



Miltenyi Biotec

Get your CAR T cell research moving

Take advantage of our expertise in CAR T cell research, therapy development, and clinical manufacturing. Discover our product portfolio for proven CAR T cell research applications that enable an easy translation into clinical CAR T cell manufacturing proceeding with the MACS® GMP Portfolio.

- Isolation of T cells from PBMCs or blood products
- Efficient T cell activation, gene transfer, and expansion
- CAR T cell flow analytics and monitoring
- Innovative products from research to MACS GMP Grade

► miltenyibiotec.com/CART-research



Streamline your workflow and advance CAR T cell therapies

Benefit from our expertise in CAR T cell research and clinical manufacturing by selecting our straightforward, translational workflow. Begin your research with our tailored, small-scale CAR T cell engineering solutions for research and development. Once your workflow has been successfully established, transfer your process to the CliniMACS Prodigy® Platform using the corresponding MACS® GMP Portfolio products. Seamless, quick and easy, from bench to bedside.

T cell enrichment

Commence your research with a well-defined enriched T cell population. Obtain standardized and reproducible results with our proven MACS MicroBeads to enrich T cells from PBMCs or directly from blood products.

- Standard **CD4 and CD8 MicroBeads** for positive selection
- **Pan T Cell Isolation Kit** for untouched and sequential T cell subset isolation
- **StraightFrom® Technology** for fast and easy T cell enrichment without density gradient centrifugation, directly from blood products
- **MACSprep™ CD19 CAR MicroBead Kit**, human and further CAR T cell enrichment kits

T cell activation and expansion

T cell activation is vital in order to start the proliferation process and facilitate an efficient CAR transduction. **T Cell TransAct™**, with its unique features, enables biologically appropriate activation for your T cells. Your T cells are then expanded up to 5 times more than with bead-based assays. Our novel reagent is:

- An innovative nanomatrix, conjugated to humanized CD3 and CD28 agonists for maximal convenience and minimum hands-on time
- Optimized for CAR T production on the CliniMACS Prodigy Platform
- Compatible for small-scale experiments to large-scale CAR T cell manufacturing

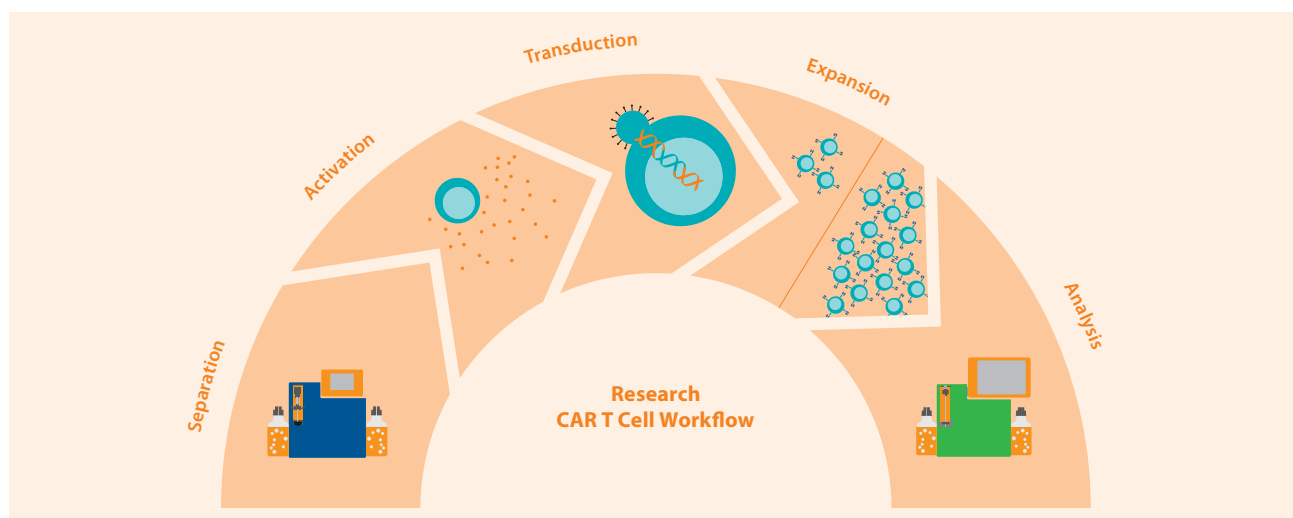
T cell transduction

Enhance the transduction efficiency of your viral vector by using the synthetic, non-toxic, soluble **Vectofusin-1®** with a simple and easy-to-follow protocol.

CAR T cell expansion

Optimal cultivation and expansion of transduced T cells rely on the strong synergy of **T Cell TransAct**, **TexMACS™ Medium**, and **MACS Cytokines**.

- Serum-free TexMACS Medium for optimal growth and expansion rates
- MACS Cytokines (IL-2, IL-7, IL-15) with lot-to-lot consistency and lot-specific certificates of analysis, low endotoxin levels, and high purity for relevant pre-clinical studies



CAR T cell analytics

Quick, easy, and standardized multi-parameter analysis is key to generate reliable and consistent results. Our CAR T cell analytics portfolio provides high-quality reagents and instruments to streamline your CAR T cell flow analysis. Our product range assists you with various analytics, including phenotypic analysis, functional *in vitro* potency assays, and patient monitoring.

- Predefined and proven **REAfinity™ Antibody Panels** to efficiently assess immune cell composition, T cell activation and exhaustion
- Ready to use **CAR Detection Reagents** to validate CAR expression
- **StainExpress™ dried antibody cocktails** for maximum convenience and reproducibility
- **Annexin V-FITC Kit and 7-AAD Staining Solution** to evaluate CAR T cell fitness
- **Rapid Cytokine Inspector Kits** for fast, high-throughput, multi-parameter analysis of activated cytokine secreting human T cells. Combining extracellular marker staining with intracellular cytokine detection
- **MACSPlex Cytokine Kits** for multiplex cytokine screening
- Cytotoxicity test against target cells using high-throughput **cell viability assays**
- **MACSQuant® Flow Cytometer and Express Modes** for standardized, automated acquisition and data analysis
- Intuitive, easy-to-use software interface for a multi-user environment

Selected products

Product	Order no.
CD4 MicroBeads, human	130-045-101
CD8 MicroBeads, human	130-045-201
Pan T Cell Isolation Kit, human	130-096-535
StraightFrom Buffy Coat CD4/CD8 MicroBead Kit, human	130-121-312
MACSprep CD19 CAR MicroBead Kit, human	130-127-866
MultiMACS™ Cell24 Separator Plus	130-098-637
T Cell TransAct, human	130-111-160
TexMACS Medium	130-097-196
Human IL-7, premium grade	130-095-361
Human IL-15, premium grade	130-095-762
Human IL-2, premium grade	130-097-742
Vectofusin®-1	130-111-163
REAfinity Recombinant Antibodies	Various
CD19 CAR Detection Reagent, human	130-115-965
Rapid Cytokine Inspector (CD4/CD8 T Cell) Kit, human	130-097-343
MACSPlex Cytokine 12 Kit, human	130-099-169
Annexin V-FITC Kit	130-092-052
7-AAD Staining Solution	130-111-568
CAR T Cell Express Mode Package	160-002-376
MACSQuant Analyzer 10	130-096-343



Miltenyi Biotec B.V. & Co. KG | Friedrich-Ebert-Straße 68 | 51429 Bergisch Gladbach | Germany | Phone +49 2204 8306-0 | Fax +49 2204 85197
macsde@miltenyi.com | www.miltenyibiotec.com

Miltenyi Biotec provides products and services worldwide. Visit www.miltenyibiotec.com/local to find your nearest Miltenyi Biotec contact.

Cover image copyright: ©Eye of Science

Unless otherwise specifically indicated, Miltenyi Biotec products and services are for research use only and not for therapeutic or diagnostic use. MACS GMP Products are for research use and *ex vivo* cell culture processing only, and are not intended for human *in vivo* applications. For regulatory status in the USA, please contact your local representative. MACS GMP Products are manufactured and tested under a quality system certified to ISO 13485 and are in compliance with relevant GMP guidelines. They are designed following the recommendations of USP <1043> on ancillary materials. The CliniMACS System components, including Reagents, Tubing Sets, Instruments, and PBS/EDTA Buffer, are designed, manufactured and tested under a quality system certified to ISO 13485. In the EU, the CliniMACS System components are available as CE-marked medical devices for their respective intended use, unless otherwise stated. The CliniMACS Reagents and Biotin Conjugates are intended for *in vitro* use only and are not designated for therapeutic use or direct infusion into patients. The CliniMACS Reagents in combination with the CliniMACS System are intended to separate human cells. Miltenyi Biotec as the manufacturer of the CliniMACS System does not give any recommendations regarding the use of separated cells for therapeutic purposes and does not make any claims regarding a clinical benefit. For the manufacturing and use of target cells in humans, the national legislation and regulations – e.g. for the EU the Directive 2004/23/EC ("human tissues and cells"), or the Directive 2002/98/EC ("human blood and blood components") – must be followed. Thus, any clinical application of the target cells is exclusively within the responsibility of the user of a CliniMACS System. In the US, the CliniMACS CD34 Reagent System, including the CliniMACS Plus Instrument, CliniMACS CD34 Reagent, CliniMACS Tubing Sets TS and LS, and the CliniMACS PBS/EDTA Buffer, is FDA approved as a Humanitarian Use Device (HUD), authorized by U.S. Federal law for use in the treatment of patients with acute myeloid leukemia (AML) in first complete remission. The effectiveness of the device for this indication has not been demonstrated. Other products of the CliniMACS Product Line are available for use only under an approved Investigational New Drug (IND) application, Investigational Device Exemption (IDE) or FDA approval. CliniMACS GMP MicroBeads are for research use and *ex vivo* cell processing only. CliniMACS Prodigy, MACS, MACSQuant, MACSprep, the Miltenyi Biotec logo, MultiMACS, REAfinity, StainExpress, TexMACS, TransAct, and StraightFrom are registered trademarks or trademarks of Miltenyi Biotec and/or its affiliates in various countries worldwide. Vectofusin is a registered trademark of Genethon. Copyright © 2021 Miltenyi Biotec and/or its affiliates. All rights reserved.