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### 1. Description

<b>Products</b>	Human M-CSF, research grade. Recombinant human macrophage-colony stimulating factor.						
	<table border="1"> <thead> <tr> <th>Content in µg</th><th>Order no.</th></tr> </thead> <tbody> <tr> <td>10</td><td>130-093-963</td></tr> <tr> <td>25</td><td>130-096-491</td></tr> </tbody> </table>	Content in µg	Order no.	10	130-093-963	25	130-096-491
Content in µg	Order no.						
10	130-093-963						
25	130-096-491						
<b>Biological activity</b>	The ED <sub>50</sub> is ≤0.1 ng/mL corresponding to an activity of ≥1×10 <sup>7</sup> IU/mg.  ▲ <b>Note:</b> The ED <sub>50</sub> is determined by proliferation assay using mouse M-NFS-60 cells. <sup>1</sup> The proliferation assay was calibrated with the international standard for human M-CSF (NIBSC code 89/512) provided by the WHO/ National Institute for Biological Standards and Control.						
<b>Primary structure</b>	Two identical, non-glycosylated polypeptide chains (158 amino acid residues) without N-terminal methionine linked by a disulfide bond.						
<b>Molecular mass</b>	36.8 kDa (dimer).						
<b>Source</b>	Produced in <i>E. coli</i> .						
<b>Product format</b>	Lyophilized from a filtered (0.2 µm) buffer solution.						
<b>Stabilizer</b>	Mannitol and trehalose.						
<b>Purity</b>	>97% as determined by SDS-PAGE analysis.						
<b>Endotoxin level</b>	Low endotoxin (<1.0 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.						
<b>Storage</b>	Lyophilized Human M-CSF, research grade should be stored at -20 °C. The expiration date is indicated on the vial label. Upon reconstitution aliquots should be stored at -20 °C or below. Avoid repeated freeze-thaw cycles.						
<b>Reconstitution</b>	It is recommended to reconstitute lyophilized Human M-CSF, research grade with deionized sterile-filtered water to a final concentration of 0.1–1.0 mg/mL in a minimal volume of 100 µL. Further dilutions should be prepared with 0.1% bovine serum albumin (BSA) or human serum albumin (HSA) in phosphate-buffered saline.						

#### 1.1 Background information

Macrophage-colony stimulating factor (M-CSF), a four α-helical bundle cytokine, is a potent hematopoietic regulator. It is primarily produced by monocytes, granulocytes, endothelial cells, and fibroblasts. The main function of M-CSF is the regulation of proliferation, differentiation, and survival of monocytes, macrophages and their hematopoietic progenitors. Furthermore, M-CSF has been shown to play an important role in immunological defense, bone metabolism, fertility, and pregnancy.

#### 1.2 Applications

Human M-CSF can be used for a variety of applications, including:

- Survival studies and apoptosis assays, for example, using peripheral blood monocytes.
- Differentiation of macrophages from peripheral blood monocytes.
- Differentiation of osteoclasts from CD14<sup>+</sup> monocytes.

Optimal concentration for a specific application should be determined by a dose-response experiment.

### 2. References

1. Mire-Sluis, A.R. *et al.* (1995) The international standard for macrophage colony stimulating factor (M-CSF). Evaluation in an international collaborative study. *J. Immunol. Methods* 179: 141–151.
2. Michelet, X. *et al.* (2015) MHC class II presentation is controlled by the lysosomal small GTPase, Arl8b. *J. Immunol.* 194 (5): 2079–2088.
3. Vogel, S. Z. *et al.* (2015) TCAIM decreases T cell priming capacity of dendritic cells by inhibiting TLR-induced Ca<sup>2+</sup> influx and IL-2 production. *J. Immunol.* 194 (7): 3136–3146.
4. Guery L. *et al.* (2014) Fine-tuning nucleophosmin in macrophage differentiation and activation. *Blood* 118: 4694–4704.
5. McEwan, W. A. *et al.* (2013) Intracellular antibody-bound pathogens stimulate immune signaling via the Fc receptor TRIM21. *Nat. Immunol.* 14 (4): 327–336.
6. Bénétteau, M. *et al.* (2012) Combination of glycolysis inhibition with chemotherapy results in an antitumor immune response. *Proc. Natl. Acad. Sci. U.S.A.* 109 (49): 20071–20076.
7. Wang, C. *et al.* (2010) Innate immune response to *Mycobacterium tuberculosis* Beijing and other genotypes. *PLoS One* 5 (10): e13594.
8. Meissner, F. *et al.* (2010) Inflammasome activation in NADPH oxidase defective mononuclear phagocytes from patients with chronic granulomatous disease. *Blood* 116 (9): 1570–1573.

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