

PRODUCT INFORMATION



GM-CSF (human, recombinant)

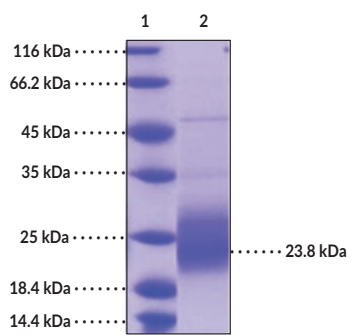
Item No. 32044

Overview and Properties

Synonyms:	CSF2, Granulocyte-macrophage Colony-stimulating Factor
Source:	Active recombinant human GM-CSF expressed in HEK293 cells
Amino Acids:	18-144
Uniprot No.:	P04141
Molecular Weight:	14.5 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥90% estimated by SDS-PAGE
Supplied in:	Lyophilized from sterile PBS, pH 7.4
Endotoxin Testing:	<1.0 EU/μg, determined by the LAL endotoxin assay
Bioactivity:	See figures for details

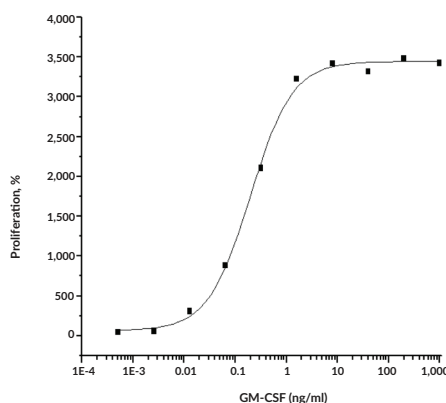
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: GM-CSF

SDS-PAGE Analysis of GM-CSF. This protein has a calculated molecular weight of 14.5 kDa. It has an apparent molecular weight of approximately 23.8 kDa by SDS-PAGE under reducing conditions due to glycosylation.



Cell Proliferation Assay Using TF-1 Human Erythroleukemic Cells. The EC₅₀ value for this effect is typically 0.1-0.6 ng/ml.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the [complete](#) Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
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Description

Granulocyte-macrophage colony-stimulating factor (GM-CSF) is a secreted glycoprotein encoded by the *CSF2* gene in humans that promotes the differentiation, proliferation, and function of a variety of progenitor or mature cells.^{1,2} GM-CSF exists as a secreted, disulfide-linked monomer and is composed of four α -helices and two anti-parallel β -sheets that contain numerous glycosylation sites.² GM-CSF production is induced in a variety of cells, including macrophages, T cells, neutrophils, and dendritic cells, by stimulation with pro-inflammatory cytokines, such as IL-1, TNF- α , or IL-12, and is decreased by cell stimulation with the anti-inflammatory cytokines IL-10 or IFN- γ .³ Binding of GM-CSF to the GM-CSF receptor, which is highly expressed on dendritic cells and their precursors, macrophages, and monocytes, promotes cell differentiation, proliferation, and survival and enhances several immunological functions, including chemotaxis, cytokine signaling, phagocytosis, antigen presentation, and pathogen killing.^{1,4} GM-CSF-deficient mice exhibit increased accumulation of pulmonary surfactant and protein and have been used as a model of pulmonary alveolar proteinosis.⁵ Neutralization of GM-CSF with a monoclonal antibody decreases joint cartilage destruction and TNF- α and IL-1 β levels in a mouse model of collagen-induced arthritis.⁶ GM-CSF has been used to generate bone marrow-derived macrophages with a pro-inflammatory phenotype *in vitro*.³ Formulations containing GM-CSF have been used for myeloid cell reconstitution following chemotherapy. Cayman's GM-CSF (human, recombinant) protein can be used for cell-based assay applications. This protein consists of 127 amino acids, has a calculated molecular weight of 14.5 kDa, and a predicted N-terminus of Ala18 after signal peptide cleavage. By SDS-PAGE, under reducing conditions, the apparent molecular mass of the protein is approximately 23.8 kDa due to glycosylation.

References

1. Becher, B., Tugues, S., and Greter, M. GM-CSF: From growth factor to central mediator of tissue inflammation. *Immunity* **45(5)**, 963-973 (2016).
2. Chiarini, R., Moran, O., and Revoltella, R.P. Identification of an antigenic domain near the C terminus of human granulocyte-macrophage colony-stimulating factor and its spatial localization. *J. Biol. Chem.* **279(36)**, 37908-37917 (2004).
3. Ushach, I. and Zlotnik, A. Biological role of granulocyte macrophage colony-stimulating factor (GM-CSF) and macrophage colony-stimulating factor (M-CSF) on cells of the myeloid lineage. *J. Leukoc. Biol.* **100(3)**, 481-489 (2016).
4. Trapnell, B.C. and Whitsett, J.A. GM-CSF regulates pulmonary surfactant homeostasis and alveolar macrophage-mediated innate host defense. *Annu. Rev. Physiol.* **64**, 775-802 (2002).
5. Dranoff, G., Crawford, A.D., Sadelain, M., *et al.* Involvement of granulocyte-macrophage colony-stimulating factor in pulmonary homeostasis. *Science* **264(5159)**, 713-716 (1994).
6. Cook, A.D., Braine, E.L., Campbell, I.K., *et al.* Blockade of collagen-induced arthritis post-onset by antibody to granulocyte-macrophage colony-stimulating factor (GM-CSF): Requirement for GM-CSF in the effector phase of disease. *Arthritis Res.* **3(5)**, 293-298 (2001).

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