



Miltenyi Biotec

# MACS<sup>®</sup> GMP Cytokines

Quality to meet your demands

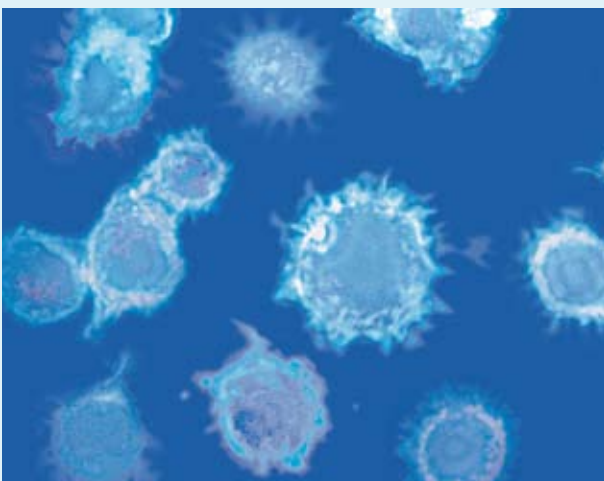


# MACS® GMP Cytokines

— deliver performance, consistency, and compliance for demanding applications



**Fig. 1:** MACS GMP Cytokines – quality products to meet your demands



**Fig. 2:** Dendritic cells were generated by culturing CD133<sup>+</sup> hematopoietic progenitor cells using a cocktail of different cytokines.

## Superior quality cytokines

- Designed, produced, tested, and documented to meet high quality standards.
- Manufactured in accordance to Good Manufacturing Practice (GMP) standards.
- Intended for *ex vivo* cell culture processing and research use.
- Designed according to the recommendations of <USP 1043> on ancillary materials.
- Free of human- and animal-derived components.
- Quality control – specific activity, sterility, purity, identity, protein content, endotoxin content, host cell DNA content, and host cell protein content.
- Lot-specific certificate of analysis.
- Manufactured and tested under a certified ISO 9001 quality system.

## Fields of applications

- Cultivation and differentiation of cells in clinical research.
- Cell culture media production.
- Relevant pre-clinical research applications requiring highest product quality.
- Drug discovery and development: embryonic stem cell differentiation for improved humanized *in vitro* models.



## MACS® GMP Cytokines

— stringent manufacturing processes and quality control



**Fig. 3:** Bioreactor and protein purification equipment for fermentation and downstream processing

### Stringently controlled manufacturing process

The GMP-certified facility in Teterow encompasses upstream processing areas (cell culture/fermentation) and downstream processing as well as aseptic fill and finish.

Miltenyi Biotec is committed to maintain state-of-the-art product quality standards. Controlled production procedures and comprehensive quality control tests ensure consistent product quality.



**Fig. 4:** Automated and aseptic filling, lyophilization, and finishing ensures product consistency and sterility



# MACS® GMP Cytokines

— reliability and flexibility on demand



Fig. 5: MACS GMP Cytokines – assure reliability and flexibility

Product table	Order No.
MACS GMP Recombinant Human FGF-2	170-076-107
MACS GMP Recombinant Human GM-CSF	170-076-112
MACS GMP Recombinant Human IL-1 $\beta$	170-076-102
MACS GMP Recombinant Human IL-2*	170-076-113
MACS GMP Recombinant Human IL-3	170-076-110
MACS GMP Recombinant Human IL-4	170-076-101
MACS GMP Recombinant Human IL-6	170-076-104
MACS GMP Recombinant Human IL-7*	170-076-111
MACS GMP Recombinant Human TNF- $\alpha$	170-076-103

Other products in development:
MACS GMP Recombinant Human EGF
MACS GMP Recombinant Human Flt3-ligand
MACS GMP Recombinant Human IL-15
MACS GMP Recombinant Human IL-21
MACS GMP Recombinant Human SCF
MACS GMP Recombinant Human TPO
Cytokines on demand

\*coming soon

## Reliability

- Reliable supply and fast delivery
- Traceability of products and qualification of raw materials
- Extensive documentation

## Flexibility on demand

- Large-scale manufacturing: mg to g scale
- Customized and tailored products:
  - From small amounts to bulk quantities
  - Customized formulations
  - Flexible fill and finish according to customer requirements
- Custom cytokines produced in bacterial or eukaryotic expression systems
- Different quality formats: Cytokines are also available in premium and research grade

For further information on cytokines, please refer to [www.miltenyibiotec.com/cytokines](http://www.miltenyibiotec.com/cytokines)



## MACS® GMP Cytokines

— a trusted source delivering quality



**Fig. 6:** Miltenyi Biotec GMP facility in Teterow, Germany



**Fig. 7:** Broad knowledge and skill levels among employees, ranging from technical to regulatory expertise

### Trusted source

Miltenyi Biotec is a leading provider of products advancing cell-based clinical research and promoting the growth of cellular therapy. The production of high quality cytokines for the differentiation and expansion of target cells follows from our research focus on stem cell-based tissue regeneration as well as immunotherapy, including adoptive T cell transfer, NK cell-based therapies, and dendritic cell vaccination.

### Quality on every level

- Manufactured in our state of the art GMP facility in Teterow, Germany.
- Rigorously-defined and controlled industrial processing steps – from master cell banks to final filled products.
- Qualified equipment and employees.
- Standardized manufacturing processes in a controlled environment.
- Optimized formulation for reliable reconstitution and performance.
- Stringent quality control, comprehensive analytical methods.
- Experience in GMP biologicals production.



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MACS GMP Cytokines, are for research use and *ex vivo* cell culture processing only, and are not intended for human in vivo applications. The products are manufactured and tested under a certified ISO 9001:2000 quality system and in compliance with relevant GMP guidelines and the recommendations of USP chapter 1043 on ancillary materials.

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