PERIPHERAL BLOOD LEUKOPAKS

To Streamline Your Large-Scale Studies

Leukopaks are enriched leukapheresis products containing a variety of immune cells, including T cells, B cells, natural killer (NK) cells, monocytes, and more. Compared to whole blood and buffy coat, a full-size leukopak contains much higher concentrations of leukocytes per volume—typically greater than 9 billion cells in an average volume of < 200 mL. This makes leukopaks an ideal source of human primary cells when large numbers of cells are required from a single donor, especially for researchers working on adoptive cell therapy, T cell receptor (TCR) sequencing, and immunotherapy development.

STEMCELL Technologies offers fresh mobilized leukopaks as well as fresh and frozen normal leukopaks—collected in transfer bags using stringent and consistent protocols, and are offered in full, half, quarter, and tenth sizes. Additionally, fresh and frozen leukopaks collected from donors diagnosed with a solid tumor cancer, hematological cancer, autoimmune disease, or inflammatory disease are also available in various sizes. Each full-sized leukopak is produced from ~2 - 3x blood volumes using the Spectra Optia® Apheresis System, with acid-citrate-dextrose solution A (ACDA) as the anticoagulant.

A key factor for efficient, high-quality cell-based research is working with a reliable supplier who understands and supports your specific requirements. STEMCELL accommodates changing customer needs with personalized service, customizable products, flexible services, and help with regulatory compliance. Discover our range of ethically sourced leukopaks to streamline your research.

Figure 1. Human Peripheral Blood Leukopak - Full-Size (A) Mobilized Leukopak, G-CSF, Fresh, (B) Normal Leukopak, Fresh and (C) Normal Leukopak, Frozen

(A) Fresh Mobilized Leukopak, G-CSF (Catalog #200-0604) from donor mobilized with G-CSF (NEUPOGEN®) or filgrastim, (B) Fresh Leukopak (Catalog #70500) from normal donor and (C) Frozen Leukopak (Catalog #200-0130) from a normal donor, containing peripheral blood mononuclear cells (PBMCs) enriched using the Spectra Optia® Apheresis System.

Why Use Human Peripheral Blood Leukopaks from STEMCELL?

- Choose cells that are more physiologically representative of cells in vivo.
- Access donor samples collected using regulatory authority-approved consent forms and protocols.
- Start your experiments on your schedule without being restricted by the availability of tissue.
- Obtain large numbers of single-donor leukocytes, including PBMCs, T cells, and more.
- Reduce time spent collecting and culturing primary cells.

RESOURCES

Leukopak Processing Protocol
www.stemcell.com/LeukopakProcessing

RESOURCES

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

Normal Leukopaks, Fresh*

Fresh leukopaks are typically used to study the functions of white blood cells within a short period of time after collection, as they contain viable and functional white blood cells that can be used immediately without loss of viability or functionality. Fresh leukopaks are available in full, half, quarter, and tenth sizes. STEMCELL's recent stability study suggests that fresh leukopaks can be stored at 2 - 8°C for up to 5 days post-apheresis.

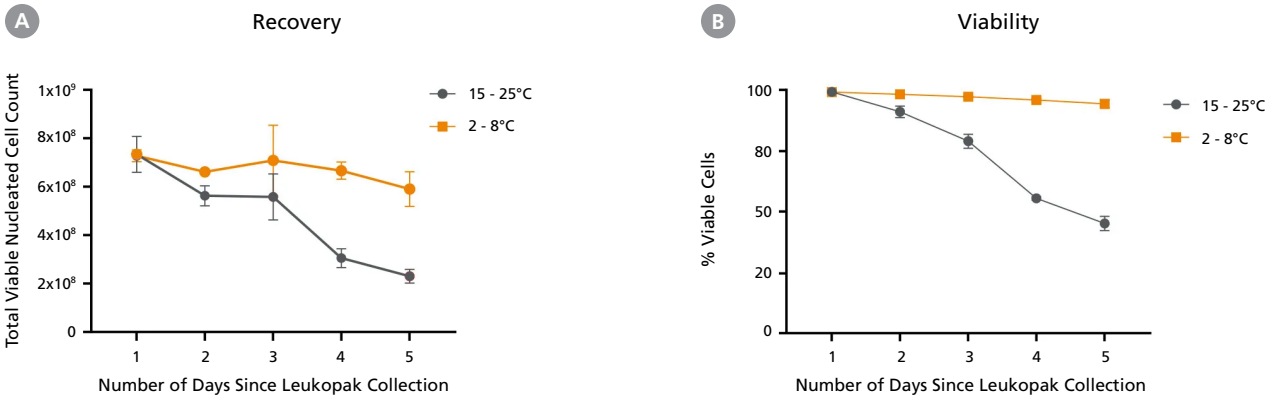

Figure 2. Recovery of Viable Cells Is Higher When Leukopaks Are Stored at Fridge Temperature Compared to Room Temperature

Stability of fresh leukopaks was evaluated after storage for up to 5 days after collection, at a refrigerated temperature (FT; 2 - 8°C) or at room temperature (RT; 15 - 25°C). Full leukopaks were collected from three unique donors, then divided into ten equally sized fractions and stored at FT or RT (n = 5 at each temp, per donor). Over the following 5 days, one 1/10th leukopak fraction was processed from each condition daily, to identify changes in cellular composition and functionality that may have occurred during storage. (A) Viable cell yield and (B) percentage cell viability were determined daily, following red blood cell (RBC) lysis of leukopak fractions. By Day 5 after collection, leukopak fractions stored at RT showed a 68% loss of viable cells and an accompanying 54% decrease in cell viability. Conversely, those stored at FT showed a much less pronounced 19% decrease of viable cells and just 5% decrease in viability over the 5 days. All data points represent average ± standard deviation values from leukopak fractions of 3 unique donors.

RESOURCES

Fresh Leukopak Stability Study
www.stemcell.com/LeukopakStabilityStudy

PRODUCT

Easy 250 EasySep™ Magnet
https://www.stemcell.com/easy250magnet

RESOURCE

Webinar: Leukopak Processing:
Tips & Tricks for Streamlined Cell Isolation
www.stemcell.com/LeukopakWebinar

*Certain fresh or cryopreserved products are only available in select territories. Please contact your Sales representative or Product and Scientific Support (techsupport@stemcell.com) for further information.

Normal Leukopaks, Frozen or Cryopreserved*

Frozen leukopaks are ideal for assays requiring a large number of cells for experiments conducted over extended periods of time as they are cryopreserved and stored long-term at a subzero temperature (normally ≤ -135°C). At STEMCELL, frozen leukopaks are processed shortly after collection, following stringent protocols, and cryopreserved in CryoStor® CS10—preserving quality and ensuring optimal cell viability and purity post-thaw. Frozen leukopaks are available in full, half, quarter, and tenth sizes.

RESOURCE

Human Peripheral Blood Leukopaks
https://www.stemcell.com/pbleukopaks

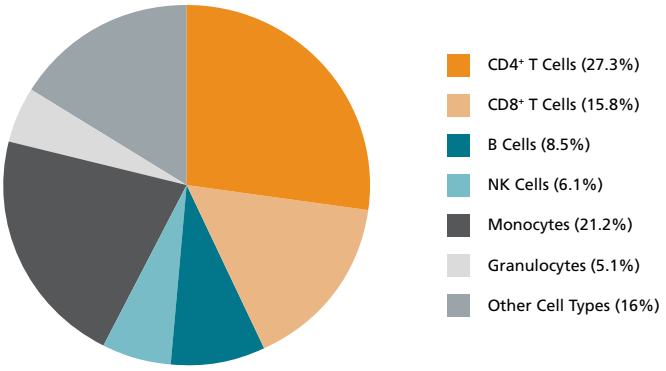

Figure 3. Mean Percentages of Cell Subpopulations in a Leukopak

Representative chart showing the average frequencies of major immune subsets in leukopak products, as measured by flow cytometry prior to cryopreservation. Values shown are mean percentages of total viable leukocytes present in a leukopak (n ≥ 30).

Table 1. Factors to Consider When Choosing the Right Leukopak Product for Your Research

Factor	Fresh Leukopaks	Frozen Leukopaks
Cell Type and Functionality	Optimal for experiments requiring high cell functionality or sensitive cell types such as NK cells and dendritic cells. Isolated cells have higher viability as no cryopreservation step is involved.	Cryopreservation ensures long-term stability of cells with ≥ 90% viability. Cells cryopreserved on the same day as collection typically outperform cells cryopreserved after overnight shipment.
Logistics and Availability	Inherent risk of shipping delays can impact the quality of cells. Fresh leukopaks are less readily available.	Eliminate the inherent risk of shipping delays, with no decrease in cell quality. Frozen leukopaks are more readily available and can be used for multiple experiments.
Downstream Application	Ideal for time-sensitive assays and assays requiring optimal cell functionality. Fresh leukopaks can be processed and cryopreserved upon receipt.	Suitable for assays requiring a large number of cells or experiments conducted over extended periods of time. It is not recommended to re-cryopreserve as a second freeze-thaw will result in increased cell death.

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Product Information

Normal Leukopaks[1]

Description	Anticoagulant	Quantity	Catalog #	MINIMUM CELL COUNTS
Fresh Peripheral Blood Leukopak[2,3,4]	ACDA[6]	Tenth Size	200-0092	≥ 1 billion
		Quarter Size	70500.2	≥ 2.5 billion
		Half Size	70500.1	≥ 5 billion
		Full Size	70500	≥ 10 billion
Frozen Peripheral Blood Leukopak[5]	ACDA[6]	Tenth Size	200-0470	≥ 900 million
		Quarter Size	200-0132	≥ 2.5 billion
		Half Size	200-0131	≥ 5 billion
		Full Size	200-0130	≥ 9 billion

1. *High-resolution HLA typing and CMV status are available upon request.*
2. *Fresh products are only available in select territories. Please contact Product and Scientific Support (techsupport@stemcell.com) for further information.*
3. *A full-size fresh leukopak typically contains 1.1 ± 0.3 x 10^{10} cells and has a volume of approximately 120 mL. Flow cytometry plots and purity analysis are available for specific lots and may be proactively requested for an additional fee.*
4. *Fresh leukopak products are shipped by default in certified refrigerated packaging capable of holding a constant internal temperature range of 2 - 8°C for a period of up to 48 hours.*
5. *The Certificate of Analysis (CoA) for frozen leukopaks includes flow cytometry plots showing the percentage of monocytes (CD14+), B cells (CD19+), T cells (CD3+, CD4+, CD8+), and NK cells (CD56+CD3-).*
6. *ACDA - Acid Citrate Dextrose Solution A.*

Disease-Sourced Leukopaks, Fresh or Frozen*

Disease-sourced leukopaks are ethically sourced leukapheresis products from patients diagnosed with a specific autoimmune or inflammatory disorder, hematological cancer, or solid tumor cancer. These products enable researchers to study disease-specific immune responses, biomarker discovery, and drug development.

Fresh leukopaks sourced from donors diagnosed with a specific autoimmune or inflammatory disease are available in half and full sizes and leukopaks sourced from donors with a hematological cancer or solid tumor cancer are available in tenth size.

PRODUCT

Custom Autoimmune and Inflammatory Diseased Products

https://www.stemcell.com/autoimmune-products

RESOURCE

Cancer Blood Products

https://www.stemcell.com/cancer-blood-products.html

*Certain fresh or cryopreserved products are only available in select territories. Please contact your Sales representative or Product and Scientific Support (techsupport@stemcell.com) for further information.

Diseased Human Peripheral Blood Leukopaks, Fresh or Frozen[1,2,3]

Solid Tumor Cancer	Hematological Cancer	Autoimmune and Inflammatory Diseases	
Bladder Cancer	Acute Lymphoblastic Leukemia (ALL)	Amyotrophic Lateral Sclerosis (ALS)	Irritable Bowel Syndrome
Breast Cancer	Acute Myeloid Leukemia (AML)	Ankylosing Spondylitis	Lupus
Cervical Cancer	Chronic Lymphocytic Leukemia (CLL)	Autoimmune Hepatitis	Multiple Sclerosis
Colorectal Cancer	Chronic Myelogenous Leukemia (CML)	Celiac Disease	Myasthenia Gravis
Endometrial Cancer	Diffuse Large B Cell Lymphoma (DLBCL)	Crohn's Disease	Osteoarthritis
Esophageal Cancer	Follicular Lymphoma (FL)	COPD	Psoriasis
Gastric Cancer	Mantle Cell Lymphoma (MCL)	Diabetes, Type I	Rheumatoid Arthritis
Head and Neck Cancer	Multiple Myeloma (MM)	Diabetes, Type II	Scleroderma
Kidney Cancer	Myelofibrosis (MF)	Graves' Disease	Sjogren's Syndrome
Liver Cancer		Hashimoto's Disease	Type 1 Interferonopathy
Lung Cancer		Hidradenitis Suppurativa	Ulcerative Colitis
Melanoma		Inflammatory Myopathy	Vasculitis
Ovarian Cancer			Other Non-Cancer Disease
Pancreatic Cancer			
Prostate Cancer			
Any Solid Tumor Cancer			

1. *High-resolution HLA typing, CMV status, and donor disease and treatment information ,including current medications, date of diagnosis, disease score, and treatment history, may be available upon request.*
2. *Product options, including fresh whole blood, fresh leukopaks, frozen leukopaks, frozen PBMCs, and frozen plasma, are only available for certain diseases and in select territories. Please contact Product and Scientific Support (**techsupport@stemcell.com**) for further information.*
3. *Diseased fresh leukopaks from donors diagnosed with a specific solid tumor or hematological cancer are available in tenth sizes (minimum cell count: ≥ 1 billion), and from patients diagnosed with autoimmune or inflammatory diseases are available in full (minimum cell count: ≥ 8 billion) and half (minimum cell count: ≥ 4 billion) sizes.*

*Certain fresh or cryopreserved products are only available in select territories. Please contact your Sales representative or Product and Scientific Support (**techsupport@stemcell.com**) for further information.

Mobilized Leukopaks, Fresh*

Mobilized leukopaks are peripheral blood leukopaks mobilized with G-CSF (Filgrastim or NEUPOGEN®), plerixafor (Mozobil®), or a combination of both, containing large numbers of single-donor CD34+ hematopoietic stem and progenitor cells (HSPCs). As a rich source of circulating CD34+ cells from a single-donor, mobilized leukopaks can help you minimize donor-to-donor single-cell variability, ensuring consistency across your experiments and allowing scalability of your stem cell studies.

Mobilizing Agent	Mobilizing Regimen	Mobilization and Collection Schedule						Quantity	Apheresis	Catalog #
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6			
Granulocyte Colony-Stimulating Factor (G-CSF)	5-Day					First Collection	Second Collection	1 Bag	First Collection (Day 5)	200-0602
									Second Collection (Day 6)	200-0603
								2 Bags	Both Collections (Day 5 and 6)	100-1101 (200-0602 & 200-0603)
Plerixafor	1-Day	First Collection						1 Bag	First Collection	200-0604
G-CSF + Plerixafor (Combo)	5-Day					First Collection	Second Collection	1 Bag	First Collection (Day 5)	200-0607
									Second Collection (Day 6)	200-0608
								2 Bags	Both Collections (Day 5 and 6)	100-1103 (200-0607 & 200-0608)

Figure 4. Mobilization Regimens of Leukopaks Mobilized with G-CSF, Plerixafor, or a Combination of G-CSF and Plerixafor (Combo)

Normal donors are mobilized with specified doses of granulocyte colony-stimulating factor (G-CSF), plerixafor, or a combination of both mobilizing agents prior to collection. For G-CSF and combo regimens, first collection only, second collection only, and both collections (first and second) are available as product options. All mobilized leukopak products are shipped with a Certificate of Analysis (CoA) containing the reported total nucleated cells, viability, CD34+ cell frequency, standard donor information, HLA results, and full flow cytometry panel showing viable cells, CD34+ cells, monocytes, B cells, NK cells, and CD4+ and CD8+ T cell populations. Mobilized leukopaks do not have a minimum cell count specification as the cell count can vary greatly due to donor variability and the mobilizing agent. On average, the cell count for a mobilized leukopak could be 2 - 6 times more than a normal fresh leukopak based on the donor and mobilizing agent.

For a complete listing of primary cell products, including mobilized peripheral blood, cord blood, bone marrow product, and cultured cells, as well as workflow solutions for cell-based assays, please visit: www.stemcell.com/primarycells.

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Easy 250 EasySep™ Magnet

Scale up your manual cell isolations and obtain cells from large-volume samples such as leukopaks with the Easy 250 EasySep™ Magnet. Rather than splitting your cell suspension and performing multiple rounds of isolations, with the Easy 250 EasySep™ Magnet you can process up to 225 mL and 12.5 x 10^9 cells in a single isolation step in as little as 20 minutes. Use this magnet with a standard T-75 cell culture flask and EasySep™ reagents to speed up cell isolation from large-volume samples such as full-size leukopaks and whole blood. The isolated cells are immediately ready for downstream applications.

Obtain purities of up to 99% for human cell types isolated from large sample volumes, including:

- T cells and T cell subsets
- B cells
- Monocytes
- Natural killer cells
- Peripheral blood mononuclear cells
- And more!

Figure 5. Easy 250 EasySep™ Magnet

In as little as 20 minutes, process up to 225 mL of sample and 1.25 x 10^{10} cells, with a single isolation step, using the Easy 250 EasySep™ Magnet.

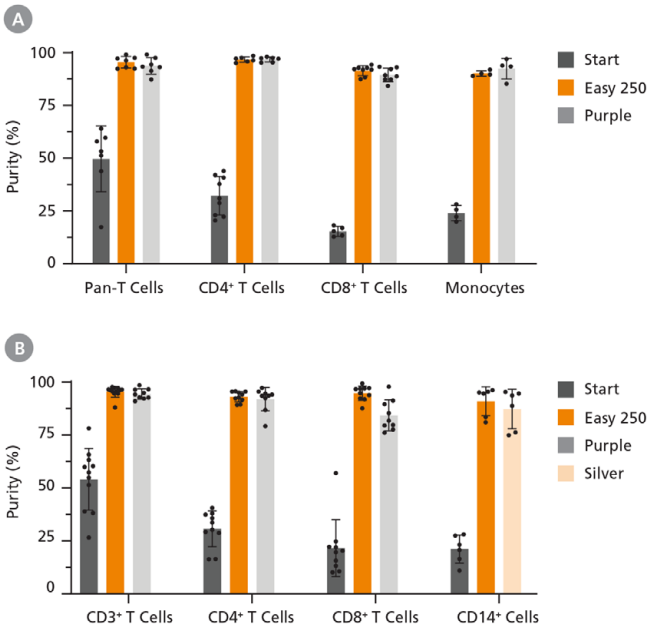

Figure 6. Using the Easy 250 EasySep™ Magnet Results in Highly Purified Cells of Interest

Human immune cells were isolated from processed leukopaks using the corresponding (A) EasySep™ negative selection kits or (B) EasySep™ positive selection kit. Cell purity was measured before isolation (Start) and after isolation with the Easy 250 EasySep™ Magnet (Easy 250), EasySep™ Magnet (Purple), or "The Big Easy" EasySep™ Magnet (Silver). Purity was assessed by staining with cell surface markers for pan-T cells (CD3+), CD4+ T cells (CD3+CD4+), CD8+ T cells (CD3+CD8+), or monocytes (CD14+CD45+), and analyzed by flow cytometry. Data shown as mean ± SD; n = 4 - 12.

PRODUCT

Request a Free Demonstration

https://www.stemcell.com/forms/demo-easy250.html

Products for Cell Isolation from Large-Volume Samples

Product Name	Catalog #
Easy 250 EasySep™ Magnet	100-0821
EasySep™ Human T Cell Isolation Kit	100-0695
EasySep™ Human CD3 Positive Selection Kit II	100-0692
EasySep™ Human CD4+ T Cell Isolation	100-0696
EasySep™ Human CD4 Positive Selection Kit II	100-0693
EasySep™ Human CD8+ T Cell Isolation Kit	100-0710
EasySep™ Human CD8 Positive Selection Kit II	100-0699
EasySep™ Human CD4+CD127lowCD25+ Regulatory T Cell Isolation Kit	100-1136
EasySep™ Human TCR Alpha/Beta Depletion Kit	100-1660
EasySep™ Human Monocyte Isolation Kit	100-0697
EasySep™ Human Monocyte Isolation Kit	100-0697
EasySep™ Human CD14 Positive Selection Kit II	100-0694
EasySep™ Direct Human PBMC Isolation Kit	19654
EasySep™ RBC Depletion Reagent	18170
EasySep™ Human NK Cell Isolation Kit	100-0960
EasySep™ Human B Cell Isolation Kit	100-0971
EasySep™ Human CD34 Positive Selection Kit II	100-1569