



Recombinant Human Granulocyte-Macrophage Colony Stimulating Factor (GM-CSF)

PRODUCT ANALYSIS SHEET

Catalog Number:	PHC2014	PHC2015	PHC2011	PHC2013
Quantity:	2 µg	10 µg	100 µg	1 mg

Lot Number:	See product label
Molecular Weight:	14 kDa
Purity:	>95% as determined by SDS-PAGE analysis.
Biological Activity:	ED ₅₀ range = 0.02 to 0.1 ng/mL, determined by the dose dependent proliferation of human TF-1 cells. Optimal concentration for individual application should be determined by a dose response assay.
Formulation:	Lyophilized, carrier free.
Sterility:	Filtered prior to lyophilization through a 0.22 micron sterile filter.
Endotoxin:	<0.1 ng/µg
Production:	Recombinant human GM-CSF is produced in <i>E. coli</i> and purified via sequential chromatography.
Reconstitution Recommendation:	We recommend that the vial be briefly centrifuged prior to opening to bring the contents to the bottom. Lyophilized recombinant human GM-CSF should be reconstituted in sterile, distilled water to 0.1-1.0 mg/mL to regain full activity. These stock solutions should be apportioned into working aliquots and stored at ≤ -20°C. Further dilutions should be made in medium or buffered solution containing carrier protein, such as PBS with 0.1% BSA.
Suggested Working Dilutions:	The optimal concentration should be determined for each specific application.
Storage:	Lyophilized human GM-CSF should be stored at 2-8°C, preferably desiccated. Store reconstituted human GM-CSF at ≤ -20°C (not in a frost-free freezer). Keep freeze-thaw cycles to a minimum.
Expiration Date:	Expires one year from date of receipt when stored as instructed.

This product is for research use only. Not for use in diagnostic procedures.

www.invitrogen.com

Invitrogen Corporation - Carlsbad - CA 92008 - Tel: 800.955.6288 - E-mail: techsupport@invitrogen.com

References:

Callard, R.E. and A.J. Gearing (1994) *The Cytokine Fact Book*. pp. 139-140. Academic Press Inc. San Diego, CA.

Gubina, E., X. Luo, E. Kwon, K. Sakamoto, Y.F. Shi, and R.A. Mufson (2001) β c cytokine receptor-induced stimulation of cAMP response element binding protein phosphorylation requires protein kinase C in myeloid cells: A novel cytokine signal transduction cascade. *J. Immunol.* 167(8):4303-4310.

Kahlert, H., E. Grage-Griebenow, H.T. Stuwe, O. Cromwell, and H. Fiebig (2000) T cell reactivity with allergoids: Influence of the type of APC. *J. Immunol.* 165(4):1807-1815.

Rogers, J.A., H.Y. Cheng, and T.E. Smithgall (2000) Src homology domain 2 substitution modulates the kinase and transforming activities of the Fes protein-tyrosine kinase. *Cell Growth and Differentiation* 11:581-592.

Shay, A.H., R. Choi, K. Whittaker, K. Salehi, C.M.R. Kitchen, D.P. Tashkin, M.D. Roth and G.C. Baldwin (2003) Impairment of antimicrobial activity and nitric oxide production in alveolar macrophages from smokers of marijuana and cocaine. *J. Infect. Dis.* 187(4):700-704.

Yu, W.G., J. Cassara, and P.F. Weller (2000) Phosphatidylinositol 3-kinase localizes to cytoplasmic lipid bodies in human polymorphonuclear leukocytes and other myeloid-derived cells. *Blood* 95:1078-1085.

Yu, Y., M. Hagihara, K. Ando, B. Gansuvd, H. Matsuzawa, T. Tsuchiya, Y. Ueda, H. Inoue, T. Hotta, and S. Kato (2001) Enhancement of human cord blood CD34(+) cell-derived NK cell cytotoxicity by dendritic cells. *J. Immunol.* 166(3):1590-1600.

This product is for research use only. Not for use in diagnostic procedures.

www.invitrogen.com

Invitrogen Corporation - Carlsbad - CA 92008 - Tel: 800.955.6288 - E-mail: techsupport@invitrogen.com