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GM CSF Human

Description: Granulocyte Macrophage Colony Stimulating Factor Human Recombinant produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 127 amino acids and having a molecular mass of 14477 Dalton. GM-CSF is purified by proprietary chromatographic techniques.

Synonyms:CSF-2, MGI-1GM, GM-CSF, Pluripoietin-alpha, Molgramostin, Sargramostim, MGC131935, MGC138897.

Source: Escherichia Coli.

Physical Appearance: Sterile Filtered White lyophilized (freeze-dried) powder.

Amino Acid Sequence: The sequence of the first five N-terminal amino acids was determined and was found to be Ala-Pro-Ala-Arg-Ser.N-terminal methionine has been completely removed enzymatically.

Purity: Greater than 98.0% as determined by1. Analysis by RP-HPLC.2. Analysis by SDS-PAGE.

Formulation:
GM-CSF was lyophilized after extensive dialysis against 2mM sodium phosphate buffer pH= 7.4

Stability:
Lyophilized Granulocyte Macrophage Colony Stimulating Factor althoμgh stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution GMCSF should be stored at 4°C between 2-7 days and for future use below -18°C.For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA).Please prevent freeze-thaw cycles.

Usage:
NeoBiolab's products are furnished for LABORATORY RESEARCH USE ONLY. The product may not be used as drμgs, agricultural or pesticidal products, food additives or household chemicals.

Solubility:
It is recommended to reconstitute the lyophilized Granulocyte Macrophage Colony Stimulating Factor in sterile 18M-cm H2O not less than 100μg/ml, which can then be further diluted to other aqueous solutions.

Introduction:
Granulocyte Macrophage Colony Stimulating Factor (GM-CSF) was first characterized as a growth factor that supports the in-vitro colony formation of granulocytes-macrophages progenitor cells (1, 2). It is a pleiotropic cytokine and a member of a family of endogenous cytokines of the hematopoietic system. GM-CSF is produced as a response to immune or inflammatory stimuli by activated cells of the hematopoietic system such as T cells, B cells, macrophages, mast cells and also fibroblasts and alveolar epithelial cells. It plays an important role in regulating the proliferation, differentiation, survival and activation of hematopoietic cells such as granulocytes and monocytes ,neutrophiles, basophiles and eosonophoiles, erythroid cells, megakaryocytes and T cells (3,4).Human and mouse GM-CSF have about 56% homology and are species specific. Human GM-CSF is not active on mouse cells and vice versa. It is active on canine and feline cells (5, 6).GMCSF is 144 amino acids, 22kDa glycoprotein. It is composed of four bundles alpha helices. Its receptor is heterodimers with a ligand-specific alpha subunit and a betac (c) subunit that is

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shared with the interleukin IL-3 and IL-5 receptors. This unusual form of receptor assembly likely applies also to IL-3 and IL-5 receptors. Cross-linking the two receptor subunits is required for receptor activation and signaling (7, 8).GMCSF has been shown to be involved in maturation, mobilization and antigen presentation of myeloid dentritic cells (DCs) in-vivo or ex-vivo. This function promotes Th1 immune responses, cytotoxcity, anti-angiogenesis as well as allergic inflammation, and the development of autoimmunity (9-11). Therefore GMCSF can be used in immunotherapy for the treatment of immune suppressed and immune-compromised patients as well as in veterinary medicine for the same purpose (12-14). GM-CSF is also important in regulation of embryo development and pregnancy and specifically in embryo implantation and subsequent development (15, 16).

Biological Activity:

The ED50 as determined by the dose-dependant stimulation of the proliferation of human TF-1 cells (human erythroleukemic indicator cell line) is < 0.1 ng/ml, corresponding to a Specific Activity of 11,100,000 IU/mg.

References:

1. Title: Disease activity in systemic lupus erythematosus is associated with an altered expression of low-affinity Fc gamma receptors and costimulatory molecules on dendritic cells.Publication: Immunology. 2009 Nov;128(3):334-41. PMID: 2770681.Link: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2770681/Applications: IL-4 and GM-CSF were used to obtain monocyte-derived Dendritic cells(DC) from Human peripheral blood mononuclear cells (PBMCs).2. Title: Generation of Novel Bone Forming Cells (Monoosteophils) from the Cathelicidin-Derived Peptide LL-37 Treated Monocytes.Publication: PLoS One. 2010; 5(11): e13985. Published online 2010 November 15. Link: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2981577/tool=pmcentrezApplications: GM-CSF was used to differentiate monocytes into macrophage and to Monocyte-derived dendtritic cells (DCs) from Peripheral blood mononuclear cells (PBMCs). Osteoclasts, which are derived from monocytes by the action of macrophage colony-stimulating factor (M-CSF) and receptor activator of nuclear factor B ligand (RANKL). Osteoclast were differentiated from monocytes in the presence of RANKL and M-CSF (both at 25 ng/mL).And also for cytokine analysis.3.Title:AIMP1/p43 protein induces the maturation of bone marrow-derived dendritic cells with T helper type 1-polarizing ability.Publication: J Immunol. 2008 Mar 1;180(5):2894-902. PMID: 18292511.Link: http://www.ncbi.nlm.nih.gov/pubmedterm=18292511Applications: Generation of bone marrow DCs.4. Title:Sphingosine kinase regulates the rate of endothelial progenitor cell differentiation.Publication: Blood. 2009 Feb 26;113(9):2108-17. Epub 2008 Dec 24. PMID: 19109558. PMID: 18292511.Link: http://www.ncbi.nlm.nih.gov/pubmedterm=19109558Applications: BM cells at 10,000 were plated in 0.3% agar culture medium containing GM-CSF (100 ng/ml, was used with other cytokines for mouse progenitor cell isolation, culture and colony forming assay.5.Title:Defective IL-10 production in severe phenotypes of Crohns diseasePublication:Published online before print February 23, 2009, doi: 10.1189/jlb.1108698 May 2009 Journal of Leukocyte Biology vol. 85 no. 5 896-903 Link:http://www.jleukbio.org/content/85/5/896.full6.Title:Adenosine deaminase potentiates the generation of effector, memory, and regulatory CD4+ T cells .Publication:Published online before print October 19, 2010, doi: 10.1189/jlb.1009696 January 2011 Journal of Leukocyte Biology vol. 89 no. 1 127-136 Link:http://www.jleukbio.org/content/89/1/127.full7.Title:Glutamate Released by Dendritic Cells as a Novel Modulator of T Cell Activation.Publication:Link:http://journal.9med.net/qikan/article.phpid=3677938.Title:Airway Epithelial Cells Regulate the Functional Phenotype of Locally Differentiating Dendritic Cells: Implications for the Pathogenesis of Infectious and Allergic Airway Disease1.Publication: The Journal of Immunology January 1, 2009 vol. 182 no. 1 72-83

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