T cell research
The complete product portfolio
Advance your T cell research

Whatever your T cell research interest, our tools and products can support you throughout every step of your workflow. From sample preparation to cell isolation and cell culture to analysis.

With our gentle sample preparation solutions you can obtain viable single-cell suspensions from any tissue to commence your T cell research. The MACS® Cell Separation portfolio enables you to choose the cell isolation option that is best for your specific requirements, allowing you to select your T cell subset of choice. Optimized cell culture products offer you the best conditions for your T cells. Finally, our large antibody portfolio and innovative flow cytometry solutions ensure you precise analysis.

We want to collaborate with you. Benefit from our full range of instruments and reagents as well our expertise and trusted support in any T cell matter. Optimize your experimental workflows and target your next publication.
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Start smart

Our sample preparation portfolio offers gentle and versatile tissue dissociation, allowing for standardized and reproducible results. With our gentleMACS™ Dissociators, process samples into viable, single-cell suspensions. The preservation of cell surface epitopes ensure reliability for downstream T cell applications.
The secret to success lies in your starting material

gentleMACS™ Dissociators
Our versatile benchtop tissue dissociators can process up to eight samples in parallel. Automated, programmable and with optional temperature regulation to ensure the highest reproducibility.

MACS® Tissue Dissociation Kits
Combine the gentleMACS Instrument’s mechanical dissociation with enzymatic treatment for excellent yield, high viability, and preserved cell epitopes. Reproducible T cell isolation even from difficult to process human and mouse tissues.

gentleMACS Tubes
Our gentleMACS™ C Tubes are optimized for use with gentleMACS Dissociators to guarantee the highest quality tissue dissociation or homogenization.

Watch our video to learn about the gentle, rapid, and effective generation of single-cell suspensions from human formalin-fixed paraffin-embedded (FFPE) carcinoma sections.
► miltenyibiotec.com/DissociateFFPE
Select the best

The MACS® Cell Separation portfolio offers you the freedom to choose the cell isolation method that is best suited to your specific requirements. Our proven magnetic cell separation technology is continuously expanding to offer new and innovative options across basic and clinical research.

Versatile
Reliable isolation of functional T cells from a variety of starting materials

Unique
Proven column technology yields positive and negative fractions with high purity that are directly available for downstream applications

Diverse
Choose the cell isolation option that is best for your specific requirements
**T cell isolation with MACS® Technology**

**autoMACS® Pro Separator**
A fully automated benchtop separator for magnetic cell sorting of multiple samples.

- Automated, walk-away cell labeling and isolation for up to six samples
- Standardized cell separation for reproducible, user-independent results
- Fast and gentle isolation of virtually any cell type
- Chilled sample processing

**MultiMACS™ Cell24 Separator Plus**
Efficient, semi-automatic cell isolation of up to 24 samples simultaneously.

- **Time-saving**: Up to 24 separations in parallel
- **User-friendly**: Easy to operate with intuitive touchscreen interface
- **Adaptable**: Use with single columns or column blocks

<table>
<thead>
<tr>
<th>Columns</th>
<th>MiniMACS™ Separator</th>
<th>OctoMACS™ Separator</th>
<th>MidiMACS™ Separator</th>
<th>QuadroMACS™ Separator</th>
<th>MACSxpress® Separator</th>
<th>autoMACS® Pro Separator</th>
<th>MultiMACS™ Cell24 Separator Plus</th>
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<tbody>
<tr>
<td><strong>Capacity, number of total cells</strong></td>
<td>MS: 2×10⁸ Large Cell: 2×10⁸</td>
<td>MS: 2×10⁸ Large Cell: 2×10⁸</td>
<td>LS: 2×10⁸ LD: 5×10⁸ Whole blood: up to 15 mL blood</td>
<td>LS: 2×10⁸ LD: 5×10⁸ Whole blood: up to 15 mL blood</td>
<td>Up to 30 mL whole blood</td>
<td>4×10⁹ cells or 15 mL whole blood</td>
<td>Multi-24 Column Block: 1×10⁹ LS: 2×10⁸ LD: 5×10⁸ Whole blood columns: 10 mL whole blood</td>
</tr>
<tr>
<td><strong>Columns</strong></td>
<td>MS Columns, Large Cell Columns</td>
<td>MS Columns, Large Cell Columns</td>
<td>LS Columns, LD Columns, Whole Blood Columns</td>
<td>LS Columns, LD Columns, Whole Blood Columns</td>
<td>n/a</td>
<td>autoMACS Columns</td>
<td>Multi-24 Column Block, LS Columns*, LD Columns*, Whole Blood Columns*</td>
</tr>
</tbody>
</table>

| Capacity, number of labeled cells | MS: 1×10⁷ Large Cell: 1×10⁷ | MS: 1×10⁷ Large Cell: 1×10⁷ | LS: 1×10⁷ LD: 1×10⁷ | LS: 1×10⁷ LD: 1×10⁷ | n/a | 2×10⁷ cells | LS: 1×10⁷ LD: 1×10⁷ Multi-24 Column Block: 1×10⁷ |

*with Single-Column Adapter

**Table 1**: An overview of MACS Separators and Columns.
Isolate virtually any T cell subset

Isolate T cell subsets from human, mouse, rat, and non-human primate samples. Choose from our extensive portfolio for the isolation of virtually any T cell subset. You can find our available portfolio of products on pages 24–26.

MACS® MicroBeads and MicroBead Kits

Straightforward positive selection of your T cell subset of choice directly via the respective markers making it ideal for rare cells and single cell suspensions. Highest purity and recovery as simple as it gets.

- Minimal cell labeling – no cell activation
- Ideal for rare cells, challenging samples and tissue single cell suspensions
- Proven technology for basic research and clinical application

MACS® T Cell Isolation Kits

Remove any unwanted cells from the target population by depletion when untouched cell separation or subsequent magnetic sorting steps are required. Ideal for PBMC samples and mouse spleen single cell suspensions.

- Untouched selection by depletion of non-target cells
- Ideal for pre-enrichments (e.g. CD4+ cell isolation prior to flow sorting of Treg cells)

Figure 1: Enrichment of CD8+ T cells from human PBMCs using CD8 MicroBeads, human. Cells were stained with CD8-PE and CD56-FITC and analyzed using the MACSQuant Analyzer.

Figure 2: Untouched isolation of CD4+ T cells from a mouse spleen using the CD4+ T Cell Isolation Kit, mouse. The spleen single-cell suspension was prepared with the gentleMACS Dissociator. Cells were stained with CD4-APC and CD3ε-PE antibodies and analyzed using the MACSQuant Analyzer.

Learn more about the principle of our MACS® Technology:

milenyibiotech.com/MACScellsep
Truly hands-free operation
Integration with liquid handling systems
The MACSQuant X was built on the premise of delivering a cytometer robust enough to process thousands of samples in a day. For that reason, it can be seamlessly integrated into a variety of robotic liquid handling systems, giving you access to unprecedented levels of automation.
Isolate T cells directly from whole blood and blood products

**StraightFrom® MicroBeads**
Positive selection of pan T cells, CD4$^+$ or CD8$^+$ cell subsets without density gradient centrifugation. Effortless, simple, and automatable.

- Highly pure cells straight from whole blood, buffy coat, LRSC, and Leukopak®
- No density gradient centrifugation or erythrocyte lysis needed
- Easy and fast protocols – process a full buffy coat or half Leukopak in only 30 minutes

**MACSxpress® Isolation Kits**
Fast and easy untouched isolation of pan T cells and several subsets directly from human whole blood, buffy coat or LRSC.

- Obtain pure cells in only 25 minutes
- No density gradient centrifugation
- Column-free system

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**Figure 3:** Separation of CD3$^+$ T cells from whole blood using StraightFrom Whole Blood CD3 MicroBeads, human and the MultiMACS Cell24 Separator.

**Figure 4:** CD4$^+$ T cells were isolated from whole blood using the MACSxpress Whole Blood CD4 T Cell Isolation Kit, MACSmix Tube Rotator, and MACSxpress Separator.
The principle of MACSxpress® Technology

Add reconstituted MACSxpress® Cell Isolation Cocktail to sample.

Incubate sample for 5 minutes at room temperature using the MACSmix™ Tube Rotator.

Place open tube in the magnetic field of the MACSxpress Separator for 15 minutes.

Collect the supernatant containing the target cells. Unwanted cells are retained at the tube wall while erythrocytes are sedimented at the bottom.

Figure 5: Principle of MACSxpress Technology. Isolation of cells directly from blood and blood products in only 25 minutes.

Watch our video to learn how to skip density centrifugation: miltenyibiotec.com/StraightFromMB
Label-free T cell isolation with REAlease® Technology

Isolate label-free pan T cells and subsets from a variety of human and mouse starting materials. REAlease® Technology allows for magnetic cell isolation with subsequent removal of any beads and labels from your cells of interest. Enriched cells are then suitable for magnetic re-labeling and any application where label-free cells are essential.

**REAlease® MicroBeads**
- Bead-free cells suited for a second round of positive selection
- Label-free cells for any downstream application
- Recombinant antibody fragments for reproducible results

**Figure 6**: The basic principle of REAlease MicroBeads for reversible cell labeling.

Want to learn more? Watch this short video to learn the basics of reversible cell labeling using REAlease MicroBeads.

[Video](miltenybiotec.com/REAleaseMB)
Culture is key

Consistent, high-quality products are essential for reliable and valid results. At Miltenyi Biotec, we offer an extensive T cell culture portfolio including specialized media, recombinant cytokines and growth factors, as well polyclonal and antigen-specific activation reagents.

Entire workflow
Optimized cell culture reagents to support complete experimental workflows

Standardization
Reproducible and reliable results are key for success

Cell therapy
Products are available up to MACS® GMP grade
Optimal T cell culture conditions

**TexMACS™ Medium**
Optimized cell culture media developed for high-performance cultivation of human and mouse T cells. Achieve optimal cell growth, high expansion rates, and reliable activation – even without serum.

**MACS® Premium-Grade Cytokines**
Designed for demanding cell culture applications in all areas of T cell research. Save time and costs whilst achieving consistent results.

- **Reproducible results:** lot-specific activity in IU and highest quality testing using WHO standards
- **Save time and costs:** no lot-to-lot testing required, efficient dosage without oversaturation
- **Easy translation:** low endotoxin levels, high purity and available up to MACS® GMP grade for all relevant pre-clinical studies

**T cell differentiation**
Our portfolio offers a large range of T cell-relevant cytokines, growth factors and functional-grade antibodies to provide the best tools for your T cell differentiation.

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**CytoBox – Differentiation of mouse T helper cells**
All-in-one kit with everything you need for efficient Th1, Th2, and Th17 differentiation of mouse naive CD4+ T cells, including cytokines and functional-grade antibodies.

> miltenyibiotec.com/cytobox

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**Figure 7:** Differentiation and activation of CD4+ T cell subsets.
Efficient T cell activation and expansion

T cell activation and expansion kits
MACSiBead™ particles loaded with functional antibodies resemble antigen-presenting cells, mimicking cell-mediated T cell stimulation and expansion.

- Highly efficient and homogenous polyclonal T cell stimulation for optimal expansion
- Flexible loading with antibodies of your choice
- Specific kits for human and mouse T cells and Treg cells

**Figure 8:** Expansion of human and mouse CD4⁺ and CD8⁺ T cells using the respective T Cell Activation/Expansion Kit.

**Figure 9:** Activation and expansion of human CD4⁺ and CD8⁺ T cells using T Cell TransAct and TexMACS Medium. T cells were isolated using the Pan T Cell Isolation Kit, human, cultured in TexMACS Medium containing MACS Premium-Grade Cytokine IL-2 and stimulated with T Cell TransAct. After 48 hours of activation, CD25 and CD69 activation marker expression was analyzed using the MACSQuant Analyzer.

**Figure 10:** T cells activated with T Cell TransAct, human showed a strong proliferation during 14 days of culture. Proliferation was measured using the cell division tracker CFSE.

T Cell TransAct™
T Cell TransAct™ is an innovative colloidal, polymeric nanomatrix, conjugated to humanized, recombinant CD3 and CD28 agonists for physiological T cell activation and expansion.
T Cell TransAct™
The next generation T cell activation reagent

Practical application
• Volumetric dosage
• Ready-to-use
• Removal by simple wash step

Robust stimulation
• Effector phenotype
• Highest cell viability
• Physiological and stable stimulation

Convenient compatibility
• Available for research and GMP workflows
• Optimized for CAR T production on the CliniMACS Prodigy®
• Can be sterile filtered

Can’t get enough of your T cells?
Watch the video to learn more:
miitenyibiotec.com/TCellTransAct
Antigen-specific and polyclonal T cell stimulation

PepTivator® Peptide Pools
Effective stimulation of antigen-specific T cells is achieved consistently with PepTivator® Peptide Pools. These extensive panels of virus-, tumor-, microbiota-, and auto-antigen-specific antigens consists of 15-mer peptides with 11-amino-acid overlaps, covering the complete sequence of the respective antigen.

- Fast and efficient antigen-specific stimulation of CD4⁺ and CD8⁺ T cells
- Pulsing of antigen-presenting cells such as dendritic cells
- Water soluble and no need for toxic DMSO
- In a convenient 96-well format
- Available up to MACS® GMP grade

Functional-grade antibodies
Our functional-grade antibodies can be used for activation, neutralizing or blocking studies, both in vitro or in vivo. Mimic or inhibit ligand-receptor interactions for the activation and expansion of human and mouse T cells. Obtain reliable results from high quality antibodies.

- Free of preservatives, sterile filtered, with low endotoxin content
- Suited for activation, neutralization, or blocking assays
- Pure (e.g. CD3 pure, CD28 pure) or biotinylated
- Available up to MACS GMP grade

Figure 11: Production of IFN-γ by human CD4⁺ or CD8⁺ T cells after stimulation with different antigens using PepTivator Peptide Pools.

Figure 12: Restimulation of human PBMCs with and without PepTivator CMV pp65 – premium grade. For flow cytometry analysis cells were subsequently stained with anti-IFN-γ-PE (intracellular cytokine staining) and counterstained for CD4 and CD8 expression.
CytoStim™

The non-toxic alternative to the superantigen SEB, CytoStim™, has been developed for rapid and effective restimulation of effector and memory T cells. It works by cross-linking the T cell receptor to the antigen-presenting cell of the major histocompatibility complex (MHC) molecule. Alike SEB, it results in rapid cytokine expression upon stimulation and is consequently suited as a positive control for T cell stimulation experiments.

- Rapid cytokine expression and upregulation of activation markers by target cells
- Antibody-based, non-toxic alternative to SEB
- Suitable for CD4+ and CD8+ T cells in fresh PBMCs, whole blood, or other single cell suspensions

Figure 13: PBMCs were isolated via density gradient centrifugation and stimulated with the CytoStim Reagent, SEB, or PMA/Ionomycin (positive control) for comparison of T cell activation. Responding T cells were analyzed according to their expression of CD4 and CD8, activation marker CD154 and secretion of IFN-γ using the MACSQuant Analyzer. CytoStim activated cells show higher expression of activation marker CD154, while the expression of IFN-γ is similar compared to cells stimulated with SEB.
Join the flow revolution

The flow cytometry and cell sorting portfolio offers the best-in-class solutions for all of your T cell research needs. Our flow analysis tools lead you one step closer to reliable and reproducible results every time.
Flow cytometry and cell sorting solutions to power your T cell research

MACSQuant® Flow Cytometers
Fully automated, reliable high-throughput screening for sensitive, multiparameter cell analysis.

- **MACSQuant® Analyzer 10**: Three lasers (blue, violet, red) and ten optical parameters
- **MACSQuant Analyzer 16**: Expanded fluorescent channels with 16 optical parameters
- **MACSQuant VYB**: Unique variant with a yellow laser for optimized detection of “fruit” fluorescent proteins
- **MACSQuant X**: Compact flow cytometer for fast and reliable processing of 96- and 384-well plates

MACSQuant® Tyto® Cell Sorter
Revolutionary cell sorting based on microchip technology for high-speed, multiparameter flow sorting.

- Gentle to cells: Microchip-based sorting process
- Safe: Closed and sterile cartridge system, no contamination or sample carry over, no internal fluidics
- Flow sorting based on up to 10 parameters
- Benchtop instrument
- MACS® GMP consumables for simple transfer from RUO to GMP protocols

Learn more about our MACSQuant® Instruments:
[Visit](milenyibiotech.com/TCellFlow)
Enhance your T cell analysis

Flow cytometry is the method of choice to monitor phenotype, plasticity and functionality of T cells. Our portfolio of flow cytometry products provides high quality reagents and instruments to support quick, easy and standardized multi-parameter T cell analysis generating reliable and consistent data.

8-Color Immunophenotyping Kit
Simplified immunophenotyping of PBMCs, whole blood, lysed whole blood, and other single-cell suspensions from tissue.
- Reliable and reproducible analysis of multiple leukocyte subsets
- Ready-to-use antibody cocktail with optimized concentrations
- Fully automated measurement and analysis via Express Mode with MACSQuant® Analyzers

Rapid Cytokine Inspector Kits
Our Rapid Cytokine Inspector Kits are optimized for fast, high-throughput, multi-parameter analysis of activated cytokine secreting human T cells. These all-in-one kits combine extracellular marker staining with intracellular cytokine detection.
- High-throughput multi-parameter analysis of antigen-specific T cells
- Rapid identification and enumeration of cytokine-producing activated antigen-specific CD4+ and CD8+ T cells
- Immunomonitoring of antigen-specific T cells

<table>
<thead>
<tr>
<th>Fluorochrome</th>
<th>CD4/CD8 T Cell Detection Cocktail</th>
<th>CD4 T Cell Detection Cocktail</th>
<th>CD8 T Cell Detection Cocktail</th>
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</thead>
<tbody>
<tr>
<td>VioBlue®</td>
<td>CD3</td>
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<td>CD3</td>
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<tr>
<td>FITC</td>
<td>CD8</td>
<td>CD154</td>
<td>CD8</td>
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<td>PE</td>
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<tr>
<td>PerCP</td>
<td>CD14/CD20</td>
<td>CD14/CD20</td>
<td>CD14/CD20</td>
</tr>
<tr>
<td>APC</td>
<td>CD4</td>
<td>CD4</td>
<td>Cytokine 2</td>
</tr>
<tr>
<td>FcR-Block</td>
<td>FcR-Block</td>
<td>FcR-Block</td>
<td>FcR-Block</td>
</tr>
</tbody>
</table>

Table 2: Rapid Cytokine Inspector Kits combine extracellular marker staining with intracellular cytokine detection and contain everything you need for staining antigen-activated T cells. Choose the appropriate anti-cytokine antibody (e.g. IL-2, IL-17, IFN-γ, TNF-α; not provided with the kit) and start your experiment.

Figure 14: Whole blood staining with the 8-Color Immunophenotyping Kit, human and flow cytometry cell analysis using the MACSQuant Analyzer 10. A gate around viable cells was set for elimination of doublets (A). Monocytes were differentiated based on their CD14 expression and further divided into classical, intermediate, and non-classical monocytes via CD16 (B). CD3 and CD56 were used to distinguish CD56+ NK cells, CD3+ T cells and a CD3+ CD56+ T cell population (C). The CD3+ T cells were divided into CD4+ and CD8+ T cells (D).
MACS® Cytokine Secretion Assays
Developed for detection and enrichment of viable cytokine-secreting T cell subsets. Detection of one T cell in a million cells.

- Isolation of viable cytokine-secreting T cells
- Accurate analysis of cytokine secretion at single-cell level
- Ideal for the analysis of rare antigen-specific T cell populations
- Isolation of T cell subsets such as Th1 (IFN-γ), Th2 (IL-4), Th17 (IL-17), and IL-10-secreting Tr1 (IL-1) cells

MACSPlex Cytokine Kits
Determine multiple soluble analytes in a single human or mouse sample using a standard flow cytometer.

- True multiplexing
- Up to 12 human or 10 mouse cytokines in one sample
- Optimized for automated measurement using the MACSQuant® Analyzer’s Express Mode
- Dedicated kits available for analysis of exosomes, cytotoxicity and effector functions

Recombinantly generated
For highest purity and lot-lot consistency

One universal IgG1 isotype
Made to reduce complexity of experiment planning

Figure 15: Principle of the Cytokine Secretion Assays.
**Human T cells**

**Separation reagents**

### Activated T cells
- **CD4+ T cells**
  - CD25 MicroBeads II # 130-092-983
  - CD3 MicroBeads # 130-050-101
  - REAlease CD3 MicroBead Kit # 130-117-038
  - CD6 MicroBeads # 130-091-264
  - CD28 MicroBead Kit # 130-093-247
  - MACSxpress Whole Blood Pan T Cell Isolation Kit, human # 130-120-001
  - StraightFrom* Whole Blood CD3 MicroBeads # 130-090-874

- **T cells**
  - MACSxpress Buffy Coat Pan T Cell Isolation Kit, human # 130-120-001
  - StraightFrom* Buffy Coat CD3 MicroBead Kit, human # 130-121-310

### Treg cells
- CD25 MicroBeads II # 130-092-983
  - REAlease CD4 MicroBead Kit # 130-050-101
  - CD4 MicroBeads # 130-051-401
  - CD69 MicroBead Kit II # 130-092-355
  - CD154 MicroBead Kit # 130-092-658
  - CD137 MicroBead Kit # 130-093-476
  - CD3 MicroBeads # 130-050-101

### TCRγ/δ T cells
- Anti-TCRγ/δ MicroBead Kit # 130-093-247

### CD8+ T cells
- CD8 MicroBeads # 130-090-878
  - StraightFrom Whole Blood MicroBeads # 130-090-878
  - StraightFrom Buffy Coat CD8 MicroBead Kit # 130-090-878

### NKT cells
- Anti-iNKT MicroBeads # 130-094-842

### Tumor-infiltrating leukocytes (TIL)
- REAlease CD4 (TIL) MicroBead Kit, human, # 130-121-559

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**DN T cells**

- Double-negative T Cell Isolation Kit # 130-092-614

**Naive Pan T cells**

- Naive Pan T Cell Isolation Kit # 130-097-095
**CD4⁺ T cell subsets**

- **Naive CD4⁺ T cells**
  - Naive CD4⁺ T Cell Isolation Kit II
    - # 130-094-131
  - Pre-selection with:
    - CD4⁺ T Cell Isolation Kit
      - # 130-096-533
    - CD62L MicroBeads
      - # 130-091-758
  - REAlease® CD62L MicroBead Kit, human
    - # 130-124-203
  - CD45RA MicroBeads
    - # 130-045-901
  - CD45RO MicroBeads
    - # 130-046-001

- **Skin-homing T cells**
  - Anti-CLA MicroBead Kit
    - # 130-092-464
  - CD4⁺CLA⁺ T Cell Isolation Kit
    - # 130-092-435

- **Memory CD4⁺ T cells**
  - Memory CD4⁺ T Cell Isolation Kit
    - # 130-091-893
  - MACSxpresa® Whole Blood CD4 Memory T Cell Isolation Kit, human
    - # 130-106-770

- **Tem cells**
  - CD4⁺ Effector Memory T Cell Isolation Kit
    - # 130-094-125

- **Tcm**
  - CD4⁺ Central Memory T Cell Isolation Kit
    - # 130-094-302

- **Tn1 cells**
  - IFN-γ Secretion Assay – Cell Enrichment and Detection Kit (PE)
    - # 130-054-201

- **Tn2 cells**
  - CD294 (CRTH2) MicroBead Kit
    - # 130-091-274
  - IL-4 Secretion Assay – Cell Enrichment and Detection Kit (PE)
    - # 130-054-101

- **Tn17 cells**
  - IL-17 Secretion Assay – Cell Enrichment and Detection Kit (PE)
    - # 130-094-542

- **Tn22 cells**
  - IL-22 Secretion Assay – Cell Enrichment and Detection Kit (PE)
    - # 130-108-274

**CD8⁺ T cell subsets**

- **Naive CD8⁺ T cells**
  - Naive CD8⁺ T Cell Isolation Kit
    - # 130-093-244
  - Pre-selection with:
    - CD8⁺ T Cell Isolation Kit
      - # 130-096-495
    - CD45RA MicroBeads
      - # 130-045-901
    - CD45RO MicroBeads
      - # 130-046-001

- **Memory CD8⁺ T cells**
  - CD8⁺ Memory T Cell Isolation Kit
    - # 130-094-412

- **Temra**
  - CD8⁺CD45RA⁺ Effector T Cell Isolation Kit
    - # 130-094-485

- **Cytotoxic T cells**
  - CD8⁺CD57⁺ T Cell Isolation Kit
    - # 130-093-396

- **Effector T cells**
  - Pre-selection of CD8⁺ T cells with:
    - CD8⁺ T Cell Isolation Kit
      - # 130-096-495
    - CD27 MicroBeads
      - # 130-051-601

**Color code for the use of MACS⁺ Cell Separation products**

- Positive selection (labeling of target cells)
- Positive selection of cells directly from blood products
- Sequential separation (combination of depletion of non-target cells and positive selection)
- Depletion (labeling for removal of an unwanted cell type)
- Isolation of untouched cells using a depletion cocktail

**Legend**

- DN T cell: Double-negative T cell
- iNKT: Invariant natural killer T cell
- NK cell: Natural killer T cell
- RTE: Recent thymic emigrant
- Tem: Central memory T cell
- Temra: Effector memory CD45RA⁺ T cell
- Tn cell: T helper cell
- Treg cell: Regulatory T cell
- Tcr: T cell receptor

For rat and non-human primate cell isolation products, visit [www.miltenyibiotec.com/cellseparation](http://www.miltenyibiotec.com/cellseparation)

Our T cell separation portfolio is continuously growing. Please check our website for new products and updates.
# Mouse T cells

**Separation reagents**

For rat and non-human primate cell isolation products, visit [www.miltenyibiotec.com/cellseparation](http://www.miltenyibiotec.com/cellseparation)

Our T cell separation portfolio is continuously growing. Please check our website for new products and updates.

### T cells
- **CD3ε MicroBead Kit**
  - # 130-094-973
- **CD90.1 MicroBeads**
  - # 130-121-273
- **CD90.2 MicroBeads**
  - # 130-121-278

### CD4+ T cells
- **CD4 (Ly-1) MicroBeads**
  - # 130-049-301
- **Pan T Cell Isolation Kit II**
  - # 130-095-130

### Naive CD4+ T cells
- **Naive CD4+ T Cell Isolation Kit**
  - # 130-104-453
- **CD4+CD62L+ T Cell Isolation Kit**
  - # 130-106-643

### Treg cells
- **CD4+CD25+ Regulatory T Cell Isolation Kit**
  - # 130-117-043

### CD8+ T cells
- **CD8a (Ly-2) MicroBeads**
  - # 130-091-072
- **CD62L (L-selectin) MicroBeads**
  - # 130-049-701

### Naive CD8a+ T cells
- **Naive CD8a+ T Cell Isolation Kit**
  - # 130-096-543

### Memory T cells

#### Pre-selection with:
- **CD4+ or CD8+ T Cell Isolation Kit**
  - # 130-104-454 (CD4)
  - # 130-104-075 (CD8)
- **CD62L (L-selectin) MicroBeads**
  - # 130-049-701

### Activated T cells
- **CD25 MicroBead Kit**
  - # 130-091-072
- **CD154 Enrichment and Detection Kit (PE)**
  - # 130-093-129

### Tumor-infiltrating leukocytes (TIL)
- **CD4 (TIL) MicroBeads**
  - # 130-116-475
- **CD8 (TIL) MicroBeads**
  - # 130-116-478
- **CD4/CD8 (TIL) MicroBeads**
  - # 130-116-480
- **CD45 (TIL) MicroBeads**
  - # 130-110-618

For complete information, see [www.miltenyibiotec.com/cellseparation](http://www.miltenyibiotec.com/cellseparation)
Visit our webpage for our complete T cell product portfolio and scientific resources

- Webinars
- Videos
- Protocols and workflows
- Application notes
- Posters
- and more …

▶ miltenyibiotec.com/tcells