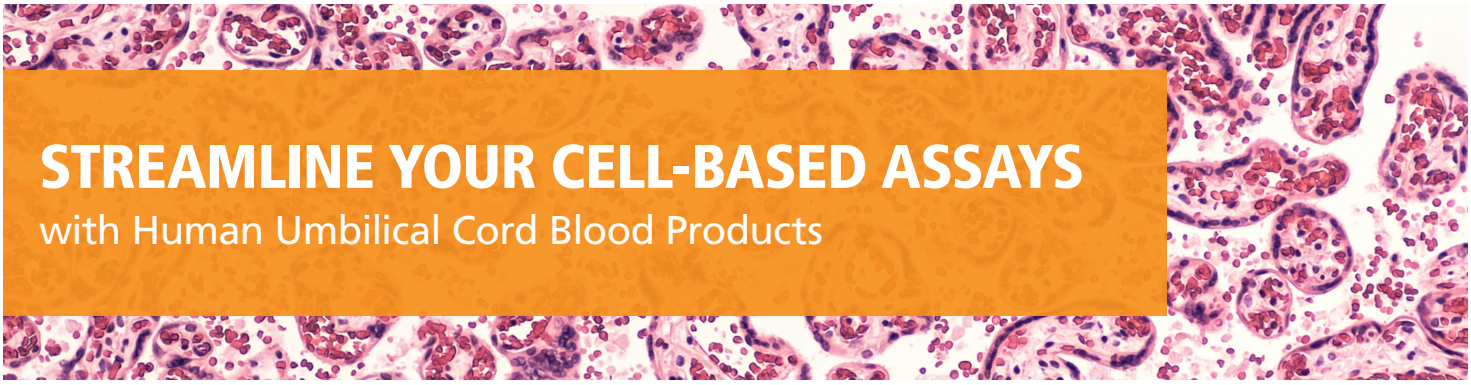


STREAMLINE YOUR CELL-BASED ASSAYS

with Human Umbilical Cord Blood Products

Primary cell-based approaches reduce the need for extensive in vivo validation and facilitate the translation of basic research into preclinical or clinical applications. Umbilical cord blood (CB) is a rich source of human primary cells that retain key aspects of the tissue of origin and are more reflective of donor variability, including human leukocyte antigen (HLA) type and cytomegalovirus (CMV) status, than cell lines[1,2]. Using CB products in your research can increase the physiological relevance of cell culture systems, enabling you to generate data that is more predictive of in vivo outcomes.

CB-derived cells are an advantageous choice for developing screening assays for drug discovery, regenerative cell therapy, and immune modulation, due to their enhanced capacity for progenitor cell proliferation, multilineage differentiation, and self-renewal in vitro. $CD34^+$ hematopoietic stem and progenitor cells (HSPCs) derived from CB are more naïve than cells derived from other tissues, making them ideal for transplantation studies.

A key factor for efficient, high-quality cell-based research is working with a reliable supplier who understands and supports your specific requirements. STEMCELL Technologies accommodates changing researcher needs with personalized service, customizable products, flexible services, and help with regulatory compliance. Additionally, with the option to reserve entire lots to pre-screen cells for your applications, we help ensure you get the cells you need. Discover our broad range of ethically sourced human CB products below, including plasma, mononuclear cells (MNCs), HSPCs, and other immune cell subsets to streamline your research.

1. Pan C et al. (2009) Comparative proteomic phenotyping of cell lines and primary cells to assess preservation of cell type-specific functions. Mol Cell Proteomics 8(3): 443–50.
2. Capes-Davis A et al. (2010) Check your cultures! A list of cross-contaminated or misidentified cell lines. Int J Cancer 127(1): 1–8.

Why Use Human Primary Cells from STEMCELL?

PHYSIOLOGICALLY RELEVANT. Choose cells that are more physiologically representative of cells in vivo.

ETHICALLY SOURCED. Access donor samples collected using regulatory authority-approved consent forms and protocols**.**

FLEXIBLE. Reserve large numbers of cryopreserved cells and start experiments on your schedule with cells you've already tested.

EFFICIENT. Reduce time spent collecting and culturing primary cells.

Figure 1. Frozen Human Cord Blood Plasma

Human plasma (Catalog #70020) isolated from umbilical cord blood using centrifugation.

RESOURCE

Frequently Asked Questions on Primary Cells
www.stemcell.com/primarycellsfaqs

Plasma

Frozen human plasma is isolated using centrifugation from CB collected using citrate phosphate dextrose (CPD) as an anticoagulant. Plasma can be applied in a wide range of therapeutic uses as it contains a variety of cytokines, chemokines, and high amounts of the various growth factors required for cell maintenance during hematopoiesis.

Mononuclear Cells

MNCs are obtained by density gradient centrifugation of whole CB. Specific cell types are subsequently purified using STEMCELL's cell isolation reagents. Cryopreserved MNCs can be used in a variety of downstream applications, including expansion and/or differentiation with StemSpan™ media and supplements, or enumeration of multipotent and lineage-committed hematopoietic progenitor cells (HPCs) in the colony-forming unit (CFU) assay with MethoCult™ methylcellulose-based medium (Figure 3).

High-resolution HLA typing is available upon request.

Figure 2. Frozen Human Cord Blood Mononuclear Cells

Human CB mononuclear cells (Catalog #70007) are isolated from umbilical cord blood using density gradient separation and cryopreserved in animal component-free CryoStor® CS10 medium (Catalog #07930).

Hematopoietic Stem and Progenitor Cells

HSPCs are a heterogeneous population of cells that include multipotent stem cells as well as lineage-committed progenitor cells of all mature blood cells. HSPCs are characterized in part by the expression of cell surface protein CD34. CB CD34$^+$ cells are isolated from MNCs and cryopreserved using StemSpan™ SFEM II (Catalog #09605) with 10% DMSO. Choose CB CD34$^+$ cells derived from a single CB unit or access large lots of CB CD34$^+$ cells derived from multiple CB units.

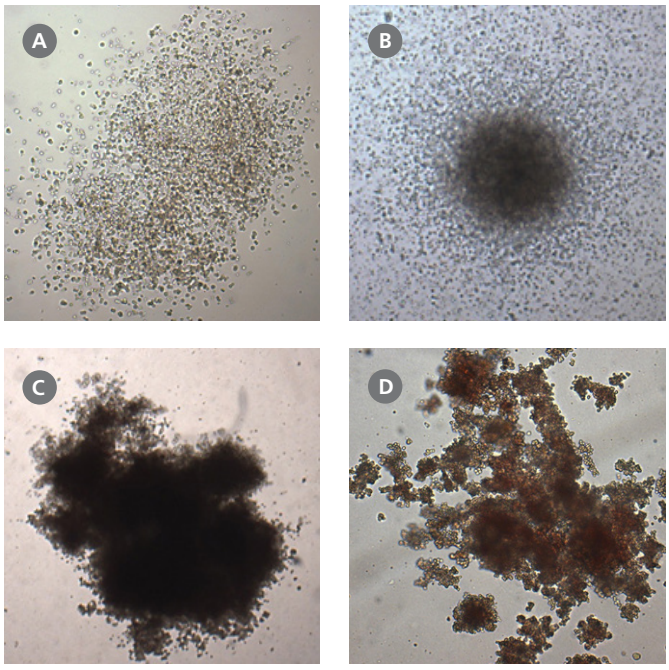


Figure 3. Cryopreserved Cord Blood mononuclear cells Generate Hematopoietic Colonies in colony-forming unit Assays

Cord Blood mononuclear cells (Catalog #70007) were cultured in MethoCult™ H4034 Optimum Medium (Catalog #04034) for 14 days. Hematopoietic progenitor cells within the mononuclear cells population generated multiple colonies derived from (A,B) colony-forming unit - granulocyte/macrophage (CFU-GM) and (C,D) burst-forming unit - erythroid (BFU-E). Colonies shown here were imaged on day 14 using an inverted microscope with a 4X objective lens.

VIDEO

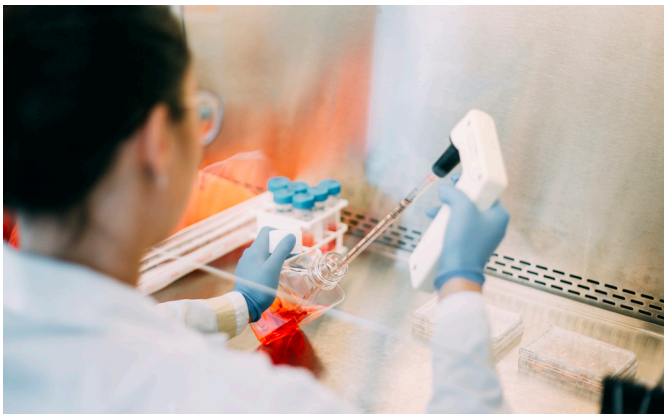
How to Thaw Frozen Human Primary Cells

www.stemcell.com/how-to-thaw-frozen-human-primary-cells.html

CONTACT US

Contact Human Primary Cell Team

www.stemcell.com/contact-primary-cells.html



Tools for Isolation and Expansion of CD34⁺ Cells from Human Cord Blood

The isolation of CD34⁺ cells from human CB is an important step in HSPC research. With a low frequency of CD34⁺ cells in CB (typically 0.1 - 1% of nucleated cells) and variable cell quality and viability between different CB samples, great care must be taken to achieve high purity and recovery. Choose from a variety of EasySep™ cell separation kits (Catalog #17896, #17897) that combine the specificity of monoclonal antibodies with the simplicity of a column-free magnetic system, allowing you to isolate CD34⁺ cells easily and efficiently from whole CB containing different amounts of platelets.

After isolation, CD34⁺ cells may be cultured using specialized cell culture media such as StemSpan™ serum-free media supplemented with cytokines and/or other supplements. StemSpan™ expansion supplements contain optimized combinations of cytokines and supplements to either promote the expansion of HSPCs, or encourage their lineage-specific differentiation to generate large numbers of mature erythroid, megakaryocyte, or myeloid cells, depending on the type of supplement used. Purified CD34⁺ cells can also be analyzed in CFU assays using methylcellulose-based MethoCult™ medium, and in LTC-IC assays using MyeloCult™ medium.

For a complete listing of cord blood primary cell products, please visit **www.stemcell.com/cells-cord-blood**.

Rely on STEMCELL for High-Quality, Ethically Sourced Human Primary Cells

At STEMCELL, we are committed to providing high-quality, ethically sourced human primary cells, specialized cell isolation products, standardized cell culture media, and accessory tools for your research. Reduce the amount of time and effort associated with pre-screening cells from different lots at the start of each experiment by reserving entire lots of cryopreserved cells while you test them in your assays. This policy ensures that your preferred cells are ready for your next experiment, without the need to pre-screen again.

Our human primary cell products are ethically sourced using Informed Consent Forms (ICFs) and protocols approved by either an Institutional Review Board, the Food and Drug Administration (FDA), the U.S. Department of Health and Human Services, and/or an equivalent regulatory authority. Donations are performed in the United States in compliance with applicable federal, state, and local laws, regulations, and guidance. Donors are pre-screened for general health and viral status, including HIV-1, HIV-2, hepatitis B, and hepatitis C. Additional screening or analysis is available upon request. Our Quality Assurance, Quality Control, and Regulatory Affairs departments are ready to assist you with any necessary documentation to meet specific institutional requirements, including supplier approval for ease of procurement.

Most purified cells are isolated using column-free cell isolation technology and cryopreserved in defined, serum-free media. State-of-the-art equipment, including automated cryogenic storage systems and cryogenic sample carriers, ensure cold chain custody management and high sample integrity. Cells are shipped on your choice of dry ice or liquid nitrogen, with a Certificate of Analysis indicating guaranteed Quality Control testing results, including cell count, viability, and purity. STEMCELL's Quality Management System is certified to ISO 13485, Medical Devices.

Characterization Services

Save time by letting STEMCELL characterize your cells. Reserve multiple lots before selecting your lot of interest based on the test results. The following additional characterization services can be requested:

- High-resolution HLA typing (Class I and II)
- CMV status
- EBV status
- Vaccination status

Product Information

Cryopreserved Cord Blood Products[1,2,4,5]

Description	Quantity	Catalog #
Mononuclear Cells	15 million cells	70007.1
	50 million cells	70007.2
	150 million cells	70007
CD34$^+$ Cells (Mixed Donor)	0.2 million cells	70008.1
	0.5 million cells	70008.3
	1 million cells	70008
CD34$^+$ Cells (Single Donor)	0.2 million cells	70008.2
	0.5 million cells	70008.4
	0.6 million cells	200-0000
	0.7 million cells	200-0001
	0.8 million cells	200-0002
CD36$^+$ Cells[3]	1 million cells	70009

Description	Quantity	Catalog #
CD19$^+$ B Cells	1 million cells	70013
	2.5 million cells	70013.1
	5 million cells	70013.2
Pan-T Cells	15 million cells	70014
CD4$^+$ T Cells	15 million cells	70015
CD4$^+$CD45RA$^+$ T Cells	15 million cells	70017
CD8$^+$ T Cells	5 million cells	70016
CD14$^+$ Monocytes	5 million cells	70018
CD56$^+$ NK Cells	1 million cells	70019
Plasma	10 mL	70020.1
	20 mL	70020.2
	30 mL	70020.3
	40 mL	70020.4
	50 mL	70020

Cell Thawing Instrument[6]

Product	Catalog #
ThawSTAR® CFT2 Automated Thawing System	100-0650
ThawSTAR® CFT2 Transporter	100-0642
ThawSTAR® CFT2 Confirmation Vials	100-0643
ThawSTAR® CFT2 IOPQ Kit	100-0730

1 Umbilical cord blood is collected using citrate-phosphate-dextrose (CPD) as the anticoagulant.
2 High-resolution HLA typing and CMV status are available upon request.
3 Cultured Cell Product.
4 Cryopreserved Products: Donors are screened for HIV-1, HIV-2, hepatitis B, and hepatitis C. If the donor has tested negative within 90 days prior to donation, the product will be shipped with the Certificate of Analysis (CoA).
5 Certain cryopreserved products are only available in select territories. Please contact Product and Scientific Support (**techsupport@stemcell.com**) for further information.
6 ThawSTAR® CFT2 is not available for sale in China, Hong Kong, Taiwan, Japan, or South Korea.

For more information on how we can support your custom requests, shipping requirements, and more, visit **www.stemcell.com/primarycells** or contact our scientific support at **techsupport@stemcell.com**.