



Miltenyi Biotec

# autoMACS<sup>®</sup> Pro Separator

Automated gold standard in cell separation



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**Proven in countless publications**

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**Complete automation for  
walk-away convenience**

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**The most advanced technology**

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**Experience premium results and  
excellent support**

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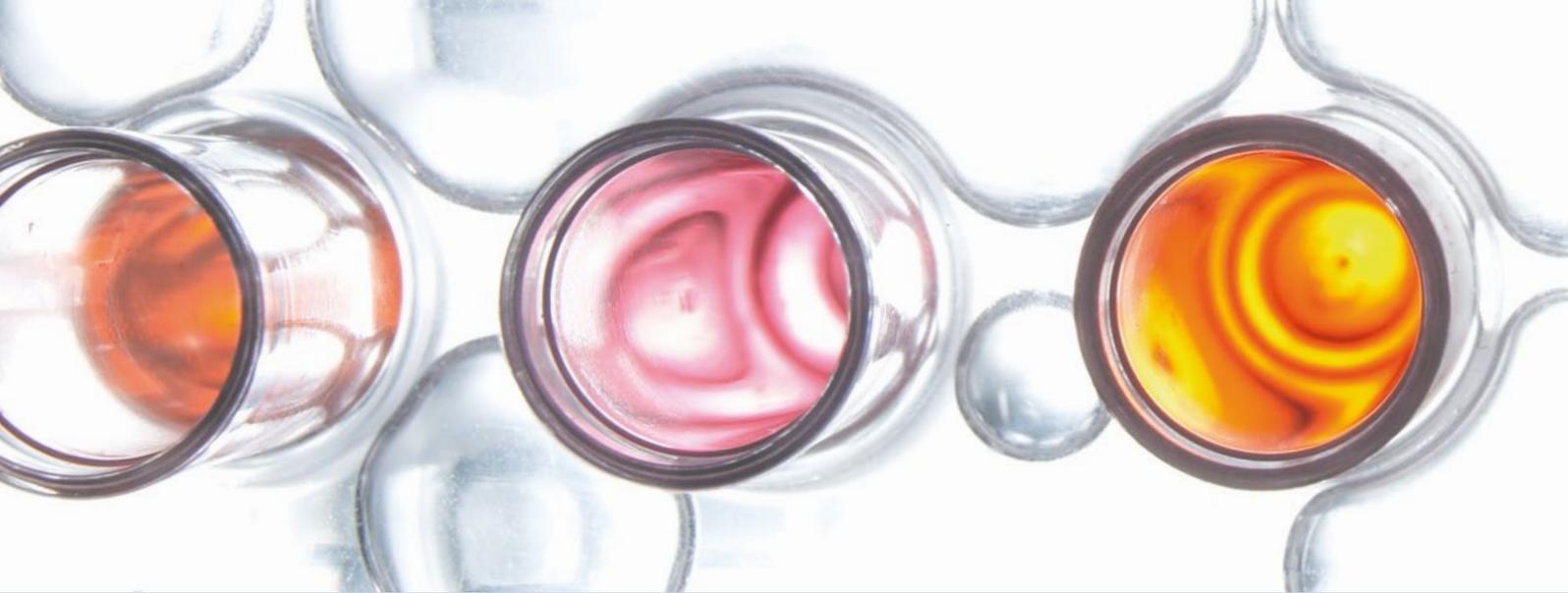
**Supporting late breaking research**

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**User-friendly cell separation  
in 3 easy steps**

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**Automate & advance**



## Technology that inspires

### Complete solutions for pioneering research

Miltenyi Biotec offers a complete portfolio of research tools that enables a seamless workflow, from reproducible sample preparation to a variety of

downstream applications. Move from step to step of your procedure with complete confidence, MACS® Solutions are the perfect companion for inspired research.

#### Sample preparation

- Time-saving and standardized dissociation of tissues
- High yields, high cell viability, high reproducibility



#### Cell separation

- MACS Technology, the gold standard in cell separation
- Standardized enrichment or depletion



#### Cell analysis

- Easy-to-use bench-top flow cytometers
- Titrated high-quality antibodies and brilliant fluorochromes



#### Cell culture

- Serum-free medium and supplement for long-term viability
- GMP, premium, and research-grade cytokines



#### Small animal imaging

- Contrast agents optimized for small animal imaging
- MRI, optical imaging, CT, and ultrasound



#### Molecular analysis

- Efficient mRNA amplification from small samples
- Genomic services for mRNA and microRNA expression analysis





# Cell separation technology

Take your research to the next level with MACS® Technology

## Benefit from MACS® Technology

MACS® Technology is based on the following three unique components:

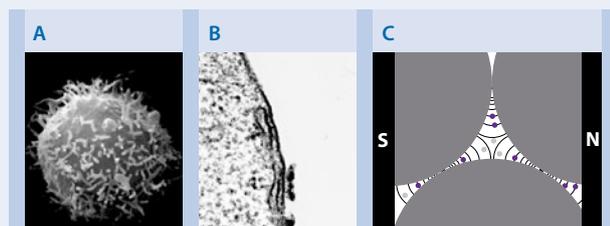
### MACS® MicroBeads

MACS® MicroBeads are 50-nm superparamagnetic particles that are conjugated to highly specific antibodies against a particular antigen on the cell surface. Due to the small size, they will not saturate cell surface epitopes. Unlike larger beads, MACS MicroBeads do not have to be removed for any downstream application. MicroBeads are non-toxic and biodegradable. They have been tested according to the International Standard (ISO 10993) and USP guidelines for biocompatibility. The MACS MicroBeads truly take your research from bench to bedside.

Only MACS MicroBeads are always in suspension (colloidal) – allowing fast binding kinetics and short labeling procedures. Unlike non-colloidal or very large beads, you will never have to deal with clumping artifacts and you can count on superb quality and lot-to-lot consistency.

### MACS® Columns

MACS® Columns contain a matrix composed of ferromagnetic spheres covered with a cell-friendly coating. When placed on a magnetic separator, the spheres amplify the magnetic field by 10,000-fold, thus inducing a high gradient within the column. This is crucial for isolation of cells which are only minimally labeled, leaving enough epitopes free for concurrent antibody staining.



**Figure 1:** MicroBead features. Scanning electron microscopy of a cell isolated with MACS MicroBeads (A) 50 nm MicroBeads are so small they can only be seen on a Transmission Electron Microscope (B). A cross section of a MACS Column showing the ferromagnetic spheres (gray) with the magnetic field in which labeled cells (purple) are retained (C).

### MACS® Separators

MACS® Separators are available in different formats to accommodate different column options.

The combination of MACS MicroBeads, columns, and the magnetic separator provide the perfect tool set for unmatched cell separation results.



## Introducing the autoMACS® Pro Separator

The gold standard in automated cell separation

Performing cell separations has never been easier with the autoMACS® Pro Separator. This innovative instrument eliminates the need for manual sample handling steps, saving time while providing reliability and reproducibility in cell sorting. The autoMACS Pro Separator has been specifically designed for automated handling of multiple samples.

An overview of the instrument's outstanding capabilities:

- High-performance cell sorting based on renowned MACS® Technology.
- Walk-away cell isolation with smart sensor controls.
- Automated labeling of samples.
- Compact design for benchtop use or laminar flow cabinets.
- User-friendly touchscreen interface.

The instrument is UL-listed and CE-marked.

autoMACS Pro Separator – Starter Kit	Order no.
autoMACS Pro Separator, MiniSampler, MACS Reagent Rack 4, Chill 5, 15, 50 Rack Set, software, barcode reader, 5x2 autoMACS Columns, 2x2 column substitutes, autoMACS Pro Buffer Combination, user manual and short instructions, one-year warranty	130-092-545

**Table 1:** The components of an autoMACS Pro Separator – Starter Kit.

Technical data	
Color	Blue/orange
Footprint*	605x343 mm
Footprint with MiniSampler*	605x455 mm
Height	392.5–454 mm (adjustable touchscreen)
Weight	25kg
Input voltage	100–240 VAC, 50–60 HZ
Power consumption	200 VA
Fuses	2xT4A/250
Programs	12 preset

\* Depending on the type of power plug chosen, the depth increases by 27 mm or 62 mm.

**Table 2:** Technical specifications for the autoMACS Pro Separator.

Cell separation specifications at a glance	
Column capacity	4x10 <sup>9</sup> cells/sample 2x10 <sup>8</sup> magnetically labeled cells/sample
Sample volume input	0.25 mL – 50 mL
Whole blood processing volumes	0.25 mL – 15 mL
Reagents	MACS MicroBeads and kits can all be used manually or with the autoMACS Pro Separator – same reagents, multiple capabilities

**Table 3:** Cell separation specifications at a glance.



## Autolabeling of multiple samples

Easy as 1–2–3

### Product information

Autolabeling lets you achieve reproducibility every time by anyone in your lab, no expertise required.

Discover the convenience of walk-away cell separations, while ensuring the consistency of your results. It only takes three simple steps:

1. Scan reagents using barcode reader
2. Position samples and reagents on instrument
3. Select “run” and walk away!

The barcode will recognize the reagents and select the appropriate separation and wash program. Hands-free sample processing leads to safe laboratory practices, of vital importance when dealing with hazardous samples.



**Figure 2:** Reagent scanning for easy autolabeling.



**Figure 3:** The MACS Reagent Rack 4 holds up to four reagent vials for autolabeling of multiple samples.

# Sample handling

## Maintaining the integrity of your samples

With the MACS® Chill Racks you maintain your samples at 4 °C during the labeling and separation process to ensure the highest viability rate and to prevent gene expression changes associated with temperature variations.

Multiple sample capability with MACS® Chill Racks and MACS MiniSampler:

- Unique Chill Racks allow up to 6 samples to be processed in a single batch.
- Chill racks provide optimal cooling of samples during separation process.
- Flexible format, available for use with 50 mL, 15 mL, or 5 mL tubes.
- The MACS MiniSampler accommodates one MACS Chill Rack and one MACS Reagent Rack that holds up to four reagent vials for convenient autolabeling.



**Figure 4:** Chill Racks available for 5 mL tubes, 15 mL tubes, and 50 mL tubes.



**Figure 5:** MiniSampler seamlessly accommodates Chill Racks and Reagent Rack.

Maximal number of samples	Manual labeling Maximal sample volume	Autolabeling Minimal incubation volume	Autolabeling Maximal labeling volume
6 (5 mL tubes)	2.5 mL	0.2 mL 0.25 mL*	2.0 mL 1 mL*
5 (15 mL tubes)	12.5 mL	0.2 mL 1 mL*	6.5 mL 4 mL*
3 (50 mL tubes)	50 mL	4 mL*	8 mL*

\* Volumes refer to whole blood samples only.

**Table 4:** Overview on Chill Racks and capacities per tube.

# Sensor-controlled processes

## Sample safety is ensured

The autoMACS® Pro Separator includes a fully automated sensor-controlled process that ensures the safety of your precious samples.

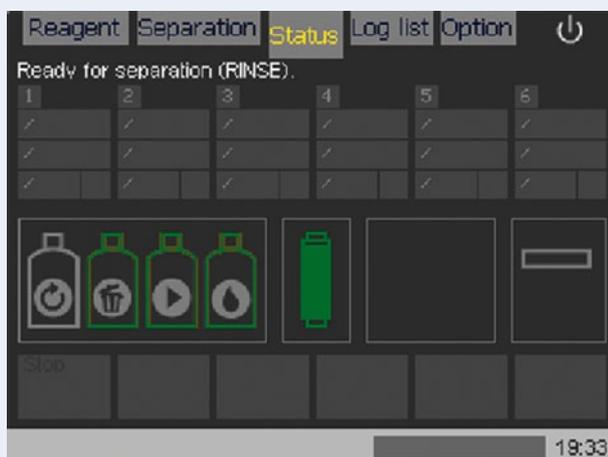
- Bottle illumination indicates instrument status, observable from across the laboratory.
- Monitoring of buffer fluid levels.
- Monitoring of column status.
- Automatic detection of hardware peripherals ensures optimal performance.

### Automated hassle-free housekeeping

- Instrument performs automated startup, cleaning, and shutdown.
- Optimized and efficient washing, decontamination, and maintenance programs.
- Continuous monitoring of necessary buffers and waste levels.



**Figure 6:** Bottle illumination is designed to facilitate monitoring of instrument status.



**Figure 7:** Status menu screen will display instrument status, fluid container status, and monitor column status.



## Intuitive software and experimental freedom

Unlimited possibilities for automated cell separation

### Software to ease your research needs

The high-resolution touchscreen with intuitive menus allows for convenient and easy operation. With twelve pre-set separation programs, count on optimal results every time.

Additionally, the status menu provides continuous monitoring of sample processing.

### Isolation of virtually any cell type from any species and tissue source

- Compatible with a wide variety of MACS® Cell Separation Reagents.
- Reagents available for immune cells, stem cells, cancer cells, and neural cells.
- Efficient separation of rare cell subsets, such as antigen-specific, cytokine-secreting cells.

### Indirect magnetic labeling for the isolation of virtually any cell type

If the reagent of particular interest is not included in the MACS Cell Separation Reagent portfolio, then there is the option to use the primary antibody of choice in combination with indirect magnetic labeling for your cell separation.

### Indirect magnetic labeling

- Enrichment or depletion of cells from any cell type or tissue.
- Almost any primary antibody can be used for cell isolation.
- Enhanced magnetic labeling allows sorting of cells according to weakly expressed antigens.
- Compatible with fluorescent staining for flow cytometric analysis.



## Experimental creativity

Some highlights of cutting-edge research we support

### Whole blood applications

MACS® Whole Blood MicroBeads allow automated magnetic cell sorting directly from whole blood or bone marrow – from whole blood to pure cells in 30 minutes, without the need for density-gradient centrifugation or red blood cell lysis.

### Chimerism and HLA analysis

High-quality purified cells are a prerequisite for sensitive lineage-specific chimerism analysis, cross-match analysis, and HLA applications. With direct isolation from whole blood on the autoMACS® Pro Separator, patient cells are immediately available for functional studies.

### Multiple myeloma analysis

Whole Blood CD138 MicroBeads in combination with the autoMACS Pro Separator allow the isolation of plasma cells directly from bone marrow. We have developed an SOP for an automated, reliable, and standardized method, which allows the processing of multiple samples in a single day, while maintaining sample integrity and increasing the sensitivity of FISH analysis and whole genome arrays.

### HIV

Minimize virus exposure, sample handling, and manipulation in HIV research. With the autoMACS Pro Separator and Whole Blood MicroBeads, just place whole blood samples and let the instrument perform the isolations of lymphocytes required for your HIV research.

### Special applications

#### Hematopoietic stem cells

We offer a broad range of cell separation reagents for the isolation of hematopoietic stem cells (HSC) and hematopoietic progenitor cells (HPC). Our founding product for HSC/HPC isolation, CD34 MicroBeads, has been cited more than 2,000 times since its release and has been available as a CE-marked reagent since 1997. Isolate human HSC with the highest purity and yields using the autoMACS Pro Separator.

#### An alternative to flow sorting

As compared to the lengthy process of flow sorting, isolating cells on the autoMACS Pro Separator can take as little as 30 minutes. With the high cell throughput capability of  $10^9$ – $10^{10}$  cells/hour, you can maximize your time, while obtaining functional, viable cells.

#### Yeast cell isolation

Whether using isolated yeast cells as cancer models or using yeast for purification of antibody libraries, the autoMACS Pro Separator can accommodate 50 mL samples for high-quality isolation of tagged target cells.

#### Molecular applications

The best results come from samples of the highest quality. Get the pure and viable cells required for sensitive downstream molecular analysis, such as whole genome arrays, SNP arrays, and next-generation sequencing.

Check out further applications at [www.automacspro.com](http://www.automacspro.com)



## Further information

### Support and service contracts

Miltenyi Biotec offers premium technical support and service optimized to meet the standards of even the busiest laboratories.

#### Technical and application advice with a difference

Miltenyi Biotec technical teams are composed of experienced scientists and highly trained service engineers. The teams offer advice ranging from experimental design and sample preparation to answering specific questions about instrument operation and service options.

A wealth of technical support is easily accessible by visiting the Miltenyi Biotec website:

- Online forum for technical and product discussions.
- Comprehensive list of frequently asked questions.
- Library of datasheets and special protocols.

#### Service contracts tailor-made for customer needs

A suitable service agreement will:

- reduce the costs by avoiding instrument downtime or sample loss,
- maintain instrument performance and ultimately the quality of data,
- assure that a Miltenyi Biotec representative is only a phone call away.

For more details, please refer to:

► [automacspro.com](https://www.miltenyibiotec.com/automacspro.com)

#### Accessory information

Accessory	Description	Order no.
Chill 5 Rack	Chill Rack for 5 mL tubes	130-092-951
Chill 5 Rack, Box of 3	3×Chill Rack for 5 mL tubes	130-097-041
Chill 15 Rack	Chill Rack for 5 and 15 mL tubes	130-092-952
Chill 15 Rack, Box of 3	3×Chill Rack for 5 and 15 mL tubes	130-097-036
Chill 50 Rack	Chill Rack for 5, 15 and 50 mL tubes	130-092-953
Chill 50 Rack, Box of 3	3×Chill Rack for 5, 15 and 50 mL tubes	130-097-037
Chill 5, 15, 50 Rack Set	Set of three Chill Racks	130-097-038
MACS Reagent Rack 4	Accommodates 4 vials of MACS Reagents	130-094-574
Air-Filter Extension Set	Extension tube and hydrophobic air filter for the autoMACS Fluid Bottles	130-091-339
autoMACS Pro Laminar Hood Plate	Metal plate for operating the autoMACS Pro Separator in a laminar flow hood	130-093-246
autoMACS Pro Angle Connector Set	Space-saving angle adaptors for cables connecting to the autoMACS Pro Separator	130-093-245
autoMACS Pro Protection Cover	Protection foil for long-term storage of the autoMACS Pro Separator	130-093-532

**Table 5:** All accessories available with the autoMACS Pro Separator.



# Revolutionary automated cell biology workflows

## Designed for automation

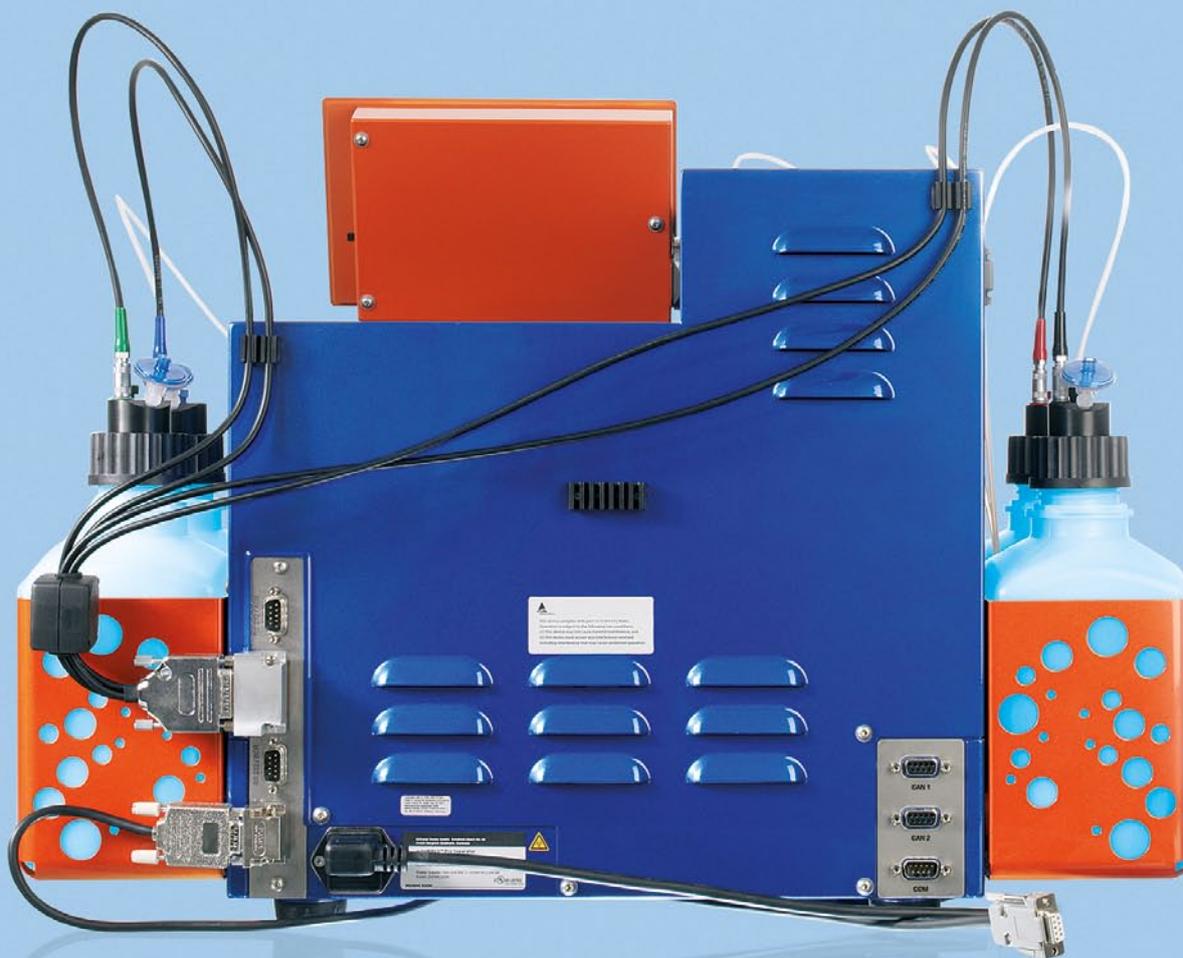
From parallel cell isolations with the MultiMACS™ Cell24 Separator, to fully automated consecutive separations of multiple cell samples, we offer flexible workflow solutions for automating MACS® Technology. Integrating Miltenyi Biotec instruments into liquid handling platforms provides you with comprehensive solutions for complex multistep workflows while increasing productivity with unattended operation day and night. Best of all, systems are completely flexible and customizable to meet specific research needs.

Intrinsic features of MACS MicroBeads make them perfect for automation. MicroBeads are in colloidal solution, meaning they are well dispersed, will not sediment, and require no mixing. This facilitates rapid target binding, short incubation times, and rapid separation protocols. MicroBeads handle like a liquid, a perfect complement for automation.

Whether your sample will contain hundreds or millions of cells, MACS Technology in combination with liquid handling platforms provides you with scalable options and protocols. Step into the future with complete workflow automation.



**Figure 8:** A complete automated workflow solution. The MultiMACS Cell24 Separator for processing of 24 samples in parallel, MultiMACS M96 Separator for parallel processing of multiple samples in molecular biology and protein applications, and the MACSQuant® Analyzer – the best in class flow cytometer.



► [automacspro.com](http://automacspro.com)



Miltenyi Biotec

**Germany/Austria/  
Switzerland**

Miltenyi Biotec GmbH  
Friedrich-Ebert-Straße 68  
51429 Bergisch Gladbach  
Germany  
Phone +49 2204 8306-0  
Fax +49 2204 85197  
macs@miltenyibiotec.de

**USA/Canada**

Miltenyi Biotec Inc.  
2303 Lindbergh Street  
Auburn, CA 95602, USA  
Phone 800 FOR MACS  
Phone +1 530 888 8871  
Fax +1 530 888 8925  
macs@miltenyibiotec.com

**Australia**

Miltenyi Biotec  
Australia Pty. Ltd.  
Unit 16A, 2 Eden Park Drive  
North Ryde, NSW 2113,  
Australia  
Phone +61 2 8877 7400  
Fax +61 2 9889 5044  
macs@miltenyibiotec.com.au

**Benelux**

Miltenyi Biotec B.V.  
Schipholweg 68 H, 2316 Leiden  
The Netherlands  
macs@miltenyibiotec.nl

**Customer service Netherlands**

Phone 0800 4020120  
Fax 0800 4020100

**Customer service Belgium**

Phone 0800 94016  
Fax 0800 99626

**Customer service Luxembourg**

Phone 800 24971  
Fax 800 24984

**China**

Miltenyi Biotec GmbH  
Shanghai Office  
Rm. 2309  
No. 319 Xianxia Rd.  
Shanghai 200051, P.R. China  
Phone +86 21 62351005  
Fax +86 21 62350953  
macs@miltenyibiotec.com.cn

**France**

Miltenyi Biotec SAS  
10 rue Mercœur  
75011 Paris, France  
Phone +33 1 56 98 16 16  
Fax +33 1 56 98 16 17  
macs@miltenyibiotec.fr

**Italy**

Miltenyi Biotec S.r.l.  
Via Persicetana, 2/D  
40012 Calderara di Reno (BO)  
Italy  
Phone +39 051 6 460 411  
Fax +39 051 6 460 499  
macs@miltenyibiotec.it

**Japan**

Miltenyi Biotec K.K.  
Nittsu-Eitai Building 5F  
16-10 Fuyuki, Koto-ku,  
Tokyo 135-0041, Japan  
Phone +81 3 5646 8910  
Fax +81 3 5646 8911  
macs@miltenyibiotec.jp

**Singapore**

Miltenyi Biotec  
Asia Pacific Pte Ltd.  
100 Beach Road  
#28-06 to 28-08 Shaw Tower  
Singapore 189702  
Phone +65 6238 8183  
Fax +65 6238 0302  
macs@miltenyibiotec.com.sg

**Spain**

Miltenyi Biotec S.L.  
C/Luis Buñuel 2  
Ciudad de la Imagen  
28223 Pozuelo de Alarcón  
(Madrid), Spain  
Phone +34 91 512 12 90  
Fax +34 91 512 12 91  
macs@miltenyibiotec.es

**United Kingdom**

Miltenyi Biotec Ltd.  
Almac House, Church Lane  
Bisley, Surrey GU24 9DR, UK  
Phone +44 1483 799 800  
Fax +44 1483 799 811  
macs@miltenyibiotec.co.uk

[www.miltenyibiotec.com](http://www.miltenyibiotec.com)

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