCult™ expansion medium. Myoblasts expanded in (B) Commercial Medium 1 or (C) Commercial Medium 2 adopted stringy fibroblast-like characteristics. Images were taken at passage 5.

Maintain Expression of Myogenic Progenitor Markers and Suppress Expression of Differentiation Markers

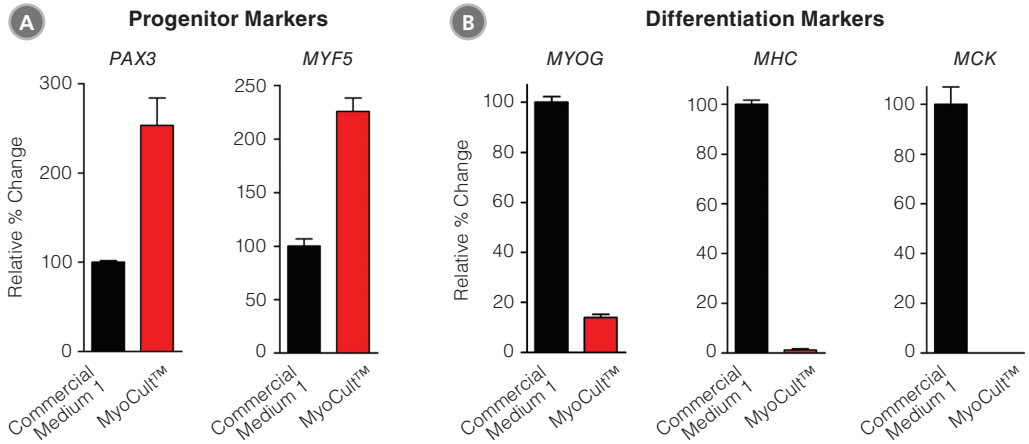

Figure 3. Myoblasts Expanded using the MyoCult™ Expansion Medium Show Increased mRNA Expression of Myogenic Progenitor Transcripts and Reduced Expression of Differentiation Transcripts

Human myogenic progenitors were expanded for 5 passages in MyoCult™ expansion medium or Commercial Medium 1. Total RNA was collected for qRT-PCR analysis of *MYF5*, *PAX3*, *MYOG*, *MHC* and *MCK* transcripts. (A) Increased levels of the progenitor markers, *PAX3* and *MYF5* transcripts, were observed when myoblasts were expanded using the MyoCult™ expansion medium. (B) Reduced expression of the myogenic differentiation markers, *MYOG*, *MHC* and *MCK* transcripts, were observed in myoblasts expanded in MyoCult™ expansion medium when compared to myoblasts expanded in Commercial Medium 1. Data expressed as a percent change in mRNA transcript levels compared to cells expanded in Commercial Medium 1.

Maintain Myogenic Surface Markers

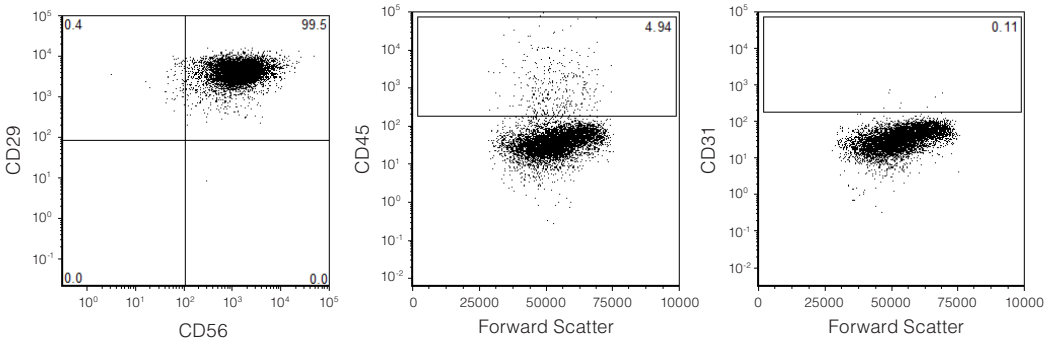

Figure 4. Human Skeletal Muscle Myogenic Progenitor Cells Cultured in MyoCult™ Expansion Medium are Homogeneous and Maintain Expression of Myogenic Progenitor Cell Surface Markers

Human myoblasts expanded for 5 passages in MyoCult™ expansion medium maintained the expression of typical myogenic progenitor cell surface markers (CD29 and CD56) and lacked the expression of hematopoietic (CD45) and endothelial (CD31) markers.

MyoCult™ Differentiation Kit

The **MyoCult™ Differentiation Kit (Catalog #05965)** is optimized for the efficient and reproducible differentiation of human skeletal muscle progenitor cells (myoblasts) into myotubes (Figure 5). Complete MyoCult™ Differentiation Medium is prepared by combining MyoCult™ Differentiation Basal Medium and MyoCult™ Differentiation 20X Supplement. This kit also includes a Cell Attachment Substrate to support optimal adherence and enhanced myotube morphology. Myotube cultures generated from the MyoCult™ Differentiation Kit can serve as a robust two-dimensional in vitro myofiber model for myogenic studies.

MyoCult™ Differentiation Kit (Human; Catalog #05965)

Why Use the MyoCult™ Differentiation Kit?

ROBUST. Supports differentiation of myoblasts to multinucleated myotubes with robust expression of myosin heavy chain.

RELIABLE. Rigorous raw material screening and quality control minimize lot-to-lot variability.

OPTIMIZED. Attachment substrate is included to support optimal adherence and enhanced myotube morphology.

Streamline Your Myogenic Research

The MyoCult™ Differentiation Kit is designed to work with primary human myogenic progenitor cells expanded using the MyoCult™ Expansion Kit. See page 1 for more information on the MyoCult™ Expansion Kit.

MyoCult™ Media and Reagents

For the Expansion and Differentiation of Skeletal Muscle Progenitor Cells (Myoblasts)

Achieve Robust Differentiation of Myoblasts to Myotubes

Myoblasts | Myotubes | MyoCult™ Differentiation Medium

Figure 5. MyoCult™ Differentiation Medium Induces Robust Differentiation of Myotubes from Human Myoblasts

(A) Myogenic progenitor cells expanded in MyoCult expansion medium expressed MyoD (green) and desmin (red). (B) Robust differentiation of myoblasts (shown in (A)) to multinucleated myotubes expressing myosin heavy chain ($MyHC^+$) was achieved following culture in MyoCult™ Differentiation Medium for as little as 5 days. (C) A fusion index showing approximately 75% of total nuclei were found within myotubes expressing MyHC.

Product Information

PRODUCT	SIZE	CATALOG #	COMPONENTS
MyoCult™ Expansion Kit	500 mL	05960	MyoCult™ Basal Medium (Human), 400 mL MyoCult™ 5X Supplement (Human), 100 mL
MyoCult™ Differentiation Kit	1 Kit	05965	MyoCult™ Differentiation Basal Medium (Human), 190 mL MyoCult™ Differentiation 20X Supplement (Human), 10 mL Animal Component-Free (ACF) Cell Attachment Substrate, 1 mL

Accessory Products

PRODUCT	CATALOG #
Anti-Human CD56 (NCAM) Antibody, Clone HCD56	60021
Anti-Human CD45 Antibody, Clone 2D1	60123
Anti-Human CD45 Antibody, Clone HI30	60018
CryoStor® CS10	07930

For more information on MyoCult™ and accessory products available for skeletal muscle progenitor cell research, please visit **www.stemcell.com/myogenicworkflow**.