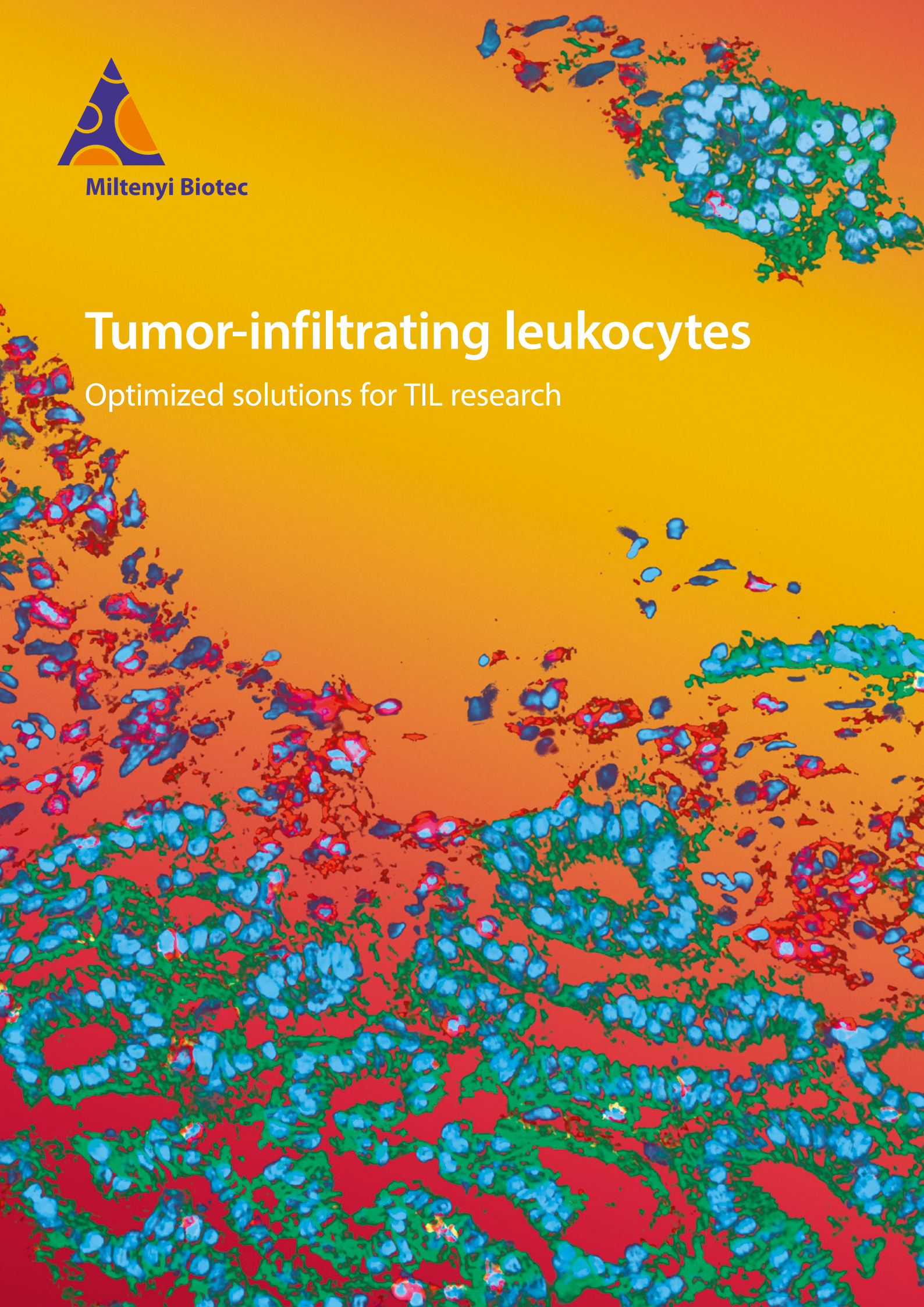




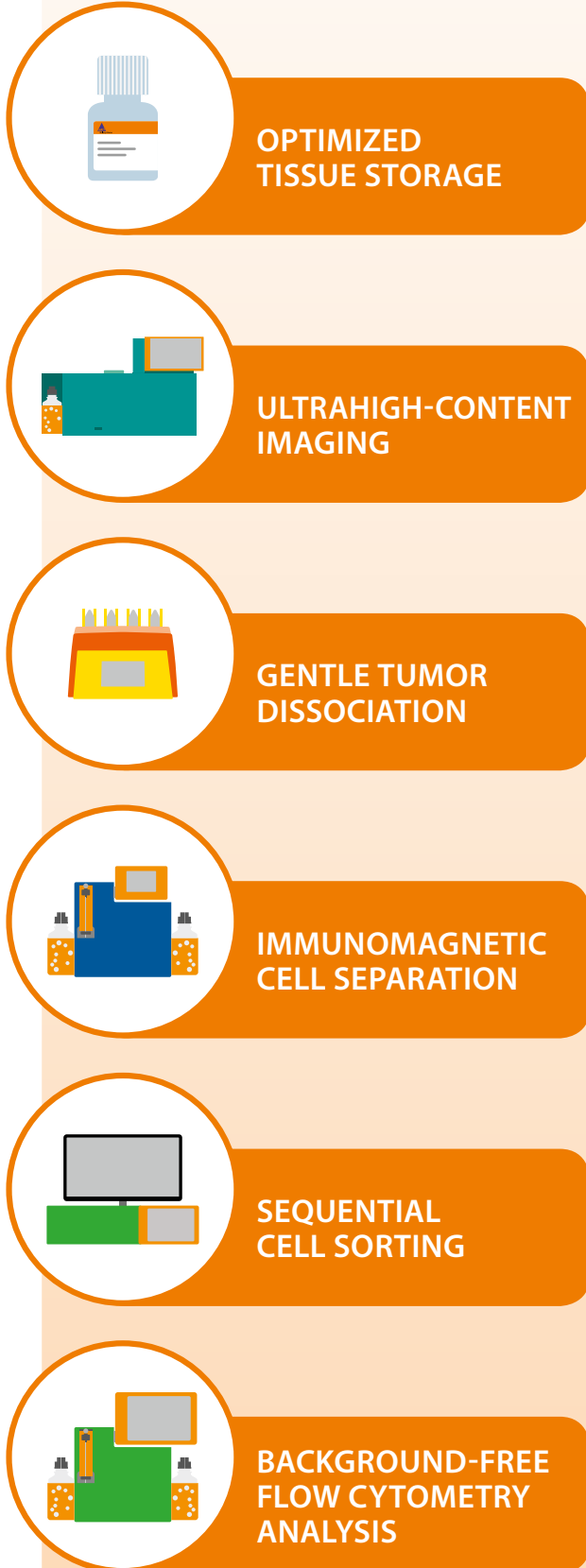
Miltenyi Biotec

Tumor-infiltrating leukocytes

Optimized solutions for TIL research



Workflow overview



Optimized tissue storage

Tumor samples are often shipped from collaboration sites or need to be stored while other samples are being processed. With MACS® Tissue Storage Solution, fresh tissue is kept safe.

- Storage of any solid tumor for up to 48 hours at 4 °C
- Optimal cell viability
- Preserved TIL composition

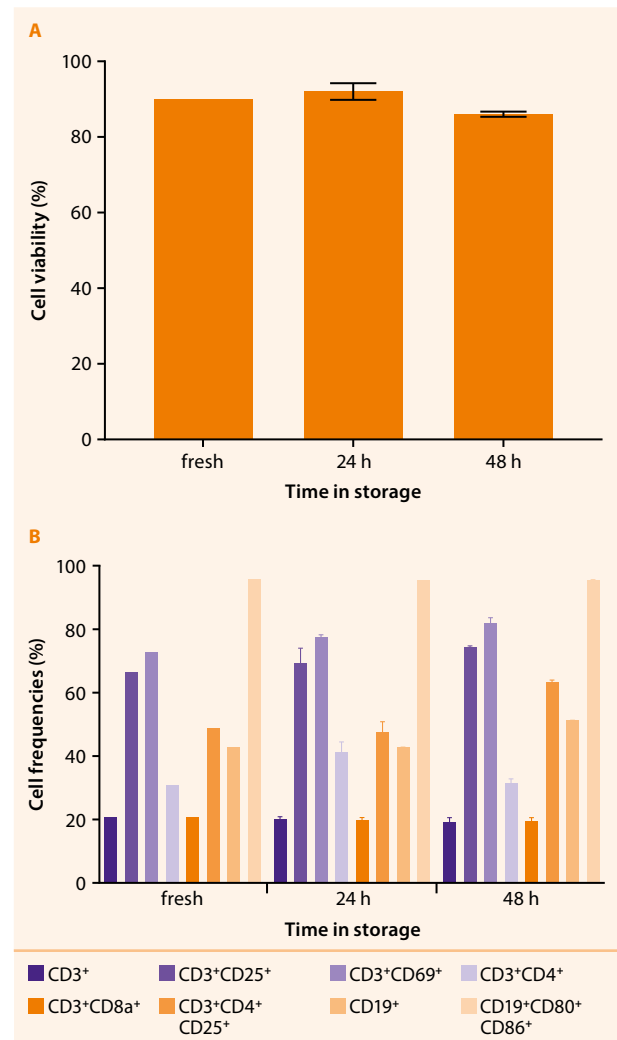


Figure 1: Preserved cell viability (A) and TIL composition (B) in stored tissue. CT26 tumors were stored at 4 °C in MACS Tissue Storage Solution for 24 h or 48 h. After dissociation with the Tumor Dissociation Kit, mouse and the gentleMACS™ Octo Dissociator with Heaters, TIL populations were analyzed using a MACSQuant® Analyzer.

Ultrahigh-content imaging

The MACSima™ Imaging Platform enables fully automated imaging of hundreds of markers in one sample by iterative staining. Analyze tissue sections, adherent cells, or cell suspensions for:

- Deep phenotyping of cell populations in the tumor microenvironment
- Biomarker discovery
- Drug target discovery

LEARN MORE



Download our scientific poster to learn how the MACSima Imaging Platform helps to reveal immune cell infiltration in tumor sections

► miltenyibiotec.com/til-imaging

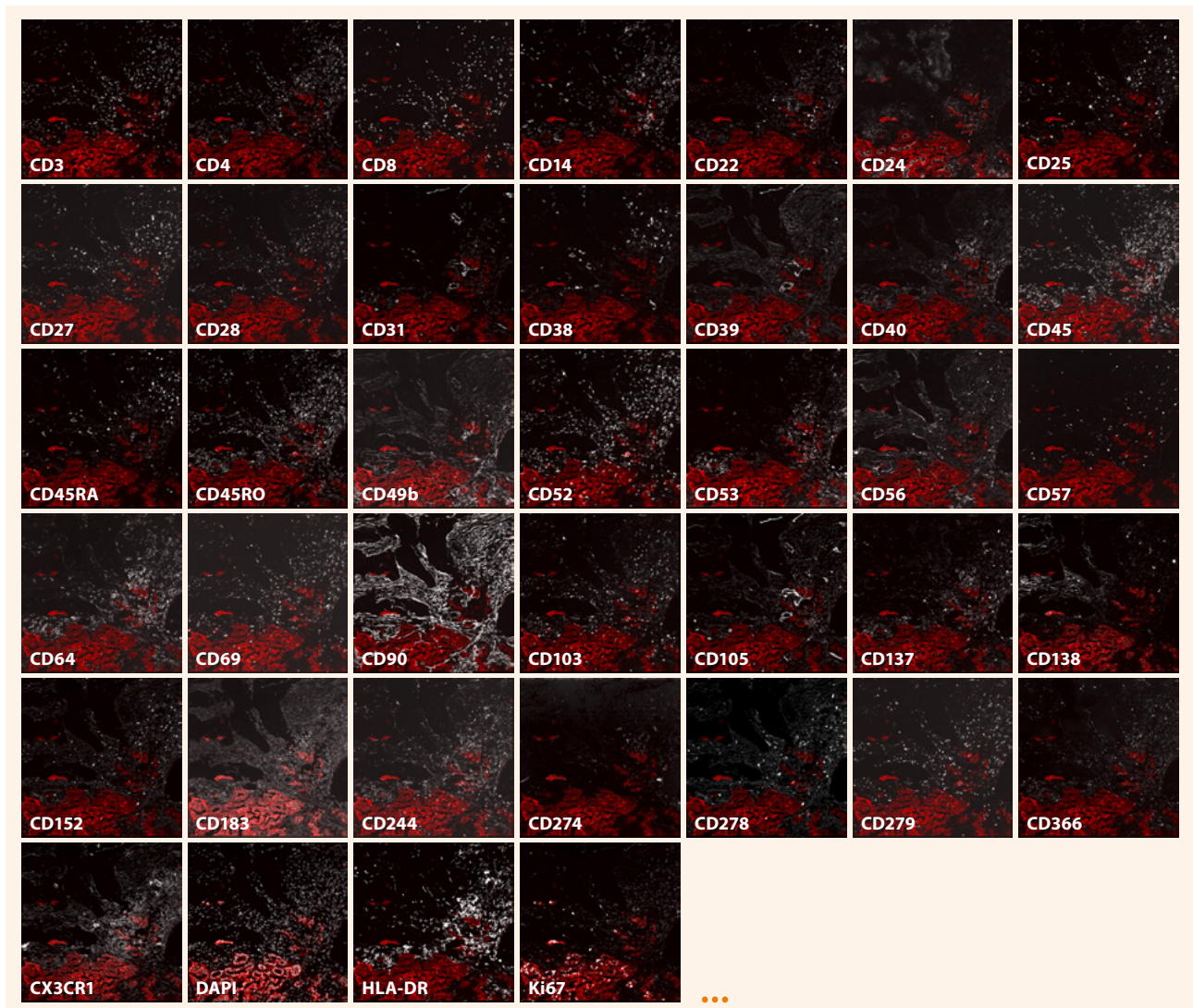


Figure 2: Spatial distribution and in-depth phenotyping of a colon carcinoma sample. One tissue section (approx. 1 cm wide) of human colon carcinoma was snap-frozen, fixed with acetone, and analyzed for different markers with the MACSima Imaging Platform. Tumor cells expressing EpCAM are depicted (red) and overlaid with the indicated marker (white). In this sample, TILs can be mostly observed at the margin area of the tumor.

Gentle tumor dissociation

Using our gentleMACS™ Dissociators with gentleMACS C Tubes and the Tumor Dissociation Kit, mechanical and enzymatic dissociation are combined to enable gentle, automated dissociation of fresh tumor tissue for optimal TIL recovery.

- Preservation of surface epitopes (>200 tested, both in human and mouse)
- Preserved cell functionality
- High lot-to-lot consistency for reproducible results

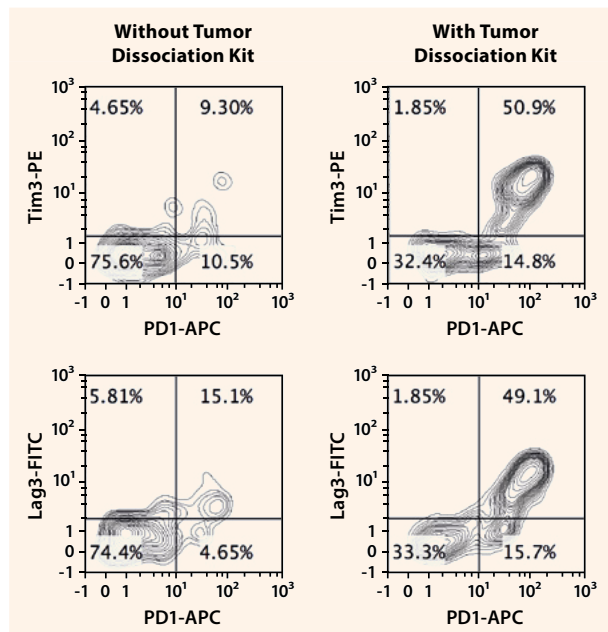


Figure 3: Recovery of CD8⁺ TILs from B16-F10 tumors. B16-F10 mouse tumors were collected and dissociated using the gentleMACS Octo Dissociator with Heaters in the presence or absence of the Tumor Dissociation Kit, mouse enzymes. Cells were subsequently labeled with REAfinity™ Antibodies and analyzed using a MACSQuant® Analyzer.

LEARN MORE

Download our application note to learn more about preservation of TIL functionality

► miltenyibiotec.com/functional-til-isolation

Immunomagnetic cell separation

The sensitivity of MACS® Technology allows for the enrichment of pure murine TIL populations from dissociated solid tumors for high-quality downstream analysis.

- Increased accuracy of analysis
- Less time needed for flow cytometry
- Compatible with automated enrichment with the autoMACS® Pro Separator

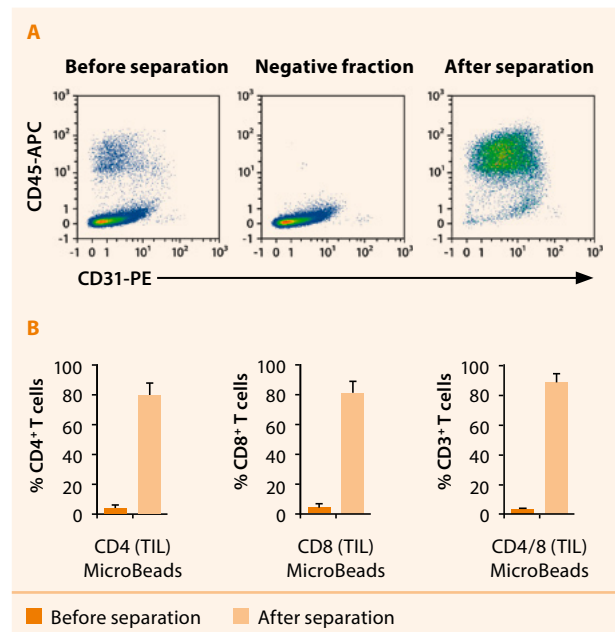


Figure 4: Enrichment of murine TILs. CD45⁺ TILs (A) or CD4⁺, CD8⁺, and CD4/CD8⁺ TILs (B) were isolated from mouse B16-F10 tumor tissue using CD45 (TIL), CD4 (TIL), CD8 (TIL), or CD4/8 (TIL) MicroBeads, mouse. Cell separation resulted in purities above 80%, which represents an up to 500-fold enrichment of the target cell population. TILs were analyzed using a MACSQuant Analyzer.

VIDEO

Watch our video to learn about TIL enrichment

► miltenyibiotec.com/til-video

Reversible cell labeling

For maximal flexibility, human TIL populations can be enriched with REAlease® MicroBead Kits. Based on our trusted MACS® Technology, REAlease Technology allows the removal of MicroBeads and labels.

- Sequential immunomagnetic enrichment of TIL subpopulations such as Treg cells, tissue-resident memory T cells, or TCR γ/δ^+ T cells
- Comprehensive immunophenotyping of isolated TILs
- Consecutive MicroBead-based applications, such as dead cell removal

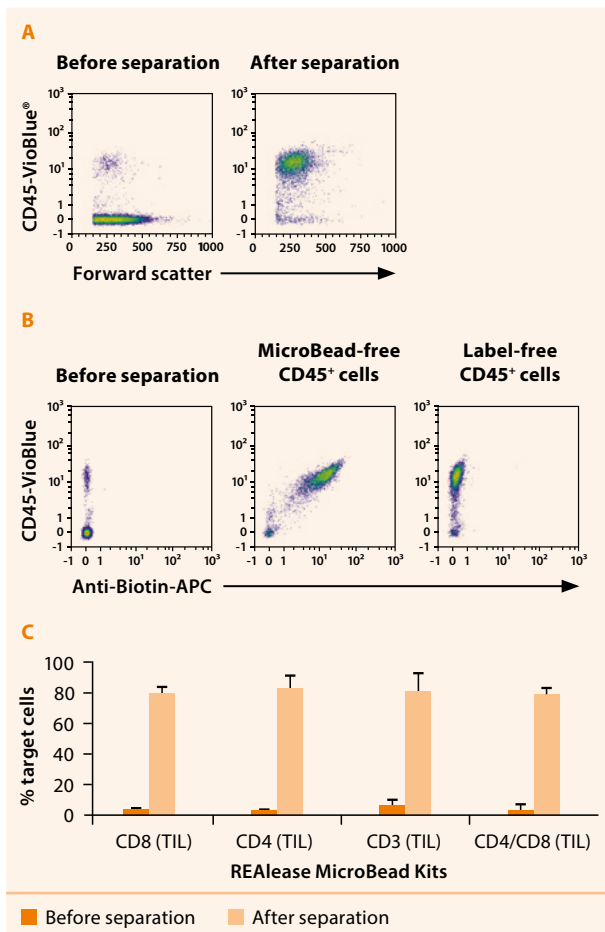


Figure 5: Enrichment of human TILs. Ovarian CD45⁺ TILs (A, B) or colorectal CD3⁺, CD4⁺, CD8⁺, or CD4/CD8⁺ TILs (C) were isolated from human carcinomas using REAlease CD45 (TIL), CD3 (TIL), CD4 (TIL), CD8 (TIL), or CD4/8 (TIL) MicroBead Kits, human. Cell separation resulted in purities above 80%. Isolated TILs were MicroBead and label free (B). TILs were analyzed using a MACSQuant® Analyzer.

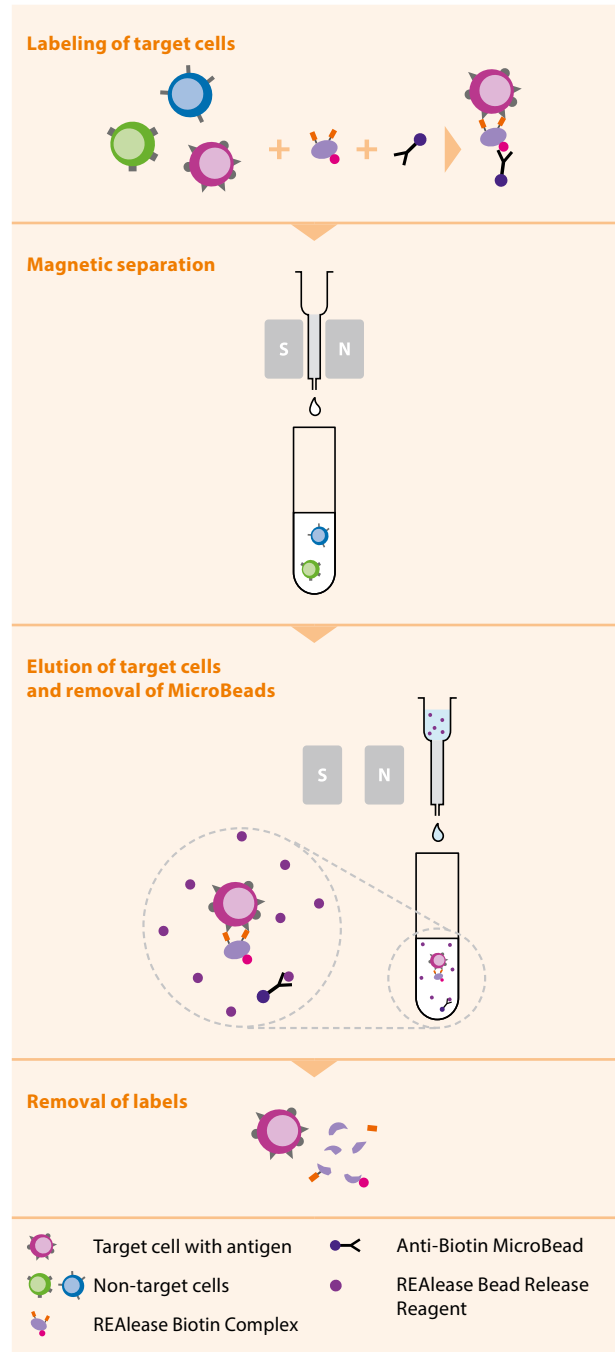


Figure 6: REAlease Immunomagnetic Separation Technology.

VISIT



Download our scientific poster

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Sequential cell sorting

Our microchip-based benchtop cell sorter, the MACSQuant® Tyto®, provides a fully closed and sterile sorting environment in the MACSQuant Tyto Cartridge. The sorting process takes place at a very low air pressure of <3 psi, without decompression or charge applied to the cells.

- Cell sorting based on up to 10 parameters
- No risk of sample contamination, carryover, or the generation of biohazardous aerosols
- Gentle sorting for highly viable and functional target cells

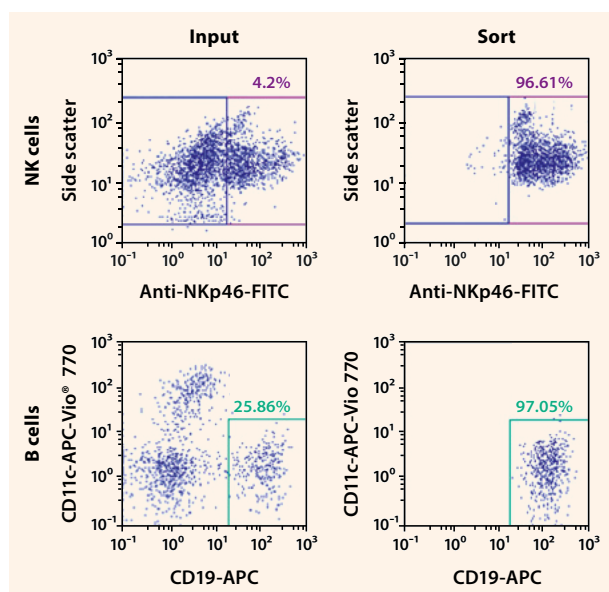


Figure 7: Sequential sorting of tumor-infiltrating NK and B cells. CT26 mouse tumor (1 g) was dissociated with the gentleMACS™ Octo Dissociator with Heaters and the Tumor Dissociation Kit, mouse and CD45⁺ TILs were pre-enriched using CD45 (TIL) MicroBeads, mouse. NK cells (CD45⁺, CD11b⁻, and anti-NKP46⁺) were sorted with the MACSQuant Tyto. The negative fraction was further sorted in a new cartridge for B cells (CD45⁺, CD11b⁻, anti-NKP46⁻, and CD19⁺). TILs were analyzed using the MACSQuant Analyzer 10.

VIDEO

Watch our video to learn how microchip-based cell sorting with the MACSQuant Tyto works

► miltenyibiotec.com/tyto-cartridge

Background-free flow cytometry analysis

Unspecific antibody binding to Fcγ receptors can lead to overestimation of TIL frequencies. REAfinity™ Recombinant Antibodies are engineered to lack any unspecific binding, providing a more exact analysis of respective cell populations even in the absence of FcR blocking.

- Superior lot-to-lot consistency and purity
- Highly specific antibodies
- No need for FcR blocking
- Universal IgG1 isotype, requiring only one isotype control

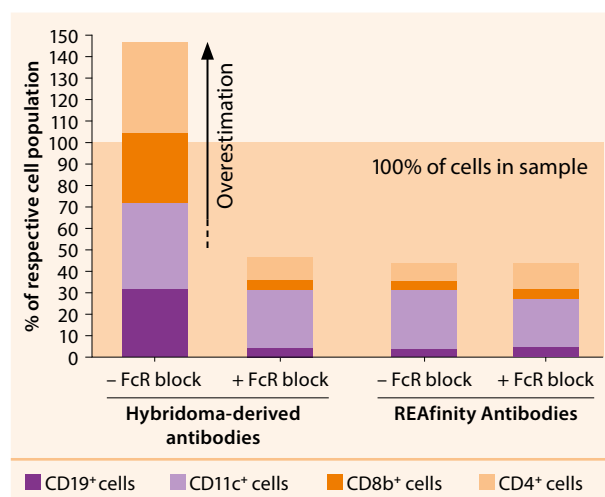


Figure 8: Flow cytometry phenotyping of TILs. H8N8 tumor single-cell suspensions were labeled with Viability™ 405/520 Fixable Dye and PE-labeled hybridoma-derived antibodies or REAfinity Recombinant Antibodies in the presence or absence of FcR blocking. Viable single cells were gated for the analysis using the MACSQuant Analyzer 10.

LEARN MORE

Download our application note to learn more about background-free TIL analysis

► miltenyibiotec.com/til-analysis-REAfinity

Product	Order no.
Tissue storage	
MACS® Tissue Storage Solution	130-100-008
Imaging	
MACSima™ Imaging System	130-121-164
Tissue dissociation	
gentleMACS™ Octo Dissociator with Heaters	130-096-427
Tumor Dissociation Kit, mouse	130-096-730
Tumor Dissociation Kit, human	130-095-929
Cell separation	
autoMACS® Pro Separator - Starter Kit	130-092-545
MultiMACS™ Cell24 Separator Plus	130-098-637
MACS Technology	
CD45 (TIL) MicroBeads, mouse	130-110-618
CD4 (TIL) MicroBeads, mouse	130-116-475
CD8 (TIL) MicroBeads, mouse	130-116-478
CD4/CD8 (TIL) MicroBeads, mouse	130-116-480
CD45 (TIL) MicroBeads, human	130-118-780
REAlEase® Technology	
REAlEase CD45 (TIL) MicroBead Kit, human	130-121-563
REAlEase CD3 (TIL) MicroBead Kit, human	130-121-562
REAlEase CD4 (TIL) MicroBead Kit, human	130-121-559
REAlEase CD8 (TIL) MicroBead Kit, human	130-121-560
REAlEase CD4/CD8 (TIL) MicroBead Kit, human	130-121-561
Cell sorting	
MACSQuant® Tyto® Cell Sorter	130-103-931
Flow cytometry analysis	
MACSQuant Analyzer 10	130-096-343
MACSQuant Analyzer 16	130-109-803

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Discover our antibodies at

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Discover our REAlEase Releasable Antibodies for label-free cells after sorting at

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