

Flow cytometry solutions

Discover MACSQuant®



MACSQuant® at the heart of your experiments

Miltenyi Biotec: an integrated portfolio to streamline research



macsquant.com

suspensions with the gentleMACS[™] Dissociators ▶ gentlemacs.com MACS[®] Cell Separation The gold standard in automated cell separation with the autoMACS[®] Pro Separator → automacspro.com

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MACSQuant VYB – Fluorescent protein detection Advance your cell analysis research

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Rare cell analysis With proven MACS Technology and without the waiting p. 7

Automation Up to 96 samples in a single run **p. 8**

MACSQuant® Analyzer – simple and versatile

Advance your cell analysis research with even more power

Converging capable cell analysis with compact convenience

The MACSQuant[®] Analyzer provides best in class flow cytometry to researchers working in a wide range of fields: from molecular interactions, pharmacokinetics, and cell biology to systems and marine biology and biophysics.

Best in class flow cytometry with unmatched convenience

Whether working with one or 96 samples, setting up your experiment on the MACSQuant Analyzer couldn't be easier.

Complete convenience

- Run experiments in a straightforward manner: from instrument startup to final analysis
- Walk-away processing of up to 96 samples in a single run
- Experience hassle-free instrument housekeeping, calibration, and compensation

Powerful performance

- Carry out multiparametric cell analysis via three lasers and up to ten optical channels
- Perform sophisticated phenotypic analysis and functional studies, e.g., cell cycle, apoptosis, and cell proliferation analysis on a variety of cell types, such as whole blood, cell lines, and yeast

Discover more at www.macsquant.com

Laser	Channel	Filter (nm)	Dye or parameter
Violet 405 nm	V1	450/50	CFP, VioBlue®
	V2*	525/50	Pacific Orange™
Blue 488 nm	B1	525/50	GFP, FITC
	B2	585/40	PE
	B3	655-730	PI, PerCP, PE-Cy [®] 5.5
	B4	750 LP	PE-Cy7
Red 635 nm	R1	655-730	APC
	R2	750 LP	APC-Cy7
Blue 488 nm	FSC	488/10	Size
	SSC	488/10	Granularity

Table 1: Optical configuration of MACSQuant Analyzer available in9 or 10 parameters (7 or 8 colors).

*Channel only available on 10 channel systems.



Figure 1: The MACSQuant Analyzer can be set up in confined laboratory spaces, even in regular laminar flow cabinets.



Figure 2: Built in features such as autolabeling of samples and barcode detection of MACS Antibodies can streamline your lab's workflow.



Figure 3: Illuminated bottles indicate the instrument status and can be easily monitored, even from across the laboratory.

MACSQuant[®] VYB – pure analytical power

Enhance your cellular and fluorescent protein analyses

Multicolor analysis that broadens research horizons

The MACSQuant VYB[®] delivers all the performance, automation, compactness, and convenience of the MACSQuant Analyzer but with a newly configured optical layout.

Detect fluorescent proteins with ease

By incorporating a 561 nm laser and eight fluorescent channels, the MACSQuant VYB offers researchers a greater choice of fluorochromes to perform sophisticated multicolor experiments.

- Analyze multiple "fruit dyes" at once, e.g., fluorescent proteins such as mCherry, DsRed, GFP, CFP, and others
- Profit from greater PE sensitivity for enhanced detection of PE^{dim} populations
- Rely on an optical configuration optimized for the detection of commonly used fluorochromes, e.g., FITC, PE-Cy5, APC, and PE-Cy7

Acquire a richer dataset in less time

The MACSQuant VYB allows researchers to perform elaborate multiplex investigations by detecting a greater number of colors simultaneously. This leads to the acquisition of more meaningful data in less time.

Intrigued? Discover more at www.macsquant.com

Laser	Channel	Filter (nm)	Dye or Parameter
Violet 405 nm	V1	450/50	CFP, VioBlue
	V2	525/50	Pacific Orange
Blue 488 nm	B1	525/50	GFP, FITC, YFP
	B2	614/50	PI, Lss-mKate, YFP
Yellow 561 nm	Y1	586/15	PE
	Y2	615/20	mCherry, dsRed, TexasRed®
	Y3	661/20	Pe-Cy5, APC, mKate
	Y4	750 LP	PE-Cy7
Yellow 561 nm	FSC	561/10	Size
	SSC	561/10	Granularity

Table 2: Optical configuration of MACSQuant VYB.



Figure 4: The MACSQuant VYB is configured with a 561 nm laser to offer versatility in analysis of both fluorescent proteins and standard antibody conjugates.



Figure 5: The MACSQuant VYB can detect a wide range of fluorescent proteins. Histograms of CHO cells transfected with CFP, GFP, YFP (top row), mCherry, and mKate2 (bottom row) are easily distinguished from nontransfected cells (shown in purple). GFP and YFP are often difficult to distinguish using flow cytometry due to similarities in their emission spectra. With the MACSQuant VYB, YFP (shown in yellow) and GFP (shown in green) cells are clearly distinguishable when observed in the PI channel (bottom right), making it possible to detect up to five fluorescent proteins in a single sample.

Powerful and compact – big in performance

Precise and accurate absolute cell counting

Accurate cell counts for every sample and population

Every MACSQuant Instrument is equipped with a precision syringe pump that enables automated and accurate uptake of sample volumes, i.e., volumetric pipetting. This provides several distinctive advantages over conventional flow cytometers:

- Speed: absolute cell counts given in less than a minute
- Cost-effective: no need for expensive counting beads or particles
- Ease-of-use: results at the touch of the button. The counting operation is integrated into each and every automated cell analysis

Cell counts as easy as ABC

- a. Place the sample on the rack Up to 96 samples can be processed in a single run
- b. Instruct the MACSQuantify[™] Software to pipette a specific volume of sample, e.g., 50 μL The instrument is equipped with a machine-engineered syringe pump for reliable and accurate pipetting

c. Press start

Results will be displayed within a minute

See absolute cell counting in action at: www.macsquant.com/cellcounting



Figure 6: Accurate cell counting with every sample can streamline staining and analysis.



Figure 7: Absolute cell counting is exact and reproducible. Counting beads were measured on the MACSQuant and compared to the manufacturer's published information. The number of beads per mL reported from the manufacturer's data sheet is shown in (A). Five tubes of counting beads were measured on the MACSQuant and the average value of the five tubes was calculated (B). The MACSQuant counts show no difference from the number reported from the manufacturer (Error bar: standard deviation).



Figure 8: Precise absolute cell counting is easily performed with the MACSQuant without the need for counting beads. Cells were serially diluted (1, 0.5, 0.25, 0.1, and 0.05) and the diluted cells were counted on the MACSQuant. The graph depicts the cell concentration measured by the instrument at each dilution. Number of cells per mL is linear with respect to dilution of a known cell number.

Rare cell enrichment – unrivaled MACS® Technology

Analyze low frequency cells with exceptional sensitivity

Rare cell analysis, without the waiting

Save time without compromising on the quality and sensitivity of your rare cell analyses. With the MACSQuant Column and MACSQuant Cell Enrichment Unit you can easily enrich rare cell populations prior to multiparametric cell analysis.

Integrating the power of MACS® Technology with flow cytometry

- Performing rare cell pre-enrichment prior to analysis serves to:
- Significantly reduce lengthy acquisition times
- Deliver highly sensitive rare cell analysis
- Allow easy analysis of particularly challenging rare cell samples, such as those in high or low volumes of buffer

Rare cell analysis, out of the box

Many kits and reagents have been optimized for the efficient identification and enumeration of a number of cell types and their subsets, including:

- Dendritic cells
- Endothelial progenitor cells
- Cancer stem cells
- Cytokine-secreting cells
- Antigen-specific T cells
- Circulating tumor cells

Visit www.macsquant.com for more information.



Figure 9: The MACSQuant Column allows the rapid pre-enrichment of rare cells prior to flow analysis.



Figure 10: The MACSQuant is equipped with the MACSQuant Cell Enrichment Unit to allow sensitive rare cell enrichment directly prior to cell analysis



Figure 11: Workflow for analysis of rare cell populations with the integrated MACSQuant Column and MACS MicroBead Technology.

Automation at its best – saves valuable time

Effortless flow cytometry: from hassle-free housekeeping to print-ready results

Flow cytometry that's satisfyingly simple

The MACSQuant Instruments have been designed with the busy scientist in mind. The instruments provide walk-away cellular analysis offering researchers more time to focus on other aspects of their workflow.

Seamless multisample processing with autolabeling

Benefit from a complete automated solution for sample processing: from sample labeling through uptake and data acquisition to analysis.

Accomplish multisample processing in a few simple steps

- Scan reagents using the barcode reader. The MACSQuantify Software automatically identifies the correct staining protocols and minimizes user error
- 2. Place reagents and samples onto the MACS MiniSampler. Samples are kept cool by MACS Chill Racks thereby maintaining specimen integrity
- 3. Instruct the MACSQuantify Software to perform the desired analysis and press start

Up to 96 samples can be processed in a single run:

- Labeling is fully automated using correct incubation times and titers (e.g., PI, 7AAD, and antibody staining)
- The entire process is streamlined, delivering walk-away flow cytometric analysis

Hassle-free housekeeping

MACSQuant Instruments have been designed to automate and optimize routine instrument procedures.

Automated instrument calibration and compensation

- MACSQuant Calibration Beads have been specially developed for the automated optimization of channel voltage settings, thus ensuring consistently high performance
- Single-stained cells or compensation beads can be used for fully automated compensation on up to eight colors via an 8×8 matrix (figure 13)

More than just system cleaning

- Automated cleaning cycles, start-up, and shutdown
- Continual monitoring of buffer, reagent, and waste levels
- Touch control of system status



Figure 12: The MACS Chill 96 Rack is compatible with various 96-well plate formats.



Figure 13: Automated compensation with beads or cells. Save time with fully automated compensation with the MACSQuant.

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Reagents, kits, and software

Discover our comprehensive portfolio for cell analysis needs

Reagents

Miltenyi Biotec is a leading provider of comprehensive solutions for flow cytometry. We offer a wide range of kits, antibodies, fluorochromes, and instrumentation that more than meets the demands of cutting-edge cell analysis.

Benefit from a range of unique and standard monoclonal antibodies, ready-to-use kits, and isotype controls for your cell research.

MACS Antibodies

Fluorochrome-conjugated MACS Antibodies are perfectly suited for the identification and enumeration of human, mouse, rat, or non-human primate cells by flow cytometry or microscopy.

- · Comprehensive: broad panel of antibodies
- Versatile: phenotyping of any immune cell type
- Flexible: numerous fluorochromes to choose from

VioBlue – brighter options for multiparameter analysis

VioBlue, a powerful dye for use with a violet laser, further expands your choice of marker combinations for multiparameter cell analysis by flow cytometry (figure 14).



Figure 14: Analysis of cells using CD14 antibodies conjugated to either VioBlue (blue line; stain index: 34.7) or Pacific Blue™ (black line; stain index: 28.43).

Stay in control with MACS Control Antibody Cocktails

Evaluating the separation efficiency and purity of a MACS Cell Separation couldn't be easier with MACS Control Antibody Cocktails. These kits contain pre-titrated MACS Antibodies for the optimal staining of cells separated with MACS Technology. The staining procedure is fast, easy, and compatible with flow cytometry. Pre-mixed cocktails provide seamless cell population analysis. Combine these with the MACSQuant Express Modes for one-click cellular analysis (figure 15).



Figure 15: Analysis of peripheral blood mononuclear cells using automated analysis with the MACSQuant Analyzer and MACS Control CD19 B Cell Cocktail (human).

MACSQuantify Software – combining complex data analysis with intuitive instrument control

The MACSQuantify Software is an intuitive program that not only acts as a user interface to the MACSQuant Analyzer, but also provides a powerful standalone application for data analysis on individual computers. Routine and complex analyses can be mastered with ease due to the innovative touchscreen menus that feature:

- Automated fluorescence compensation
- Express modes enabling inexperienced users to perform complex gating strategies using pre-defined templates
- Easy export of data as FCS files for use in third party analysis software

Real-time support

Get live support anywhere, anytime

At the click of a button you can receive real-time support from a MACSQuant Application Specialist

Any networked MACSQuant user can have real-time access to technical support by activating the Live Support function. The Live Support service allows the MACSQuant Application Specialist to interact with the user, view the software, and take control (if needed) of the instrument to resolve any issues. Live Support is available for worldwide customers 24 hours a day.

Our specialists can offer you advice on:

- Troubleshooting MACSQuant operational issues
- Operating the MACSQuant Analyzer and MACSQuantify Software
- Experimental design
- Troubleshooting experimental protocols
- Choosing the appropriate Miltenyi Biotec product to meet your needs

Sales support and application specialists

Miltenyi Biotec technical and field application consultants have a background in life sciences and can offer advice on:

- Experimental design
- Troubleshooting experimental protocols
- Choosing the appropriate Miltenyi Biotec product

Learning center

We cater to your individual training needs.

- · Hands-on training at regional Miltenyi Biotec facilities
- Online multimedia presentations
- · Webinars for real-time access to a Miltenyi Biotec expert



Figure 16: Real-time access to our MACSQuant Application Specialists is available 24 hours a day for advice on analysis and operation of the instrument.



Figure 17: Miltenyi Biotec offers comprehensive training covering a variety of formats: from hands-on instrument training to online webinars.

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Trusted worldwide service

Benefit from service options tailor-made for customer needs

Service and support

Benefit from our worldwide team of service engineers with a variety of service plans to fit your needs.

- Reduce costs by avoiding instrument downtime or sample loss
- Maintain instrument performance and ultimately the quality of data
- A Miltenyi Biotec representative is only a phone call away
- Remote support access available for instant troubleshooting and diagnosis
- Several service plans available to fit any budget

Worldwide technical support is available through:

- E-mail or telephone: simply ask technical support a question
- Real-time / remote support
- An online discussion forum
- A list of frequently asked questions online
- A comprehensive library of data sheets and online protocols



Figure 18: Benefit from our team of service engineers.

Instrument service

Our instrument service team is comprised of highly qualified and certified engineers specialized in providing support for Miltenyi Biotec instrumentation, including the MACSQuant Analyzer. For more information about our comprehensive range of service and support agreements, visit: www.miltenyibiotec.com/support

Options service included	Full service L	Full service	Planned mainte- nance	One-time mainten- ance on- demand*
Planned Maintenance (PM)	✓	✓	~	✓
Replacement of wearing parts	✓	✓	✓	✓
Device software updates	✓	✓	~	✓
Labor, shipment, and associated PM logistic costs	√	✓	✓	✓
Maintenance intervals (PM per year)	2	2	2	1
Repair and replacement	✓	✓		
Labor, travel, expenses required to perform service	√	✓		
Replacement parts	\checkmark	✓		
Laserheads included	✓			
Technical support services	✓	✓	✓	✓
Service documentation	✓	✓	✓	~

Table 3: Instrument service plan options

*No service contract is required for the "one-time maintenance on-demand" option. A one-time service is simply performed on-demand.

MACSQuant Analyzers and accessories

Product	Order No.
Instruments	
MACSQuant Analyzer	130-092-197
MACSQuant Analyzer 10	130-096-343
MACSQuant VYB	130-096-116
MACS Minisampler	130-092-535
Service agreements	
MACSQuant Full Service L Agreement	160-001-287
MACSQuant Full Service Agreement	160-001-286

Product	Order No.
Accessories	
Chill 5 Rack	130-092-951
Chill 96 Rack	130-094-459
MACS Reagent Rack 4	130-094-574
MACSQuant Columns	130-094-458
MACS Calibration Beads	130-093-607
MACSQuant Running Buffer	130-092-747
MACSQuant Washing Solution	130-092-749
MACSQuant Storage Solution	130-092-748
MACSQuant Washing & Storage Solution Kit	130-092-801
MACS Bleach Solution	130-093-663
MACSQuant Starting Buffer Kit	130-094-190

Cell analysis reagents and kits

Product	Order No.
Antibodies, human	
CD34-PE	130-081-002
CD45-VioBlue	130-092-880
CD133/1 (AC133)-APC	130-090-826
CD271 (LNGFR)-APC	130-091-884
CD326 (EpCAM)-FITC	130-080-301
Antibodies, mouse	
Anti-mPDCA-1 pure	130-091-978
CD154-APC	130-092-105
Anti-DCAR1-PE	130-095-317
Anti-GITR pure	130-092-630
Anti-IL-17A-FITC	130-094-298
MACS Control Cocktails	
MC CD34/CD133 Stem Cell Cocktail, human	130-092-882
MC CD4 T Cell Cocktail, human	130-092-914
MC CD19 B Cell Cocktail, human	130-092-860
MC CD90.2 T Cell Cocktail, mouse	130-092-862
MC CD19 B Cell Cocktail, mouse	130-092-864
Kits for cell detection and enumeration	
MSC Phenotyping Kit, human	130-095-198
EPC Enrichment and Enumeration Kit, human	130-093-477
Mo-DC Differentiation Inspector, human	130-093-567
Lineage Cell Detection Cocktail-Biotin, mouse	130-092-613
Treg Detection Kits (CD4/CD25/FoxP3), mouse	130-094-165

For the complete portfolio visit: www.macsquant.com

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Germany/Austria/

Au

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

Fax 800 24984

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

China

France

Miltenyi Biotec SAS

10 rue Mercoeur

75011 Paris, France

Fax +33 1 56 98 16 17

Phone +33 1 56 98 16 16

macs@miltenyibiotec.fr

Miltenyi Biotec GmbH Shanghai Office Rm. 2309–2310, No. 319 Xianxia Rd. Shanghai 200051, P.R. China Phone +86 21 62351005 Fax +86 21 62350953 macs@miltenyibiotec.com.cn

Italy Milter Via Pe

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

Miltenyi Biotec S.r.l.

Japan

Miltenyi Biotec K.K. Nittsu-Eitai Building SF 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

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Niltenyi 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.

Spain

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

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