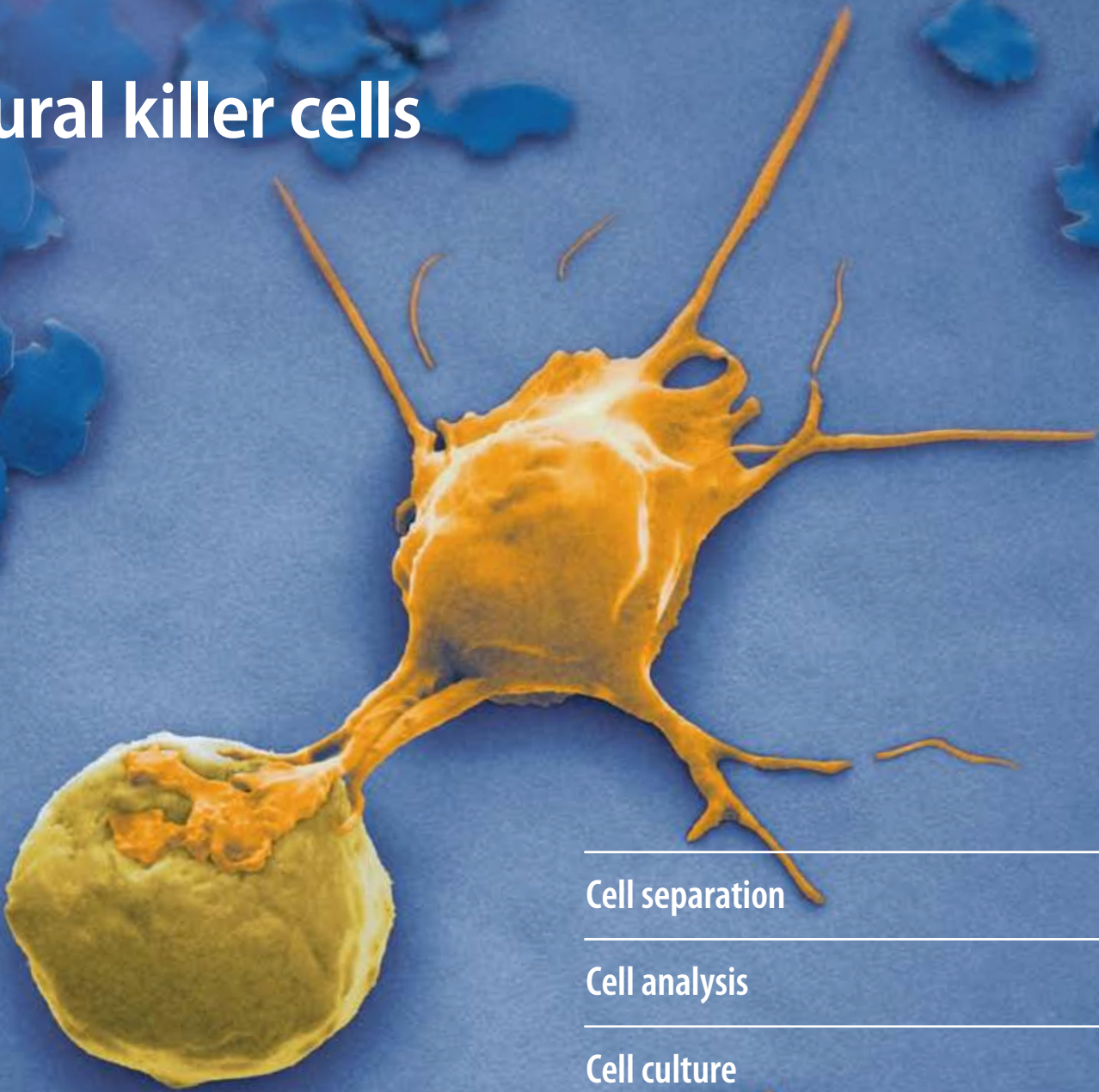




Miltenyi Biotec

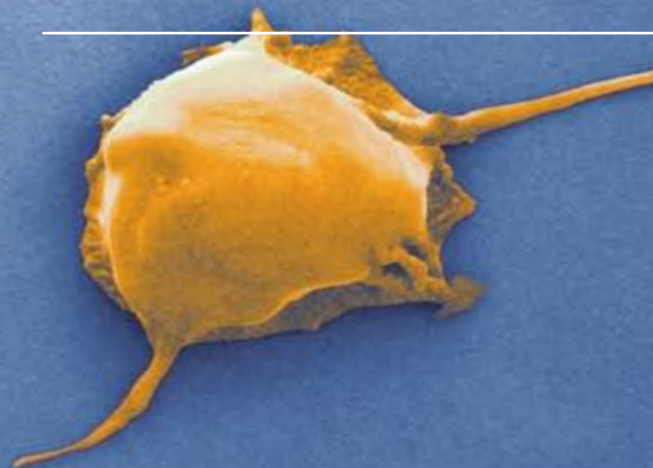
Natural killer cells



Cell separation

Cell analysis

Cell culture



MACS Technology by Miltenyi Biotec

Providing a firm foundation for reliable results

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More than 14,500 studies used Miltenyi Biotec products

Tried and tested by researchers worldwide

MACS® Technology is the recognized standard in cell separation. More than 14,500 publications have proven its versatility for many applications in both basic research and clinical arenas. Rare cells, abundant cells, or sophisticated cell subsets can be easily and reliably sorted using MACS Technology.

About MACS MicroBeads

MACS MicroBeads are superparamagnetic particles of approximately 50 nanometers in diameter. They are composed of a biodegradable matrix, and it is therefore not necessary to remove them from cells after the separation process.

- Specific monoclonal antibody conjugates
- Colloidal, for easy handling and short incubation times
- Small (50 nm), non-toxic, biodegradable
- Detachment is not required for downstream experiments

MACS MicroBeads do not alter the structure, function, or activation status of labeled cells and are not known to interfere with subsequent experiments. For references that demonstrate the unique advantages of MACS Technology, e-mail: macstec@miltenyibiotec.de.

Benefit from MACS Technology

- Optimal recovery and excellent purity
- Easy separation of large cell numbers or rare cells
- Fast, convenient, and absolutely reliable
- Gentle to cells
- Automated cell separation with the autoMACS® Pro Separator
- Compatible with flow cytometry
- Bridges basic research and clinical applications

Sorting out a cell separation strategy

Choosing the optimal cell separation method

Positive selection

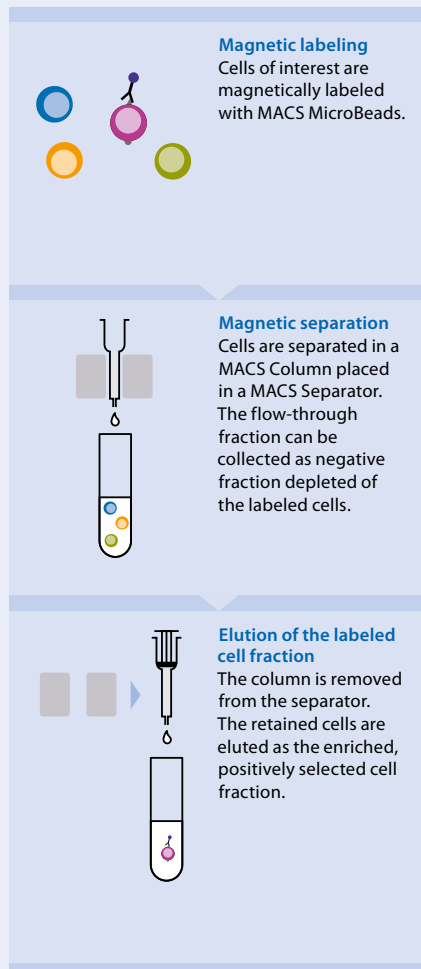


Figure 1: Positive selection means that the desired target cells are magnetically labeled and isolated as the magnetically retained cell fraction.

Positive selection is the most direct and specific way to isolate the target cells from a heterogeneous cell suspension. Binding of MicroBeads to the cell surface does not affect viability or function of the cells. Both fractions, labeled and unlabeled, can be recovered and used.

Untouched isolation

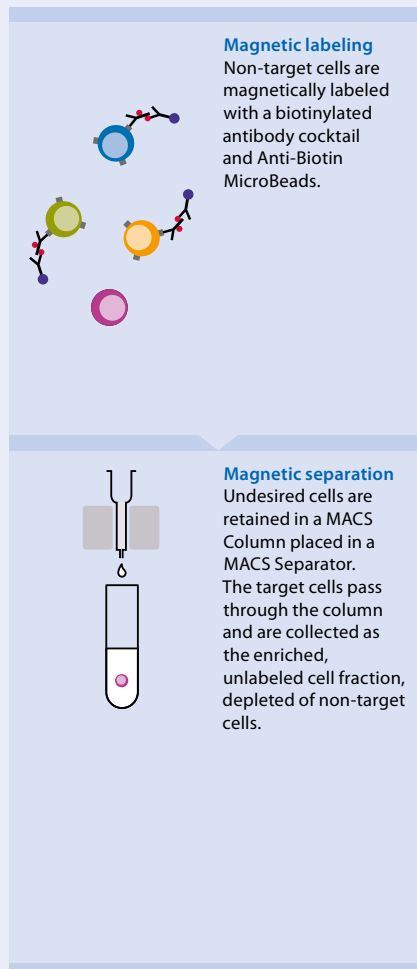


Figure 2: Untouched isolation is performed by depletion of undesired cells. Non-target cells are magnetically labeled and eliminated from the cell mixture. The non-magnetically labeled, untouched cell fraction contains the target cells.

For many different cell types, Miltenyi Biotec offers optimized MACS Cell Isolation Kits containing pre-titrated cocktails of antibodies directed against non-target cells.

Sequential sorting: Depletion followed by positive selection

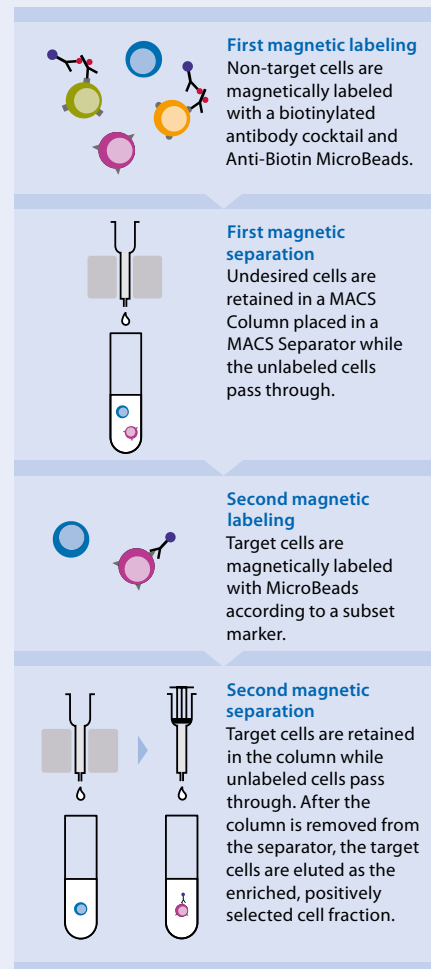


Figure 3: Cell subsets can be isolated by first depleting the non-target cells and then positively selecting the cell subsets of interest.

This strategy is useful if undesired cells in the cell suspension express the same antigen that is used for positive selection of the target cells.

Uncompromising in purity and performance

Separation of human NK cells and NK cell subsets

MACS Products for the isolation of human and non-human primate NK cells

Product	Separation strategy
NK Cell Isolation Kit	Untouched isolation
CD56 MicroBeads	Positive selection of NK and NKT-like cells
CD56 MultiSort Kit	Sequential sorting of NK cell subsets
Whole Blood CD56 MicroBeads	Positive selection of NK cells from human whole blood
CD57 MicroBeads	Positive selection or depletion of CD57 ⁺ cells
CD16 MicroBeads, non-human primate	Positive selection or depletion of CD16 ⁺ NK cells from rhesus monkey

Table 1: Representative MACS Products for the isolation of human and non-human primate NK cells. Refer to page 10 for a complete product list.

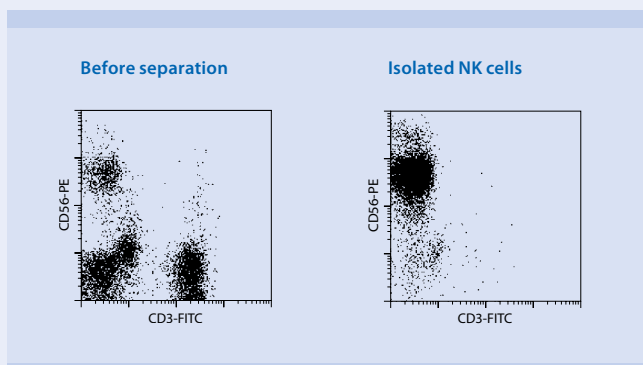


Figure 4: Isolation of untouched NK cells from human PBMCs using the NK Cell Isolation Kit. Cells were stained with CD56-PE and CD3-FITC and analyzed by flow cytometry.

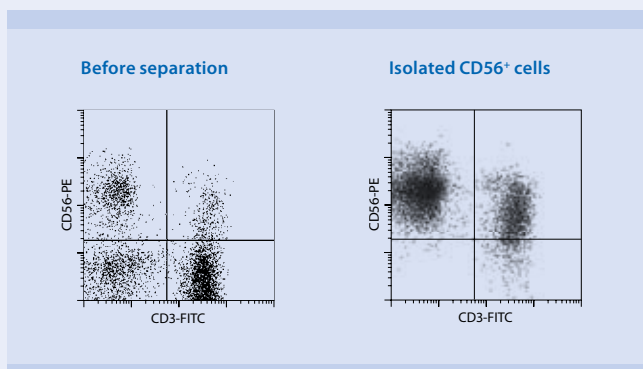


Figure 5: Isolation of CD56⁺ cells from human PBMCs using CD56 MicroBeads. Cells were stained with CD56-PE and CD3-FITC and analyzed by flow cytometry.

Isolate human NK cells with high yield and purity

Natural killer (NK) cells are a subset of lymphocytes principally involved in innate immunity. They also participate in the adaptive immune response.

Miltenyi Biotec offers outstanding products for the:

- isolation of untouched NK cells from whole blood or PBMCs.
- concurrent selection or depletion of NK cells and NKT cells using CD56 MicroBeads.

Results that speak for themselves

The NK Cell Isolation Kit is an indirect labeling system for the isolation of untouched NK cells from human PBMCs. It has supported many scientific publications including investigations that addressed:

- the role of several cytokines in mediating NK cell repertoire¹.
- a novel NK cell subset that may play an immune suppressor or regulatory role².
- NK cell activation in response to *Plasmodium* infection³.

CD56 MicroBeads were used to:

- investigate the cytolytic action of NK cells on regulatory T cells expanded in response to bacterial antigen⁴.
- the antibody-dependent cellular cytotoxicity activity of cetuximab against lung cancer cell lines⁵.
- identify and characterize a novel NK cell subset, namely, NK-22 cells⁶.

CD56 Whole Blood MicroBeads were used with autoMACS[®] Separators to automatically enrich NK cells:

- for chimerism analysis after allogeneic hematopoietic stem cell transplantation⁷.
- to evaluate the performance of automated MACS[®] Separations for chimerism analysis—the authors report excellent purity and recovery⁸.

Isolate human NK cell subsets in only two steps

The developmental mechanisms governing the diversity of human NK cell subsets remain largely unknown. To support NK subset research, several kits have been developed for isolation of specific NK subsets in only two steps:

1. First, all non-NK cells are depleted from the sample using a cocktail of biotinylated antibodies and Anti-Biotin MicroBeads.
2. Second, the target NK cell population is magnetically labeled using subset-specific antigens and purified by positive selection.

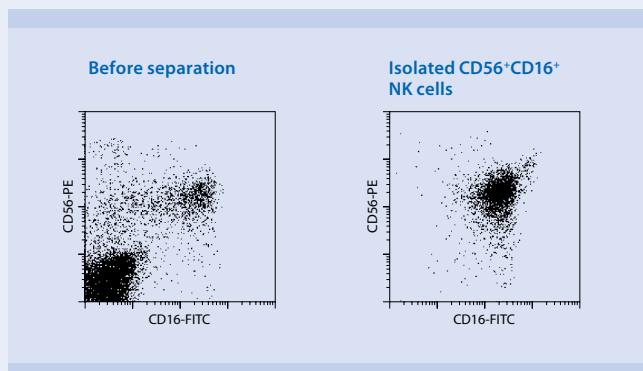


Figure 6: CD56⁺CD16⁺ NK cells were isolated from human PBMCs using the CD56⁺CD16⁺ NK Cell Isolation Kit. CD56^{dim} NK cells also express CD16 and killer immunoglobulin-like receptors (KIRs). This subset is known to be highly cytotoxic. Cells were stained with CD16-FITC and CD56-PE and analyzed by flow cytometry.

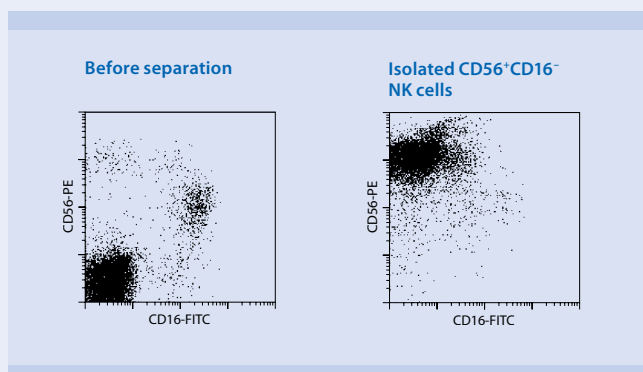


Figure 7: CD56⁺CD16⁻ NK cells were isolated from human PBMCs using the CD56⁺CD16⁻ NK Cell Isolation Kit. CD56^{bright} NK cells are described to have an immunoregulatory role due to their high capacity for cytokine production. Cells were stained with CD16-FITC and CD56-PE and analyzed by flow cytometry.

MACS Products for the isolation of human NK cell subsets

Product	Separation strategy
CD56 ⁺ CD16 ⁺ NK Cell Isolation Kit	Isolation of human CD56 ^{dim} CD16 ⁺ NK cells
CD56 ⁺ CD16 ⁻ NK Cell Isolation Kit	Isolation of human CD56 ^{bright} CD16 ⁻ NK cells
Anti-iNKT MicroBeads	Enrichment or depletion of human iNKT cells expressing TCR Va24-Ja18 combined with Vβ11

Table 2: Representative MACS Products for the isolation of human NK cell subsets. Refer to page 10 for a complete product list.

Isolate invariant NKT (iNKT) cells with ease

Anti-iNKT MicroBeads have been developed for the separation of human invariant natural killer T cells (iNKT cells). This cell type is characterized by expression of an invariant T cell receptor α -chain and certain TCR β -chains (Va24-Ja18 combined with V β 11). iNKT cells represent a distinct lymphocyte population that co-expresses T cell and NK cell surface markers. iNKT cells are involved in immunoregulatory processes such as tolerance, host defense, and tumor surveillance.

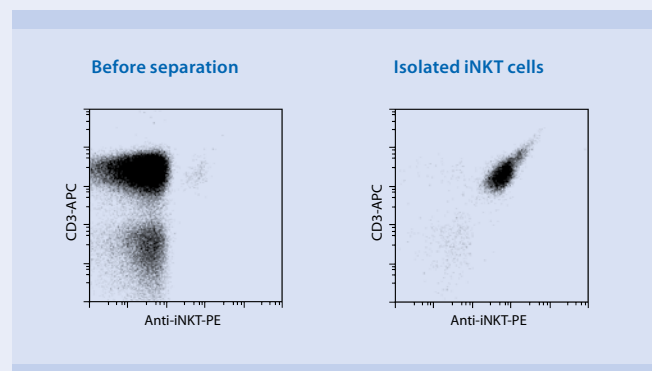


Figure 8: iNKT cells were isolated from human PBMCs using Anti-iNKT MicroBeads. Cells were fluorescently stained with Anti-iNKT-PE, CD3-APC, and CD45-FITC and analysed by flow cytometry using the MACSQuant[®] Analyzer. Gating was performed according to CD45-expression and side scatter properties of the cells.

Maximum flexibility in cell separation

Separation of mouse NK cells, or indeed any cell, from any species

Efficiently isolate mouse NK cells

Miltenyi Biotec has developed products for rapid isolation of mouse NK cells:

- **CD49b (DX5) MicroBeads**—CD49b can be used for the isolation of NK cells from several inbred mouse strains.
- **NK Cell Isolation Kit, mouse** is a straightforward tool for the isolation of untouched NK cells.
- **Anti-NKp46 MicroBead Kit** was developed for the isolation of NK cells from the vast majority of inbred mouse strains.

Product performance you can rely on

Cells isolated by CD49b (DX5) MicroBeads were adoptively transferred into mice to investigate:

- the role of NK cells in the modulation of T_H1 responses⁹.
- the anti-multiple myeloma activity of NK cells via adoptive transfer and retroviral transduction of cells separated with DX5¹⁰.

The NK Cell Isolation Kit, mouse was used for studies on:

- NK cell toxicity in a mouse model of acute myeloid leukemia¹¹.
- the NK cell-mediated activation of cytotoxic T cells¹².
- the response of IL-15-independent NK cells to cytomegalovirus infection¹³.
- elucidating a novel non-secretory DC-NK-cell crosstalk mechanism¹⁴.

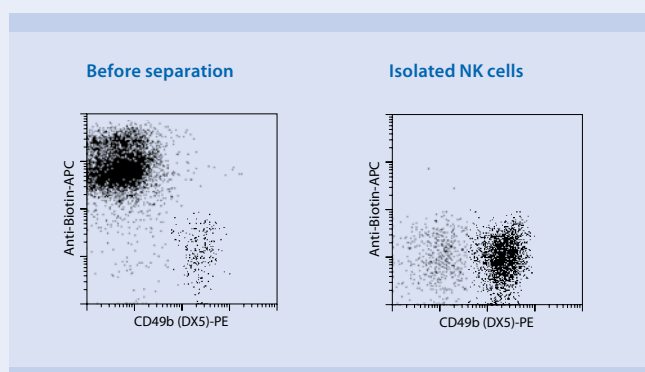


Figure 9: Isolation of untouched NK cells from a mouse spleen cell suspension using the NK Cell Isolation Kit. Cells were stained with CD49b(DX5)-PE and Anti-Biotin-APC and analyzed by flow cytometry.

MACS Products for the isolation of mouse NK cells

Product	Separation strategy
NK Cell Isolation Kit, mouse	Untouched isolation
CD49b (DX5) MicroBeads, mouse	Positive selection
Anti-NKp46 MicroBead Kit, mouse	Positive selection

Table 3: Representative MACS Products for the isolation of mouse NK cells.

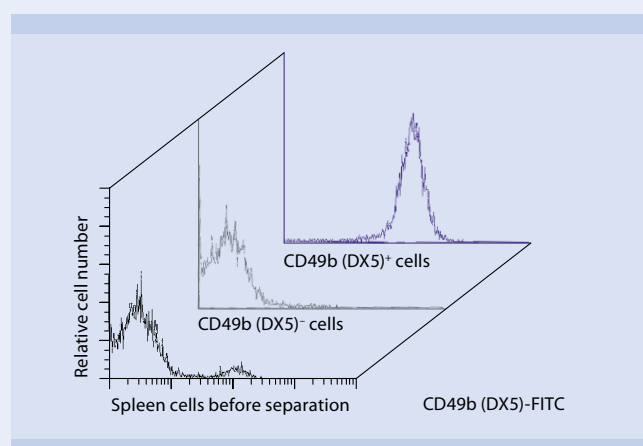


Figure 10: NK cells were isolated from a mouse spleen cell suspension using CD49b (DX5) MicroBeads. Cells were stained with CD49b (DX5)-FITC and analyzed by flow cytometry.

Target any cell type from any species

For maximum flexibility, indirect magnetic labeling with MACS MicroBeads allow the use of any primary antibody for cell isolation. Monoclonal or polyclonal primary antibodies of choice can be either unconjugated, biotinylated, or fluorochrome-conjugated.

Refer to page 10 for a complete product list.

Brighten your research

MACS® Products for NK cell analysis

KIR typing—From phenotype to genotype

It's widely acknowledged that a given cell genotype may not necessarily be reflected in the phenotype. This is often the case with killer cell immunoglobulin-like receptors (KIRs); a family of receptors that recognize HLA I molecules on target cells.

Miltenyi Biotec offers a broad panel of KIR-specific antibodies for KIR phenotyping. To complement this, the KIR Typing Kit for the detection of human KIR genes at the genomic DNA or mRNA level is also available.

The KIR Typing Kit was used for studies on, for example:

- KIR profiling, immune reconstitution, and clinical response after haploidentical stem cell transplantation, implication of KIR-HLA mismatch¹⁵.
- humanized mouse models for patient-tailored treatment strategies—NK cells which lack surface expression of inhibitory KIR although intracellular mRNA is present (cDNA)¹⁶.
- the role of KIR genotype in susceptibility to infectious disease —outcome of ebola virus infection is associated with an activating KIR profile¹⁷.



Figure 11: The KIR Typing Kit allows the detection of all known human KIR genes and alleles at the genomic DNA and mRNA level.

MACS® Antibodies for NK cell phenotyping

An ever expanding panel of fluorochrome-conjugated antibodies facilitates effective multiparameter cell analysis by flow cytometry. For example, antibody conjugates such as VioBlue® and PerCP have been introduced for optimal use with the MACSQuant® Analyzer.

Selected antibodies for NK cell analysis

Product (human)	Clone, isotype
Anti-KIR2D-PE, -APC, -Biotin, pure	NKVFS1, mouse IgG1
Anti-NKp80-FITC, -PE, -APC, -Biotin, pure	4A4.D10, mouse IgG1
CD3-FITC, -PE, -APC, -VioBlue, -PerCP	BW264/56, mouse IgG2a
CD8-FITC, -PE, -APC, -VioBlue, -PerCP	BW135/80, mouse IgG2a
CD16-FITC, -PE, -APC	VEP13, mouse IgM
CD56-PE, -APC, -Biotin	AF12-7H3, mouse IgG1
CD158a/h (KIR2DL1/DS1)-FITC, -PE, -APC, -VioBlue, -Biotin, pure	11PB6, mouse IgG1
CD158b (KIR2DL2)-PE, -APC, -PerCP, pure	DX27, mouse IgG2a
CD158e (KIR3DL1)-FITC, -PE, -APC, -Biotin, -VioBlue, -PerCP, pure	DX9, mouse IgG1
CD158e/k (KIR3DL1/DL2)-PE, -Biotin, pure	5.133, mouse IgG1
CD158f (KIR2DL5)-PE, pure	UP-R1, mouse IgG1
CD158i (KIR2DS4)-PE, -APC, -Biotin, pure	JJC11.6, mouse IgG1
CD335 (NKp46)-PE, -APC, pure	9E2, mouse IgG1
CD336 (NKp44)-PE, -APC, -Biotin, pure	2.29, mouse IgG1
CD337 (NKp30)-PE, -APC, -Biotin, pure	AF29-45D12, mouse IgG1
Product (mouse)	Clone, isotype
Anti-NK1.1-PE, -APC, -Biotin	PK136, mouse IgG2a
Anti-NKp46-FITC, -PE, -APC, -Biotin, pure	29A1.4, rat IgG2a
CD49b (DX5)-FITC, -PE, -APC	DX5, rat IgM

Table 4: Representative MACS fluorochrome-conjugated antibodies for cell analysis.

Refer to pages 10 to 12 for a complete product list.

Culture conditions for reproducible results

Products for NK cell stimulation, expansion, and culture

Efficient expansion of NK cells

The reliable and reproducible activation/expansion of NK cells is a clear requirement for effective downstream experiments. To meet this demand, Miltenyi Biotec offers a unique kit for the easy and efficient activation/expansion of NK cells.

Perform NK cell expansion using the NK Cell Activation/Expansion Kit:

1. Incubate PBMCs or isolated NK cells with innovative MACSiBead™ Particles pre-loaded with antibodies against CD2 and CD335 (NKp46).
2. Allow the cells to expand in culture and obtain reliable results in 2–3 weeks to receive functional NK cells.

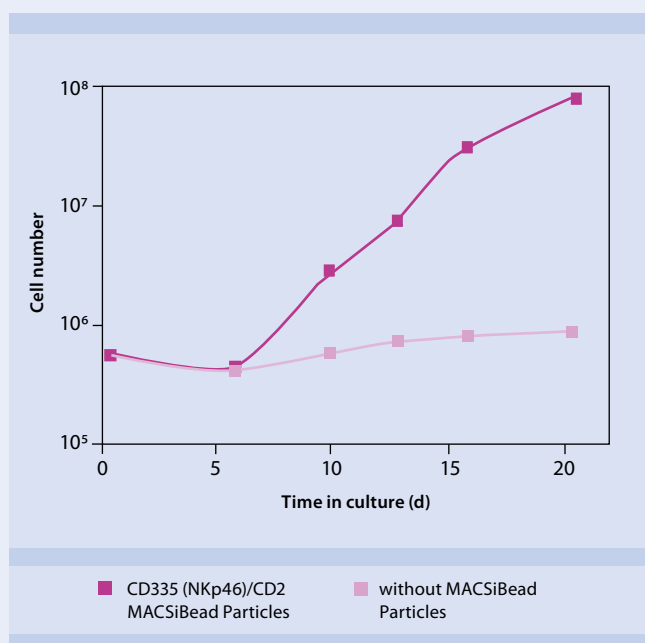


Figure 12: Kinetics of NK cell expansion. Anti-Biotin MACSiBead Particles were loaded with biotinylated CD2 and CD335 (NKp46) antibodies. NK cells were isolated using the NK Cell Isolation Kit, human and expanded using one loaded Anti-Biotin MACSiBead Particle per two NK cells. NK cells were cultured in medium supplemented with 10% FBS and 500 IU/mL rIL-2 at an initial density of 10⁶ NK cells per mL. Cells were expanded for 3 weeks. For comparison, NK cells were cultured in medium supplemented with 10% FBS and 500 IU/mL rIL-2 alone.

MACS Cytokines—meet your demands

MACS Cytokines are optimized for demanding applications such as cell culture, differentiation studies, and biological assays, and are available in the appropriate quality format for basic, pre-clinical, and clinical research:

Clinical research: GMP-grade cytokines

- For *ex vivo* cell culture processing or research use, and not intended for human *in vivo* applications.
- Manufactured according to relevant GMP guidelines.
- Animal- or human-derived component-free.
- Lyophilized without carrier protein or preservatives.
- Standardized lot-specific biological activities.

Basic research: premium- and research-grade cytokines

- High-quality products for cost-effective, consistent, and reliable cell culture results.
- Small to bulk sizes, customized solutions.
- Premium-grade cytokines share major characteristics with GMP-grade cytokines, e.g., standardized International units, low endotoxin levels.

Lot-specific biological activities calibrated with international standards (NIBSC) avoid revalidation efforts by allowing exact unit dosing and facilitate reproducible cell culture conditions.



Figure 13: Human premium grade MACS Cytokines. Refer to page 13 for product ordering information.

Miltenyi Biotec's broad portfolio of recombinant cytokines, growth factors, and related proteins is continuously growing. To learn more visit www.miltenyibiotec.com/cytokines.

Capture the moment

Isolation of cytokine-secreting NK cells

'Catch' activated NK cells for functional analysis

MACS Cytokine Secretion Assays enable analysis and enumeration of viable cytokine-secreting leukocytes by flow cytometry.

Benefit from this reliable and unique technology:

- Viable cells can be easily isolated prior to analysis.
- Assay facilitates unrivalled analytical sensitivity—NK cells can be detected at frequencies ranging from 0.01% to 0.1%.
- Assay is fully compatible with the MACSQuant Analyzer, simplifying analysis by flow cytometry.
- Simultaneous phenotyping of cytokine-secreting cells for more detailed information on subsets and activation status.

Many studies have utilized MACS Cytokine Secretion Assays, for example:

- The IFN- γ Secretion Assay was used to separate two NK cell subsets according to IFN- γ secretion¹⁸.
- The IL-10 Secretion Assay was used to characterize NK cell subsets according to the potency of their IL-10 secretion¹⁹.
- The role of several cytokines in mediating the NK cell repertoire was investigated²⁰.

Refer to page 12 for product ordering information.

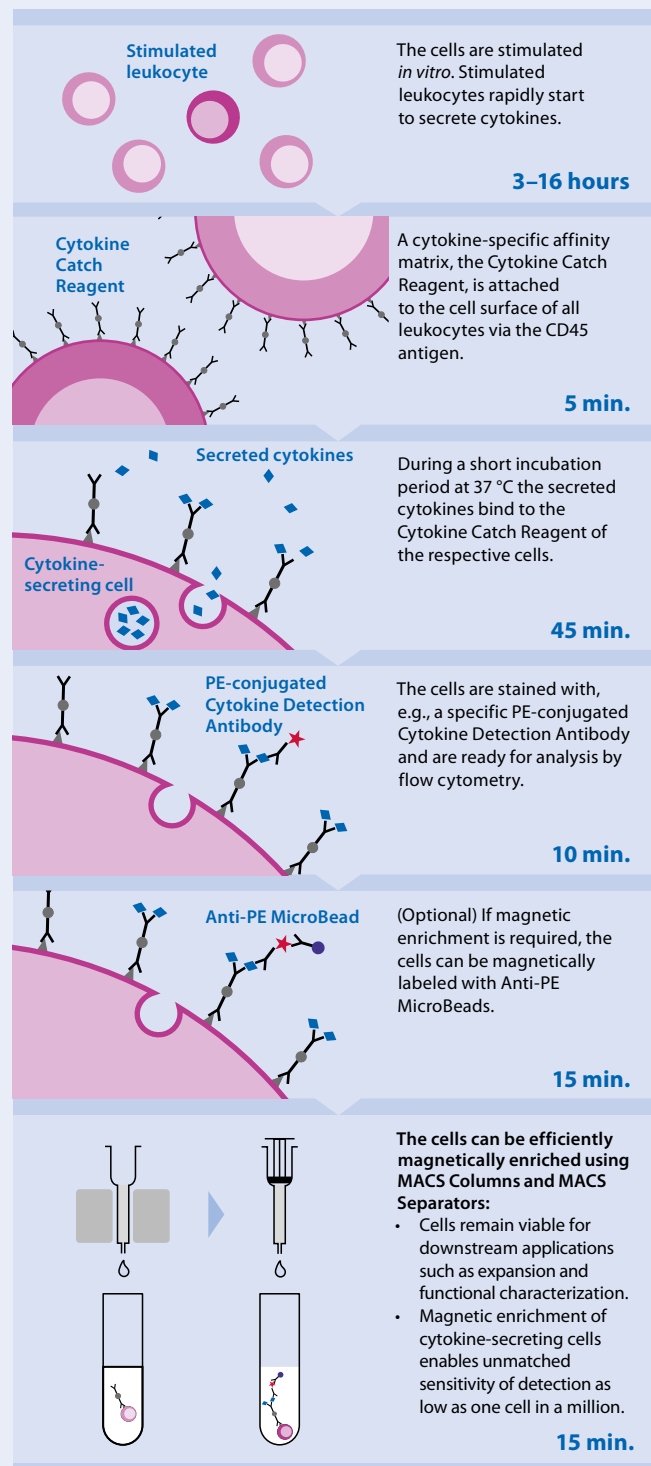


Figure 14: Cytokine secretion assays—the principle

Order information

Place your order by fax, phone, or online!

Products	Separation strategy	Order no.
MACS Products for the isolation of human NK cells		
NK Cell Isolation Kit	Untouched isolation	130-092-657
CD56 MicroBeads	Positive selection	130-050-401
CD56 MultiSort Kit	Isolation of NK cell subsets by sequential sorting	130-055-401
Whole Blood CD56 MicroBeads	Positive selection	130-090-875
CD3 MicroBeads	Positive selection	130-050-101
CD8 MicroBeads	Positive selection	130-045-201
CD16 MicroBeads	Positive selection	130-045-701
CD57 MicroBeads	Positive selection	130-092-073
MACS Products for the isolation of human NK cell subsets		
CD56 ⁺ CD16 ⁻ NK Cell Isolation Kit	Positive selection	130-092-661
CD56 ⁺ CD16 ⁺ NK Cell Isolation Kit	Positive selection	130-092-660
CD56 ⁺ CD8 ⁺ /CD8 ⁻ NK Cell Isolation Kit	Positive selection	130-092-659
CD56 ⁺ CD57 ⁺ NK Cell Isolation Kit	Positive selection	130-093-395
CD3 ⁺ CD56 ⁺ NKT Cell Isolation Kit	Positive selection	130-093-064
Anti-iNKT MicroBeads	Positive selection	130-094-842
MACS Products for the isolation of NK cells from mouse and non-human primate		
NK Cell Isolation Kit, mouse	Untouched isolation	130-090-864
CD49b (DX5) MicroBeads, mouse	Positive selection	130-052-501
Anti-NKp46 MicroBead Kit, mouse	Positive selection	130-095-390
CD16 MicroBeads, non-human primate	Positive selection	130-091-145
MACS Products for indirect isolation of NK cells		
Anti-FITC MicroBeads		130-048-701
Anti-PE MicroBeads		130-048-801
Anti-APC MicroBeads		130-090-855
Anti-Biotin MicroBeads		130-090-485
One-step Antibody Biotinylation Kit		130-093-385
NK Cell Activation/Expansion Kit (human)		
NK Cell Activation/Expansion Kit (human)		130-094-483
Products for KIR typing of human NK cells		
KIR Typing Kit, 8 tests		130-092-551
KIR Typing Kit, 24 tests		130-092-584

For contact details please see the back cover.



Products	FITC	PE	APC	Biotin	VioBlue	pure	PerCP
Products for KIR phenotyping of human NK cells							
Anti-KIR2D	-	130-092-688	130-092-687	130-092-904	-	130-092-689	-
CD158a/h (KIR2DL1/DS1)	130-092-811	130-092-684	130-092-685	130-092-683	130-095-233	130-092-682	-
CD158b (KIR2DL2/DL3)	-	130-092-618	130-092-617	-	-	130-092-615	130-095-285
CD158e (KIR3DL1)	130-092-568	130-092-473	130-092-474	130-092-475	130-095-234	130-092-555	130-095-287
CD158e/k (KIR3DL1/DL2)	-	130-095-205	130-095-203	130-095-201	-	130-095-199	-
CD158f (KIR2DL5)	-	130-096-199	-	-	-	130-096-200	-
CD158i (KIR2DS4)	-	130-092-680	130-092-681	130-092-898	-	130-092-679	-
Antibodies for NK cell analysis (human)							
CD2	-	130-091-115	-	-	-	-	-
CD3	130-080-401	130-091-374	130-091-373	-	130-094-363	-	130-094-965
CD8	130-080-601	130-091-084	130-091-076	-	130-094-152	-	130-094-972
CD11b	130-081-201	130-091-240	130-091-241	-	-	-	-
CD11c	130-092-410	130-092-411	130-092-412	130-092-413	-	130-092-414	-
CD16	130-091-244	130-091-245	130-091-246	-	-	-	-
CD26	-	130-093-440	130-093-441	130-093-442	-	-	-
CD27	130-093-184	130-093-185	130-093-186	130-093-196	-	-	-
CD45	130-080-202	130-080-201	130-091-230	-	130-092-880	-	130-094-975
CD56	-	130-090-755	130-090-843	-	-	130-090-955	-
CD57	130-092-174	130-092-139	130-092-141	130-092-620	-	-	-
CD62L	130-091-757	130-091-756	130-091-755	-	-	-	-
CD69	-	130-092-160	130-092-159	130-092-161	-	-	-
CD154	-	130-092-289	130-092-290	130-092-690	-	-	-
CD161 (NKR-P1A)	130-092-907	130-092-67	130-092-678	130-092-906	-	130-092-676	-
CD226 (DNAM-1)	-	130-092-476	130-092-477	130-092-478	-	130-092-479	-
CD314 (NKG2D)	-	130-092-672	130-092-673	130-092-825	-	130-092-686	-
CD335 (NKp46)	-	130-092-607	130-092-609	130-094-659 (functional grade)	-	130-094-271 (functional grade) 130-092-608	-
CD336 (NKp44)	-	130-092-480	130-092-481	130-092-482	-	130-092-556	-
CD337 (NKp30)	-	130-092-483	130-092-484	130-092-553	-	130-094-272 (functional grade) 130-092-554	-
Anti-iNKT (6B11)	-	130-094-838	130-094-839	130-094-841	-	130-094-865 (functional grade)	-
Anti-NKp80	130-094-843	130-094-844	130-094-845	130-095-114	-	130-094-846	-
Anti-IFN- γ	130-091-641	130-091-653	130-091-640	-	-	-	-
Anti-TNF- α	130-091-650	130-091-651	130-091-649	-	-	-	-

For more information about antibodies refer to www.miltenyibiotec.com/antibodies.

Order information

Place your order by fax, phone, or online!

Products	FITC	PE	APC	Biotin	VioBlue	pure	PerCP
Antibodies for NK cell analysis (mouse)							
Anti-IFN- γ	-	130-092-346	130-092-347	-	-	-	-
Anti-TNF- α	130-092-244	130-092-245	130-092-246	-	-	-	-
Anti-NK1.1	-	130-095-867	130-095-869	130-095-865	-	-	-
Anti-NKp46	130-095-115	130-095-116	130-095-119	130-095-117	-	130-095-118	-
CD3 ϵ	130-092-962	130-092-976	130-092-977	-	-	-	-
CD4	130-091-608	130-091-607	130-091-611	-	-	-	-
CD8a	130-091-605	130-091-603	130-091-606	-	130-094-360	-	-
CD11b	130-081-201	130-091-240	130-091-241	-	-	-	-
CD11c	130-091-842	130-091-830	130-091-844	-	-	-	-
CD16/32	-	130-092-572	130-092-573	130-092-570	-	130-092-574	-
CD28	-	130-093-180	-	130-093-181	-	-	-
CD49b (DX5)	130-091-814	130-091-816	130-091-813	-	-	-	-
CD62L	130-091-792	130-091-794	130-091-805	-	-	-	-
Antibodies for NK cell analysis (non-human primate)							
CD16	130-091-244	130-091-245	130-091-246	-	-	-	-
CD56	-	130-090-755	130-090-843	-	-	130-090-955	-
MACS Cytokine Secretion Assays							
IFN- γ Secretion Assay Cell Enrichment and Detection Kit	-	130-054-201	-	-	-	-	-
IFN- γ Secretion Assay Detection Kit	130-090-433	130-054-202	130-090-762	-	-	-	-
TNF- α Secretion Assay Cell Enrichment and Detection Kit	-	130-091-269	-	-	-	-	-
TNF- α Secretion Assay Detection Kit	-	130-091-268	130-091-267	-	-	-	-
IL-10 Secretion Assay Detection Kit	-	130-090-434	130-090-761	-	-	-	-
IL-10 Secretion Assay - Cell Enrichment and Detection Kit	-	130-090-435	-	-	-	-	-
MACS Cytokine Secretion Assays (mouse)							
Mouse IFN- γ Secretion Assay Cell Enrichment and Detection Kit	-	130-090-517	-	-	-	-	-
Mouse IFN- γ Secretion Assay Detection Kit	-	130-090-516	130-090-984	-	-	-	-

For more information about antibodies refer to www.miltenyibiotec.com/antibodies.

For contact details please see the back cover.



Products	Quantity	Order no.
MACS Cytokines and Growth Factors (human)		
Human Flt3-Ligand, research grade	2 µg	130-093-853
	10 µg	130-093-854
	100 µg	130-093-855
	1000 µg	130-093-856
Human IFN-γ, research grade	50 µg	130-093-880
	100 µg	130-093-882
	1000 µg	130-093-883
Human IL-2, research grade	5 µg	130-093-901
	50 µg	130-093-903
Human IL-2 (v126), research grade	5 µg	130-093-906
	50 µg	130-093-907
	1000 µg	130-094-622
Human IL-3, research grade	10 µg	130-093-908
	25 µg	130-093-909
	4x25 µg	130-094-193
Human IL-3, premium grade	10 µg	130-095-071
	25 µg	130-095-070
	100 µg	130-095-069
	1000 µg	130-095-068
Human IL-7, research grade	10 µg	130-093-937
	25 µg	130-095-367
	100 µg	130-093-939
Human IL-7, premium grade	10 µg	130-095-361
	25 µg	130-095-362
	100 µg	130-095-363
	1000 µg	130-095-364
Human IL-12, research grade	2 µg	130-093-951
	10 µg	130-093-952
	100 µg	130-094-624
Human IL-15, research grade	10 µg	130-093-955
	25 µg	130-095-760
Human GM-CSF, research grade	10 µg	130-093-862
	50 µg	130-095-372
Human GM-CSF, premium grade	10 µg	130-093-864
	50 µg	130-093-865
	100 µg	130-093-866
	500 µg	130-093-867
	1000 µg	130-093-868
Human SCF, research grade	2 µg	130-093-990
	10 µg	130-093-991
	50 µg	130-093-992
	100 µg	130-093-993
	1000 µg	130-094-303
Human TRAIL, research grade	10 µg	130-094-025
	50 µg	130-094-026

Products	Quantity	Order no.
MACS Cytokines and Growth Factors (mouse)		
Mouse Flt3-Ligand	10 µg	130-094-038
Mouse IFN-α	200 µL, liquid	130-093-131
	1 mL, liquid	130-093-130
Mouse IFN-γ	20 µg	130-094-047
	100 µg	130-094-048
	1000 µg	130-094-049
Mouse IL-2	5 µg	130-094-054
	20 µg	130-094-055
Mouse IL-3	2 µg	130-094-056
	10 µg	130-094-057
	100 µg	130-094-633
	1000 µg	130-094-661
Mouse IL-7	2 µg	130-094-636
	10 µg	130-094-066
Mouse IL-12	10 µg	130-094-069
Mouse IL-15	2 µg	130-094-071
	10 µg	130-094-072
	100 µg	130-094-640
Mouse IP-10	5 µg	130-094-073
	25 µg	130-094-641
Mouse G-CSF	2 µg	130-094-039
	10 µg	130-094-040
	100 µg	130-094-041
Mouse GM-CSF	10 µg	130-094-043
	25 µg	130-095-746
Mouse GM-CSF, premium grade	10 µg	130-095-742
	25 µg	130-095-793
	100 µg	130-095-739
	1000 µg	130-095-735
Mouse M-CSF	2 µg	130-94-642
	10 µg	130-094-129
	100 µg	130-094-643
	1000 µg	130-094-810
Mouse MIG	5 µg	130-094-644
	20 µg	130-094-128
Mouse SCF	2 µg	130-094-078
	10 µg	130-094-079
	100 µg	130-094-080
	1000 µg	130-094-902
Mouse VEGF (164 aa)	5 µg	130-094-086
	10 µg	130-094-088
MACS GMP Cytokines		
MACS GMP Recombinant Human IL-2	20 µg	170-076-113
MACS GMP Recombinant Human GM-CSF	25 µg	170-076-112

Refer to www.miltenyibiotec.com/cytokines for a complete list of cytokines from Miltenyi Biotec.

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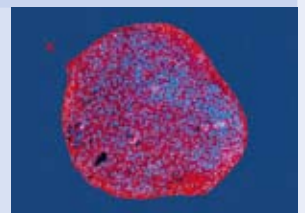


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More than 14,500 studies used Miltenyi Biotec products

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