Cytokines

Human Recombinant M-CSF

Macrophage colony-stimulating factor

Catalog #	78057.1	10 µg
	78057	100 µg
	78057.2	1000 µg

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Product Description

Macrophage colony-stimulating factor (M-CSF) is a homodimeric glycoprotein growth factor that regulates proliferation and differentiation of myeloid hematopoietic progenitor cells to mononuclear phagocytic cell lineages, including monocytes, macrophages, and osteoclasts. M-CSF is a crucial factor for the development of tissue-resident macrophages in most tissues (Ginhoux & Jung). It is required for the maturation and activation of monocytes and macrophages, and regulates inflammatory responses in conjunction with other stimuli such as IFN-γ, LPS, and IL-4 (Murray et al.). M-CSF is also required for bone resorption by osteoclasts, and is involved in the development and regulation of the placenta, mammary gland, and brain. M-CSF is produced by monocytes, fibroblasts, osteoclasts, stromal cells, endothelial cells, and tumor cells (Chockalingam & Ghosh).

M-CSF exerts its biological effects by signaling through a receptor tyrosine kinase (CSF-1R or M-CSF-R) encoded by the c-fms proto-oncogene (Hamilton). CSF-1R shares similar structural features with other growth factor receptors, including the stem cell factor (SCF) receptor, platelet-derived growth factor receptor (PDGF-R), and Flt3/Flk-2 receptor tyrosine kinase. Stimulation of the CSF-1R upon binding to M-CSF activates MAPK, PI3K, and PLCγ signaling pathways (Chockalingam & Ghosh). Human and mouse M-CSF sequences are highly conserved both at nucleotide and amino acid levels (80% homology; DeLamarter et al.).

Product Information

Alternative Names:	Colony stimulating factor 1, CSF-1
Accession Number:	P09603
Amino Acid Sequence:	MEEVSEYCSH MIGSGHLQSL QRLIDSQMET SCQITFEFVD QEQLKDPVCY LKKAFLLVQD IMEDTMRFRD NTPNAIAIVQ LQELSLRLKS CFTKDYEEHD KACVRTFYET PLQLLEKVKN VFNETKNLLD KDWNIFSKNC NNSFAECSSQ GHERQSEGS
Predicted Molecular Mass:	18.5 kDa monomer; 37.1 kDa dimer
Species:	Human
Cross Reactivity:	Mouse
Formulation:	Lyophilized from a sterile-filtered aqueous solution containing sodium phosphate and sodium chloride, pH 8.0.
Source:	E. coli

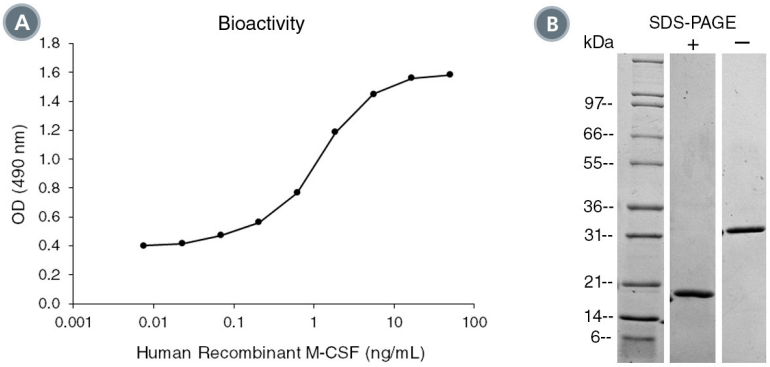
Specifications

Activity:	The EC50 is ≤ 10 ng/mL as determined by a cell proliferation assay using NFS-60 cells. The specific activity is approximately 1.02 x 10^5 IU/µg as calibrated against the human recombinant M-CSF WHO International Standard (NIBSC code: 89/512).
Purity:	≥ 95%
Endotoxin Level:	Measured by kinetic Limulus amebocyte lysate (LAL) analysis and is ≤ 1 EU/µg protein.

Preparation and Storage

Storage:	Store at -20°C to -80°C.
Stability:	Stable as supplied for 12 months from date of receipt.
Preparation:	Centrifuge vial before opening. Reconstitute the product in sterile water to at least 0.1 mg/mL by pipetting the solution down the sides of the vial. Do not vortex. OPTIONAL: After reconstitution, if product will not be used immediately, dilute with concentrated bovine serum albumin (BSA) to a final BSA concentration of 0.1%. The effect of storage of stock solution on product performance should be tested for each application. As a general guide, do not store at 2 - 8°C for more than 1 month or at -80°C for more than 3 months. Avoid repeated freeze-thaw cycles.

Data



(A) The biological activity of Human Recombinant M-CSF was tested by its ability to promote the proliferation of NFS-60 cells. Cell proliferation was measured after 44 hours of culture using a fluorometric assay method. The EC50 is defined as the effective concentration of the growth factor at which cell proliferation is at 50% of maximum. The EC50 in the above example is 0.9 - 1.4 ng/mL.
(B) 1 µg of Human Recombinant M-CSF was resolved with SDS-PAGE under reducing (+) and non-reducing (-) conditions and visualized by Coomassie Blue staining. Human Recombinant M-CSF is a homodimer of 18.5 kDa subunits with a predicted total molecular mass of 37.1 kDa.

Related Products

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References

Chockalingam S & Ghosh SS. (2014) Macrophage colony-stimulating factor and cancer: a review. Tumour Biol 35(11): 10635–44.
DeLamarter JF et al. (1987) Nucleotide sequence of a cDNA encoding murine CSF-1 (Macrophage-CSF). Nucleic Acids Res 15(5): 2389–90.
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Hamilton JA. (1997) CSF-1 signal transduction. J Leukoc Biol 62(2): 145–55.
Murray PJ et al. (2014) Macrophage Activation and Polarization: Nomenclature and Experimental Guidelines. Immunity 41(1): 14–20.