



Miltenyi Biotec

StraightFrom[®] Technology

Cell isolation directly from blood products



StraightFrom
Technology



CELL CULTURE

FLOW CYTOMETRIC ANALYSES

FUNCTIONAL STUDIES





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MACS Technology

The success behind StraightFrom Technology

MACS MicroBead Technology is the most trusted and proven cell isolation technology that meets all your cell isolation needs. Pivotal to this technology are our patented MACS Columns. Steel spheres inside the column matrix amplify the magnetic field 10,000-fold. This allows for minimal labeling and the smallest bead size. Target cells are labeled with nano-sized MicroBeads (~50 nm) via antibodies and gently retained inside the column to optimize separation results and preserve full cell functionality.

- Minimal labeling and smallest bead size allow for preserved characteristics and no cell activation.
- No cell stress means highest viability and no effects on cell functionality.
- Cells can be directly used in downstream applications with free epitopes and no bead aggregates.

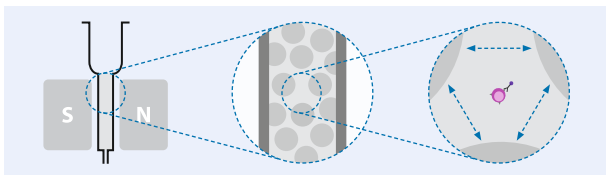


Figure 1: MACS Column at a glance. Cells move freely between the steel spheres inside the column and are only retained by magnetic forces. Spaces between the spheres are up to 20x the cells' size.

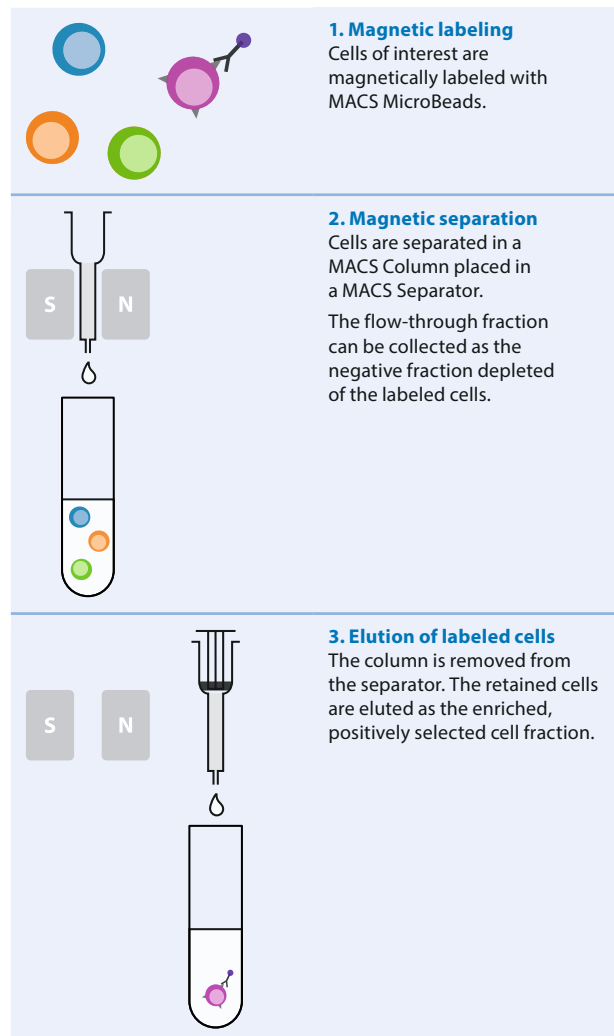


Figure 2: Three easy steps of MACS MicroBead Technology to isolate your cells of interest.

StraightFrom MicroBeads

Quick and easy cell isolation directly from blood

StraightFrom MicroBeads allow magnetic cell separation of various leukocyte subsets directly from different starting materials, such as whole blood, buffy coat, leukocyte reduction system chamber (LRSC), and Leukopak®. Leukocytes consist of peripheral blood mononuclear cells (PBMCs) and granulocytes.

Conventional protocols require isolation of PBMCs by density gradient centrifugation before target cell isolation. StraightFrom Technology omits this time-consuming step. Subsets are purified either automatically or manually using the appropriate magnetic separator and StraightFrom MicroBeads.

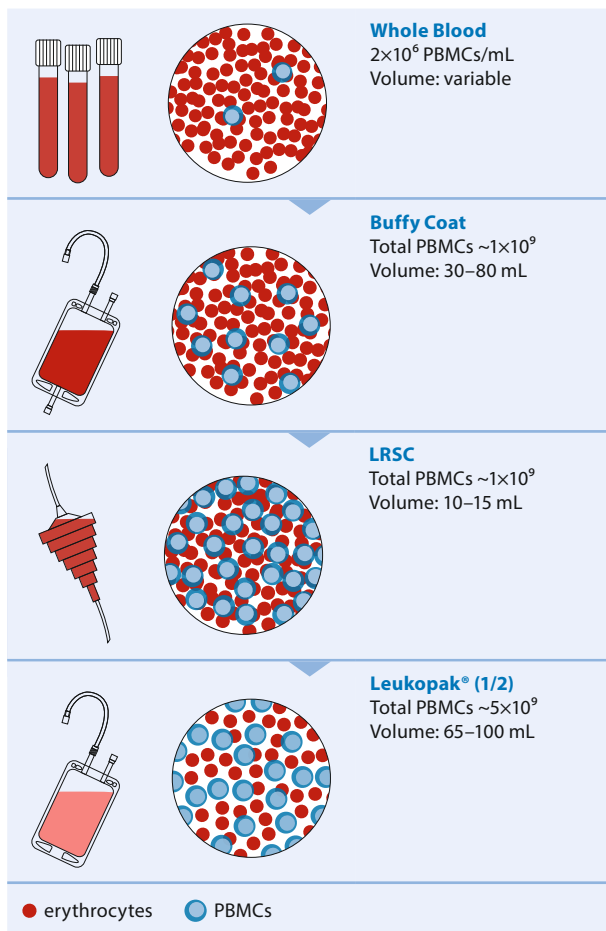


Figure 3: Starting materials used for PBMC isolation.

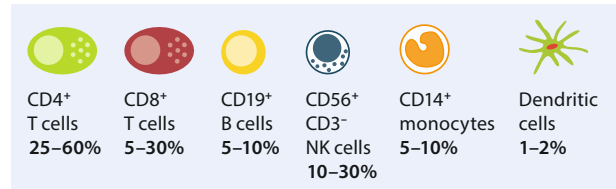


Figure 4: The PBMCs contain leukocyte subsets at different frequencies.

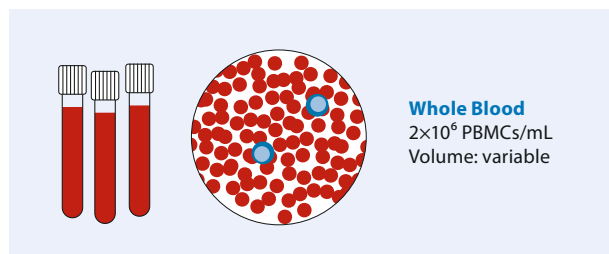
The isolated target cells are immediately ready for any cellular and molecular analysis. Depending on the starting material, volumes, and leukocyte concentrations are variable. To combat this, StraightFrom MicroBead Kits have been developed for each starting material to optimize cell separation results in terms of cell purity and recovery rates. With these kits, isolation of leukocyte subsets has never been easier and quicker compared to the conventional methods. Eliminating unnecessary steps during cell separation decreases user-dependent variability, leading to a reliable and standardized protocol.

- No density gradient centrifugation, erythrocyte lysis, or cell counting needed
- Fast cell isolation in less than 30 minutes
- Simple protocol with only a few handling steps

Conventional protocol	StraightFrom MicroBeads protocol	StraightFrom REAlease® MicroBeads protocol
Transfer and dilute sample	Transfer and dilute sample	Transfer and dilute sample
Layer density gradient medium	Magnetic labeling	Magnetic labeling
Density gradient centrifugation without brake	Cell separation	Cell separation with bead removal
PBMC separation and wash	<30 min	<40 min
Cell count		Optional label removal
Magnetic labeling		
Cell separation		
>90 min		

Figure 5: StraightFrom and StraightFrom REAlease MicroBeads protocol simplifies and notably shortens the isolation of target cells.

StraightFrom Whole Blood MicroBeads and Kits



Maximum yield from varying sample volumes

For numerous applications, leukocyte subsets need to be isolated from anticoagulated blood samples. Whole blood donations represent a readily available and versatile source material with well-defined cell numbers that come in different desired volumes. StraightFrom Whole Blood MicroBeads were designed to optimally fit this variability.

The MicroBeads are added directly to the whole blood sample without any prior cell counting or PBMC isolation. A variety of leukocyte subsets can be isolated directly within minutes.

- PBMCs are immediately ready for downstream applications
- Flexible sample volumes of 0.25–15 mL per column
- Manual to fully automated cell isolation

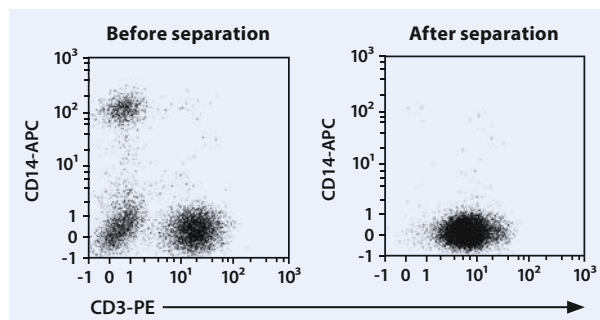
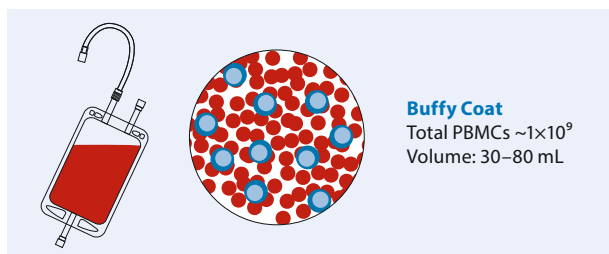


Figure 6: Separation of CD3⁺ cells from a whole blood sample using the StraightFrom Whole Blood CD3 MicroBeads, human.

StraightFrom Whole Blood MicroBeads and accessories

Product	Order no.
StraightFrom Whole Blood CD3 MicroBeads, human	130-090-874
StraightFrom Whole Blood CD4 MicroBeads, human	130-090-877
StraightFrom Whole Blood CD8 MicroBeads, human	130-090-878
StraightFrom Whole Blood CD14 MicroBeads, human	130-090-879
StraightFrom Whole Blood CD15 MicroBeads, human	130-091-058
StraightFrom Whole Blood CD19 MicroBeads, human	130-090-880
StraightFrom Whole Blood CD33 MicroBeads, human	130-094-773
StraightFrom Whole Blood CD45 MicroBeads, human	130-090-872
StraightFrom Whole Blood CD56 MicroBeads, human	130-090-875
StraightFrom Whole Blood CD66b MicroBeads, human	130-104-913
StraightFrom Whole Blood CD138 MicroBeads, human	130-093-062
StraightFrom Whole Blood and Bone Marrow CD138 MicroBeads, human	130-105-961
StraightFrom Whole Blood Anti-ROR1 MicroBead Kit, human	130-105-751
StraightFrom Whole Blood CD326 (EpCAM) MicroBeads, human for 40 mL whole blood	130-109-827
StraightFrom Whole Blood CD326 (EpCAM) MicroBeads, human for 200 mL whole blood	130-109-828
Whole Blood Column Kit	130-093-545

StraightFrom Buffy Coat MicroBead Kits



Accelerated buffy coat processing

StraightFrom Buffy Coat MicroBead Kits allow the fast and easy separation of leukocyte subsets directly from buffy coats. As by-products from whole blood donations being processed into erythrocyte concentrates or plasma products, buffy coats contain the same amount of leukocytes as the original whole blood donation, but in higher concentrations. These kits are perfectly suited to process an entire buffy coat for target cells in less than 30 minutes.

- Process an entire buffy coat in a single run in less than 30 min
- Ready-to-use kits include MicroBeads, Whole Blood Columns, and elution buffer
- Manual or automated processing with the QuadroMACS™ Separator or the MultiMACS™ Cell Separator family.

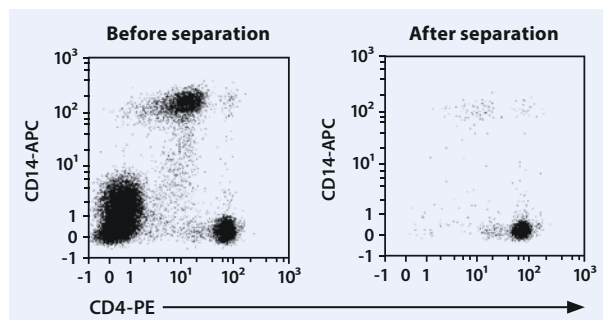
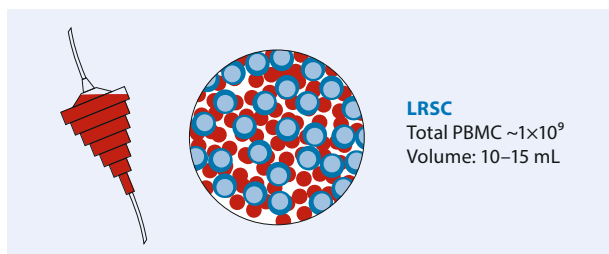


Figure 7: Separation of CD4⁺ cells from a buffy coat sample using the StraightFrom Buffy Coat CD4 MicroBead Kit and the MultiMACS Cell24 Separator Plus.

StraightFrom Buffy Coat MicroBead Kits

Product	Order no.
StraightFrom Buffy Coat CD3 MicroBead Kit, human	130-121-310
StraightFrom Buffy Coat CD4 MicroBead Kit, human	130-114-980
StraightFrom Buffy Coat CD8 MicroBead Kit, human	130-114-978
StraightFrom Buffy Coat CD4/CD8 MicroBead Kit, human	130-121-312
StraightFrom Buffy Coat CD14 MicroBead Kit, human	130-114-976
StraightFrom Buffy Coat CD19 MicroBead Kit, human	130-114-974
StraightFrom Buffy Coat CD56 MicroBead Kit, human	130-114-963

StraightFrom LRSC MicroBead Kits



Streamlining cell separation from LRSC

LRSCs (Leukocyte Reduction System Chambers), also known as buffy cones, are used in routine plateletpheresis procedures for depletion of unwanted leukocytes. As LRSCs contain highly concentrated leukocytes in a relatively small volume, they are an ideal starting material.

StraightFrom LRSC MicroBead Kits enable the separation of various leukocyte subsets directly from LRSCs via manual or automated cell separation.

- Processing of an entire LRSC in a single run
- Ready-to-use kits include MicroBeads, LS Columns, and elution buffer
- Manual or automated processing with the QuadroMACS Separator or the MultiMACS Cell Separator family.

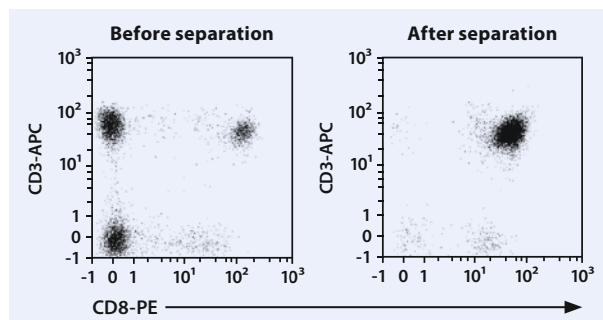
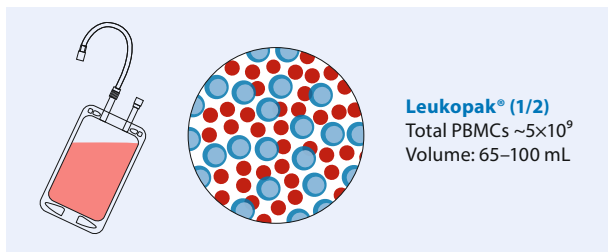


Figure 8: Separation of CD8⁺ cells from a LRSC sample using the StraightFrom LRSC CD8 MicroBead Kit and the MultiMACS Cell24 Separator Plus.

StraightFrom LRSC MicroBead Kits

Product	Order no.
StraightFrom LRSC CD3 MicroBead Kit, human	130-121-309
StraightFrom LRSC CD4 MicroBead Kit, human	130-117-028
StraightFrom LRSC CD8 MicroBead Kit, human	130-117-027
StraightFrom LRSC CD4/CD8 MicroBead Kit, human	130-121-307
StraightFrom LRSC CD14 MicroBead Kit, human	130-117-026
StraightFrom LRSC CD19 MicroBead Kit, human	130-117-025
StraightFrom LRSC CD56 MicroBead Kit, human	130-117-024

StraightFrom Leukopak® MicroBead Kits



Convenient processing in a single run

During leukapheresis, white blood cells are separated from donor blood and collected as highly concentrated leukocytes in a Leukopak®. Therefore, they are ideal for the isolation of large numbers of various leukocyte subsets via automated magnetic cell separation using the StraightFrom Leukopak® MicroBead Kits and the MultiMACS Cell Separator Family.

- Processing of a 1/2 bag Leukopak® in a single run
- Ready-to-use kits include MicroBeads, Multi-24 Column Block, and elution buffer
- Manual or automated processing with the QuadroMACS Separator or the MultiMACS Cell Separator family.

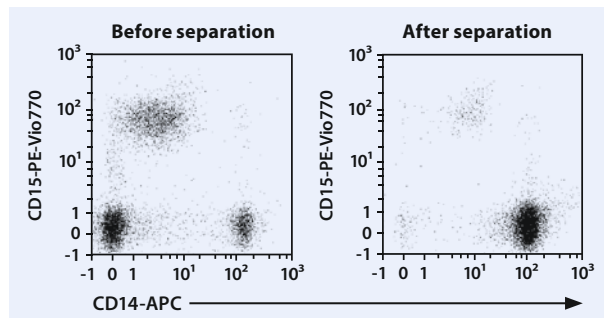


Figure 9: Separation of CD14⁺ cells from a Leukopak® sample using the StraightFrom Leukopak® CD14 MicroBead Kit and the MultiMACS Cell24 Separator Plus.

StraightFrom Leukopak® MicroBead Kits

Product	Order no.
StraightFrom Leukopak CD3 MicroBead Kit, human	130-122-365
StraightFrom Leukopak CD4 MicroBead Kit, human	130-117-022
StraightFrom Leukopak CD8 MicroBead Kit, human	130-117-019
StraightFrom Leukopak CD4/CD8 MicroBead Kit, human	130-122-352
StraightFrom Leukopak CD14 MicroBead Kit, human	130-117-020
StraightFrom Leukopak CD19 MicroBead Kit, human	130-117-021

Automatic and manual cell isolation strategies

The right fit for your lab

Manual MACS Cell Separators

Ease-of-use with manual MACS Separators for simple and straightforward setups in any lab.

- An ideal solution for low-throughput experiments
- Cited in over 30,000 publications
- Perfectly tailored solutions for your experimental needs








autoMACS® Pro Separator

Fully automated benchtop instrument for magnetic cell separation of target cells from blood materials for further downstream applications or analyses.

- Cell labeling and isolation of up to six samples with walk-away convenience
- Standardized cell separation for reproducible, user-independent results
- Easy-to-use software interface for a multi-user environment



StraightFrom Technology and related MACS Separators

	StraightFrom Whole Blood	StraightFrom Buffy Coat	StraightFrom LRSC	StraightFrom Leukopak®	StraightFrom REAlease Buffy Coat MicroBead Kits
Capacity per kit	 Up to 40 mL whole blood	 1 buffy coat	 1 LRSC	 1/2 Leukopak®	 1 buffy coat
Kit components	StraightFrom Whole Blood MicroBeads	StraightFrom Buffy Coat MicroBeads, Whole Blood Column Elution Buffer, Whole Blood Columns	StraightFrom LRSC MicroBeads, Whole Blood Column Elution Buffer, LS Columns	StraightFrom Leukopak® MicroBeads, Whole Blood Column Elution Buffer, Multi-24 Column Block	StraightFrom Buffy Coat REAlease MicroBeads, REAlease Bead Release Reagent, REAlease Release Reagent, REAlease Stop Reagent, Whole Blood Columns
Separators	MidiMACS™, QuadroMACS, autoMACS Pro, MultiMACS Cell Separator Family	QuadroMACS, MultiMACS Cell Separator Family	QuadroMACS, MultiMACS Cell Separator Family	MultiMACS Cell Separator Family	MidiMACS, QuadroMACS, MultiMACS Cell Separator Family

MultiMACS Cell24 Separator Plus

Efficient, semi-automated benchtop instrument for cell isolation of large sample volumes or numbers to meet scalability and throughput challenges.

- Convenient and easy handling of up to 24 samples in parallel
- Compatible with any cell separation strategy and starting material, especially blood materials
- Reliable, standardized process for reproducible results



MultiMACS X

Completely automated cell isolation instrument for demanding high-throughput applications enables fast parallel separation of up to 24 samples.

- Based on the MultiMACS Cell24 Separator Plus technology for minimal hands-on time
- Custom-designed liquid handler for your specific application
- Compatible with laboratory information management systems to document samples and runs



MACS Cell Separators and consumables

Products	Order no.
Manual MACS Cell Separators	
Whole Blood QuadroMACS Starting Kit	130-098-242
Whole Blood MidiMACS Starting Kit	130-098-240
autoMACS Pro Separator	
autoMACS Pro Separator - Starter Kit	130-092-545
autoMACS Columns	130-050-401
MultiMACS Cell24 Separator Plus	
MultiMACS Cell24 Separator Plus	130-098-637
Single-well Deep Well Plates	130-114-966
Single-well Deep Well Plates X	130-120-006
2-well Deep Well Plates	130-120-010
3-well Deep Well Plates	130-120-009
4-well Deep Well Plates	130-120-008
24-well Deep Well Plates	130-110-500
Deep Well Plate Lids	130-120-007
MultiMACS X	
MultiMACS X	130-118-515

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