



Miltenyi Biotec

MACS® Sample Preparation

# Standardize your tissue dissociation and homogenization

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Get viable single-cell suspensions

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Homogenize your tissue sample

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Safely determine  
tissue pathogen load

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Dissociate and discover

# The difference is in the tubes

It's no secret that the success of any experiment depends on the starting material and quality of the preparation. When working with tissue samples, performing effective and reproducible sample preparation using manual methods can be quite a challenge.

Choose gentleMACS™ Tubes for your next experiment and see the difference!

- **Gentle:** Receive viable single-cell suspensions with conserved epitopes for reliable downstream analysis
- **Reproducible:** Automated and standardized tissue processing for user-independent results
- **Rapid:** Faster and easier than conventional manual methods
- **Safe:** Sample processing in a closed and sterile system

Dissociate tissue samples using the **gentleMACS C Tube** to receive high yields of viable single cells with conserved surface epitopes for downstream applications.

Homogenize samples for molecular or microbiology analysis with the **gentleMACS M Tube** to significantly reduce cross-contamination and maximize user safety when working with infectious material.

Read on to learn how gentleMACS Tubes, together with the gentleMACS Dissociators, achieve standardized sample preparation for virtually any tissue type and application!



See the gentleMACS Tubes in action!



C Tube



M Tube

## gentleMACS™ Tubes

See how the gentleMACS C and M Tubes are specially engineered to achieve efficient tissue dissociation or thorough cell homogenization.

See page 4



## gentleMACS™ Dissociators

Discover how you can automate and customize your tissue preparation to your specific sample using our benchtop gentleMACS Instruments.

See page 6



## MACS® Tissue Dissociation Kits

Explore our broad portfolio of easy-to-use kits for gentle yet effective dissociation of numerous tissue types.

See page 7



## Cutting-edge applications

Read how gentleMACS Tubes are a preferred means of tissue sample preparation for a wide variety of applications.

See page 8



# gentleMACS™ Tubes

Patented high-tech tubes for optimal tissue dissociation or homogenization

## gentleMACS™ C or M Tubes

The gentleMACS Tube is a central component of the gentleMACS Dissociator technology. Each element of the tube has been engineered to ensure the highest performance in the dissociation or homogenization of your tissue samples.

### Dedicated tubes for specific applications

- **Tissue dissociation:** Use the purple-cap **C Tube** to get viable single-cell suspensions for cell separation, cell culture, and cell analysis experiments.
- **Tissue homogenization:** Choose the orange-cap **M Tube** to achieve thorough sample homogenization for subsequent molecular and microbiology analysis.

### Process your sample in 3 easy steps

1. Transfer the tissue and buffer into either the gentleMACS C or M Tube, depending on the application, and then insert the gentleMACS Tube cap down into the gentleMACS Dissociator (figure 2).
2. Select a pre-set or custom program from your library. Profile-specific parameters such as rotation direction and speed customize the application. Press Start to begin the run.
3. Remove the gentleMACS Tube from the gentleMACS Dissociator. Transfer the dissociated or homogenized sample, ready for your downstream experiment, by opening the gentleMACS Tube cap or simply pipet through the integrated septum.

### Ordering information

Product	Order no.
gentleMACS C Tubes (25×), sterile, single packed	130-093-237
gentleMACS C Tubes (100×), sterile, 25 tubes per bag	130-096-334
gentleMACS M Tubes (25×), sterile, single packed	130-093-236
gentleMACS M Tubes (100×), sterile, 25 tubes per bag	130-096-335
gentleMACS M Tubes with Strainer (50×), 50 tubes per bag with 600µm mesh strainer	130-094-392



**Figure 1:** gentleMACS C Tubes (purple cap) for tissue dissociation to obtain single-cell suspensions and the gentleMACS M Tubes (orange cap) for tissue homogenization for subsequent molecular and microbiology applications.



**Figure 2:** gentleMACS Tubes processing samples on the gentleMACS Octo Dissociator.



### Tube enclosure – functional design

Our patented enclosure design directs the sample flow towards the stator to ensure thorough dissociation and homogenization.

### Pierceable septum – maximal safety

A pierceable septum allows for the removal of dissociated or homogenized tissue sample without the need to open the tube. This keeps hazardous material safely away from the operator.

### Stator – exact control

At the fixed stator site, the sample is processed through mechanical shearing that occurs within the narrow gaps defined by the distance between the stator teeth and the rotor.

### Sealing gasket – no loss of material

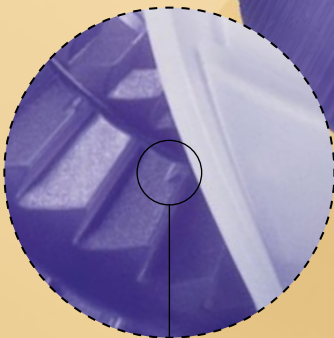
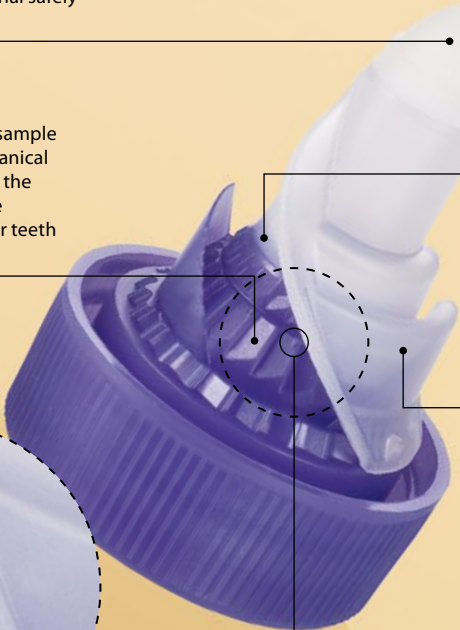
A sealing gasket within the cap achieves the near impossible. At incredible rotation speeds and elevated temperatures, you experience no sample loss.

### Rotor – precision crafted

A rotating paddle draws the sample into the stator for processing and provides the exact amount of sheer force necessary to gently pull cells from tissues or intact molecules from within cells.

### Spacers – that make the difference

The stator teeth of the gentleMACS C Tubes are equipped with spacers that define a specific distance between the rotor and the stator. This distance ensures efficient extraction of viable single cells from tissue samples. The M Tubes lack spacers, which makes them perfectly suited for tissue homogenization for molecular and microbiology applications.



# gentleMACS™ Dissociators

Get a good start with standardized tissue dissociation or homogenization

## The gentleMACS™ Dissociator

The gentleMACS Dissociator provides reliable tissue dissociation and thorough homogenization – a prerequisite for your cell and molecular research.

Benefit from more than 30 pre-defined programs for the most frequently used tissues. Process two samples in parallel to save time.

### Get viable single cells from:

- Tumor tissue
- Spleen, lung, intestine, and liver
- Heart and skeletal muscle
- Neural tissue
- Embryoid bodies and more

### Or homogenize your tissue for:

- DNA/RNA isolation from fresh or frozen samples
- Protein extraction
- Organelle extraction
- Determination of pathogen load



Figure 3: The gentleMACS Dissociator for standardized tissue dissociation.

### Ordering information

Product	Order no.
gentleMACS Dissociator	130-093-235
gentleMACS Octo Dissociator	130-095-937
gentleMACS Octo Dissociator with Heaters	130-096-427

## The gentleMACS™ Octo Dissociator

The gentleMACS Octo Dissociator extends the basic features of the gentleMACS Dissociator for maximum convenience, flexibility, and efficiency.

### High throughput for faster results

The gentleMACS Octo Dissociator can process up to eight samples either in parallel or sequentially.

### Independent sample operation

Different tissue types can be processed simultaneously. For unbeatable convenience you can add new samples at any time, even if other dissociation programs are in progress.

### Customize your program to fit your experiment

More than 30 pre-defined programs are available for the most frequently used tissue types. With the gentleMACS Octo Dissociator, you can also set up customized programs for your specific samples and applications.

### Integrated heaters for on-instrument enzymatic incubation

The optional Heaters enable enzyme incubation directly on the instrument for walk-away tissue dissociation with enzymatic digestion.



Figure 4: The gentleMACS Octo Dissociator with Heaters for processing up to eight samples in parallel or sequentially.

# MACS® Tissue Dissociation Kits

Preserve cell integrity and surface epitopes with optimized enzyme mixes

## MACS® Tissue Dissociation Kits

### Broad selection, easy-to-use kit format

MACS Tissue Dissociation Kits allow for gentle, yet effective, dissociation of a wide range of tissue types. The convenient kit format provides pre-defined enzyme solutions for optimal results.

Use MACS Tissue Dissociation Kits together with the innovative gentleMACS C Tubes and gentleMACS™ Dissociators to enjoy high yields of cells with preserved epitope integrity, ready for use in downstream applications.

- **Gentle:** Preserves membrane integrity and surface epitopes
- **Fast:** Get quality single-cell suspensions in less time
- **Reproducible:** Standardized procedures for user-independent results



Figure 5: MACS Tissue Dissociation Kit, including buffers and enzyme solutions.

### Ordering information

Product	Number of reactions	Order no.
Adipose Tissue Dissociation Kit, mouse and rat	50	130-105-808
Adult Brain Dissociation Kit, mouse and rat	50	130-107-677
Brain Tumor Dissociation Kit (P), human	25	130-095-942
Brain Tumor Dissociation Kit (T), human	25	130-095-939
Embryoid Body Dissociation Kit, human and mouse	50	130-096-348
Epidermis Dissociation Kit, human	100	130-103-464
Epidermis Dissociation Kit, mouse	25	130-095-928
Lamina Propria Dissociation Kit, mouse	50	130-097-410
Liver Dissociation Kit, mouse	25	130-105-807
Lung Dissociation Kit, mouse	50	130-095-927
Mitochondria Extraction Kit – Tissue	25	130-097-340
Neonatal Heart Dissociation Kit, mouse and rat	25	130-098-373
Neural Tissue Dissociation Kit (P)	50	130-092-628
Neural Tissue Dissociation Kit (T)	50	130-093-231
Neural Tissue Dissociation Kit – Postnatal Neurons	50	130-094-802
Neurospheres Dissociation Kit (P)*	100	130-095-943
Neurospheres Dissociation Kit (T)*	100	130-095-944
Skeletal Muscle Dissociation Kit, mouse and rat	50	130-098-305
Spleen Dissociation Kit, mouse	50	130-095-926
Tumor Dissociation Kit, human	25	130-095-929
Tumor Dissociation Kit, mouse	50	130-096-730
Umbilical Cord Dissociation Kit, human	25	130-105-737
Whole Skin Dissociation Kit, human	50	130-101-540

\* Not for use with gentleMACS Dissociators



# Unlimited number of applications

MACS® Sample Preparation for a wide variety of downstream analyses

## Cutting-edge applications

### Single-cell suspensions from tissue

Tissue dissociation with the gentleMACS™ Dissociators and Tubes is gentle to cells to yield single-cell suspensions with a high viability rate. Choose from a broad portfolio of Tissue Dissociation Kits, gentleMACS programs, and protocols to process virtually any tissue type.

### Molecular analysis of tissue samples

Thorough homogenization is required to efficiently extract sub-cellular material such as total RNA, DNA, proteins, and organelles from diverse sample materials. The gentleMACS Dissociators offer optimized programs for virtually any tissue type.

### Determination of tissue pathogen load

Determining bacterial, parasite, and viral loads in tissue samples can be quite a challenge, especially due to the hazardous nature of the sample material and the risk of cross-contamination. The gentleMACS Tube is a closed system that reduces hazards of handling to the operator.

### Sample preparation for residue analysis

Successful residue analysis experiments require complete homogenization of sample material. The gentleMACS M Tubes provide effective sample homogenization suitable for a variety of sensitive downstream applications such as mass spectrometry and HPLC analysis.

For a comprehensive list of the protocols, dissociation kits, datasheets, and manuals for the MACS® Sample Preparation portfolio visit:

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

## Benefits

**Gentle:** Receive viable single-cell suspensions with conserved epitopes for reliable downstream analysis

**Reproducible:** Automated and standardized tissue processing for user-independent results

**Rapid:** Faster and easier than conventional manual methods

**Safe:** Sample processing in a closed and sterile system



**Figure 6:** The gentleMACS Dissociators are the first step in the total MACS® Solution – a comprehensive workflow to support each phase of your research.



# MACS® Solutions

From sample preparation to sophisticated analyses

## MACS® Sample Preparation

The quality of your results strictly depends on the sample preparation. Miltenyi Biotec offers innovative instruments and reagents for fast and gentle tissue dissociation and homogenization.

► [miltenyibiotec.com/samplepreparation](http://miltenyibiotec.com/samplepreparation)



## MACS Cell Separation

A large panel of MACS MicroBeads and Cell Isolation Kits is available for the isolation of any cell type. The cells can be separated manually or in an automated fashion. The autoMACS® Pro Separator has been designed for automated walk-away cell sorting of multiple samples.

► [miltenyibiotec.com/cellseparation](http://miltenyibiotec.com/cellseparation)



## MACS Flow Cytometry

Miltenyi Biotec provides a large panel of antibodies for a wide range of research. The innovative MACSQuant® Analyzer is an extremely compact, easy-to-use, multicolor benchtop flow cytometers. The instruments are fully automated and enable absolute cell count.

► [miltenyibiotec.com/flowcytometry](http://miltenyibiotec.com/flowcytometry)



## MACS Cell Culture

The product portfolio for cell culture includes specially developed media, reagents for cell activation, and a multitude of cytokines and growth factors for many research applications.

► [miltenyibiotec.com/cellculture](http://miltenyibiotec.com/cellculture)



## MACSmolecular

Miltenyi Biotec provides products for analytical protein isolation and detection, gene expression analysis, microRNA analysis, and microarray technologies and instrumentation.

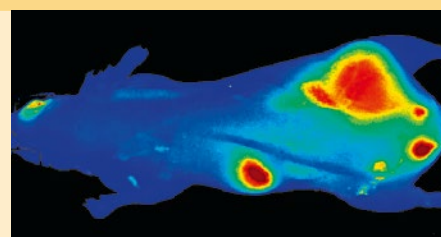
► [miltenyibiotec.com/molecular](http://miltenyibiotec.com/molecular)



## Viscover™ Imaging Agents

Be at the forefront of tumor monitoring with Viscover™ Imaging Agents. These represent the first and only integrated range of *in vivo* contrast agents for pre-clinical imaging in small animals. These unique agents use the modalities MRI, CT, optical imaging, and ultrasound.

► [miltenyibiotec.com/viscover](http://miltenyibiotec.com/viscover)



For a comprehensive list of the protocols, dissociation kits, datasheets, and manuals for the MACS® Sample Preparation portfolio visit:

► [miltenyibiotec.com/samplepreparation](http://miltenyibiotec.com/samplepreparation)



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