

Contents

1. Description
 - 1.1 Background
 - 1.2 Technical specifications
 - 1.3 Product applications
 - 1.4 Reagent and instrument requirements
2. Use of MS Columns
 - 2.1 Preparation of MS Columns
 - 2.2 Magnetic separation using MS Columns

1. Description

Components **MS Columns (# 130-042-201):**
25 MS Columns and plungers, sterile packed.
or
MS Columns plus tubes (# 130-041-301):
25 MS Columns and plungers (# 130-042-201), sterile packed, and 75×5 mL tubes for MS Columns (# 130-091-598), sterile packed as 3×25 tubes.

Storage Store columns dry and protected from light. The expiration date is indicated on the box label. Do not use after this date.

1.1 Background

The patented MACS® Column Technology is based on the use of MACS MicroBeads, MACS Columns and MACS Separators. MS Columns have been developed for the gentle isolation of MicroBead labeled cells. As MACS MicroBeads are extremely small, superparamagnetic particles, a high-gradient magnetic field is required to retain the labeled cells. MS Columns contain an optimized matrix to generate this strong magnetic field when placed in a permanent magnet such as the MiniMACS™ Separator, OctoMACS™ Separator, VarioMACS™ Separator, SuperMACS™ Separator or SuperMACS™ II Separator.

MS Columns contain a hydrophilic coating which allows rapid filling. This coating is washed out by rinsing the MS Column with buffer before separation. After incubation with MACS MicroBeads, the cell suspension is loaded onto the MS Column. The unlabeled cells run through while the magnetically labeled cells are retained on the MS Column. The retained material is washed with buffer to remove unlabeled material. After removal of the MS Column from the magnetic field, the magnetically retained cells can be eluted as the positively selected cell fraction, using the plunger supplied with the MS Column.

1.2 Technical specifications

- Column capacity: 1×10^7 magnetically labeled cells from up to 2×10^8 total cells.
▲ **Note:** Column capacity may decrease when separating cells larger than lymphocytes.
- Recommended sample size for leukocytes: 10^4 – 10^7 labeled cells in 10^6 – 2×10^8 total cells.
- Typical enrichment rate: 50fold to up to 1,000fold, depending on the strength and specificity of the magnetic labeling. Up to 10,000fold enrichment can be achieved by separation over two sequential columns.
- Columns are "flow stop" and do not run dry.
- Void volume: 60 µL. Reservoir volume: 3.5 mL.
- Typical flow rate for PBS (phosphate buffered saline) containing 0.5% BSA (bovine serum albumin): 0.35–0.5 mL/min.
- MS Columns are for single use only.

1.3 Product applications

MS Columns have been developed for positive selection of human and animal cells, especially rare cells, out of a heterogeneous cell suspension in combination with a MACS Separator. MS Columns can also be used for depletion of cells which strongly express the magnetically labeled surface antigen. They can also be used to separate other biological material such as plant cells, bacteria, viruses, protozoa, cell organelles etc.

▲ Do not use MS Columns in combination with magnetic particles other than MACS MicroBeads. Magnetic forces in the column are very high and may damage biological material if other beads are used.

▲ MS Columns are not suitable for particles larger than 30 µm. To remove clumps and to prevent aggregates in the sample, resuspend material carefully and pass through 30 µm nylon mesh (Pre-Separation Filters, # 130-041-407) before separation.

▲ Samples or buffers with high viscosity might cause reduced column flow or column clogging.

1.4 Reagent and instrument requirements

- **Buffer:** Prepare a solution containing phosphate-buffered saline (PBS), pH 7.2, 0.5% bovine serum albumin (BSA), and 2 mM EDTA by diluting MACS BSA Stock Solution (# 130-091-376) 1:20 with autoMACS™ Rinsing Solution (# 130-091-222). Keep buffer cold (2–8 °C).
▲ **Note:** The recommended buffer is PBS supplemented with EDTA and BSA. The suitability of other buffers has to be tested experimentally.
▲ **Note:** Use degassed buffer only! Degas buffer by applying vacuum, preferentially with buffer at room temperature. Excessive gas in running buffer will form bubbles in the matrix during separation. This may lead to clogging of the column and decrease the quality of separation.
- MACS MicroBeads for magnetic labeling of cells.
- MiniMACS Separator, OctoMACS Separator, VarioMACS Separator, SuperMACS Separator, or SuperMACS II Separator.

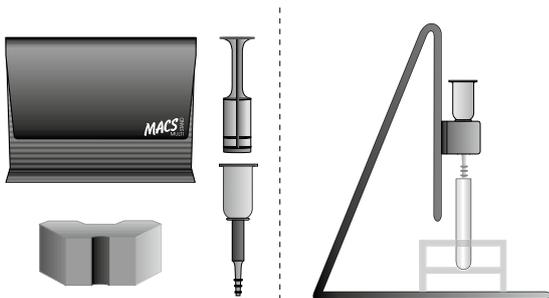
- MS Column Adapter (# 130-090-543) for use with VarioMACS Separator or SuperMACS Separator, or Adapter for MS, LS, and LD Columns for use with SuperMACS II Separator.
- MACS Acrylic Tube Rack (# 130-041-406) or OctoMACS Acrylic Tube Rack (# 130-090-448).
- (Optional) Pre-Separation Filters (# 130-041-407) to remove cell clumps.

2. Use of MS Columns

2.1 Preparation of MS Columns

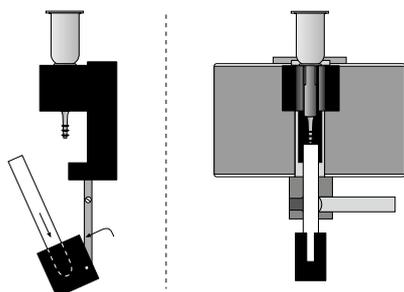
1. Insert MS Column with the column wings to the front into MACS Separator according to A), B), or C).

A) Use with MiniMACS™ or OctoMACS™ Separator



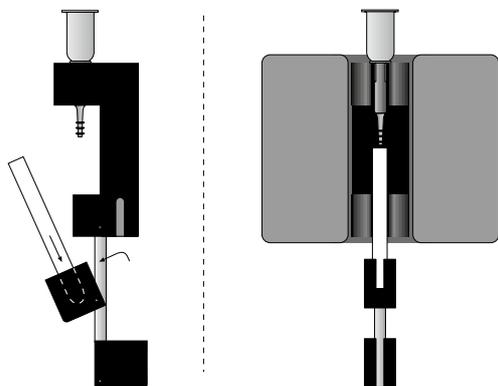
Attach MiniMACS™ Separator or OctoMACS™ Separator to the MultiStand and place MS Column in the Separator. Place a collection tube under the MS Column.

B) Use with VarioMACS™ or SuperMACS™ Separator



Insert MS Column Adapter in the magnetic field of the VarioMACS™ Separator or the SuperMACS™ Separator (for details, see MS Column Adapter Kit data sheet). Place the MS Column in the MS Column Adapter and the 5 mL collection tube in the tube holder.

C) Use with SuperMACS™ II Separator



Insert Adapter for MS, LS, and LD Columns in the magnetic field of the SuperMACS™ II Separator (for details, see SuperMACS II data sheets). Place the Column Adapter and the 5 mL collection tube in the upper tube holder.

2. Prepare MS Column by rinsing with buffer: apply 500 µL of degassed buffer on top of the column and let the buffer run through. MS Columns are "flow stop" and do not run dry.
3. Discard effluent and change collection tube. The MS Column is now ready for magnetic separation.

▲ **Note:** Use column immediately after filling to avoid formation of air bubbles caused by warming up. Do not store columns after filling.

▲ **Note:** The time for filling the column with buffer is dependent on the storage conditions, temperature and humidity. Therefore, the time may vary from a few seconds to several minutes. This filling time has no influence on the quality of the separation.

2.2 Magnetic separation using MS Columns

▲ For details on magnetic labeling, see MACS Cell Separation Reagent data sheets.

1. Resuspend up to 10^8 total cells in 500 µL of degassed buffer.
 - ▲ **Note:** For higher cell numbers, scale up buffer volume accordingly.
 - ▲ **Note:** When working with fresh anticoagulated blood or buffy coat, dilute before separation 1:2 with buffer.
 - ▲ **Note:** To remove clumps, pass cells through Pre-Separation Filters.
2. Apply cell suspension onto the prepared MS Column.
3. Collect unlabeled cells which pass through. Wash MS Column with 3×500 µL degassed buffer, adding buffer each time once the column reservoir is empty. Collect total effluent. This is the unlabeled cell fraction.
4. Remove MS Column from the separator and place it on a new collection tube.
5. Pipette 1 mL buffer onto the MS Column. Immediately flush out fraction with the magnetically labeled cells by firmly applying the plunger supplied with the column.

▲ **Note:** To increase the purity of the magnetically labeled fraction, it can be passed over a second, freshly prepared MS Column:

1. Apply the positive fraction directly onto a new, freshly prepared MS Column.
2. Wash with 3×500 µL buffer to remove remaining unlabeled cells.
3. Remove MS Column from the separator, place it on a new collection tube and elute positive fraction as described above in a small buffer volume (minimum is 500 µL).

Warranty

The products sold hereunder are warranted only to be free from defects in workmanship and material at the time of delivery to the customer. Miltenyi Biotec GmbH makes no warranty or representation, either expressed or implied, with respect to the fitness of a product for a particular purpose. There are no warranties, expressed or implied, which extend beyond the technical specifications of the products. Miltenyi Biotec GmbH's liability is limited to either replacement of the products or refund of the purchase price. Miltenyi Biotec GmbH is not liable for any property damage, personal injury or economic loss caused by the product.

MACS is a registered trademark and autoMACS, MiniMACS, OctoMACS, SuperMACS, and VarioMACS are trademarks of Miltenyi Biotec GmbH.

© 2007 Miltenyi Biotec GmbH.