

Recombinant Human GM-CSF (rHuGM-CSF)

Acnovia Data Sheet

Catalog#/Size:	AC52378/100 µg.
Source:	<i>Escherichia coli</i> .
Molecular Weight:	Approximately 14 kDa, a single non-glycosylated polypeptide chain containing 128 amino acids.
Description :	Accession # P04141.1, Ala18-Glu144, with an N terminal Ser.
SDS-PAGE:	14 kDa, under reducing conditions
Purity:	>95 %, as determined by SDS-PAGE, under reducing non-reducing conditions, visualized by coomassie staining.
Endotoxin:	Less than 0.01 EU/µg of rHuGM-CSF as determined by kinetic Limulus Amoebocyte Lysate (LAL) assay.
Biological Activity:	Recombinant human GM-CSF bioactivity is measured by TF-1 human erythroleukemic cells, the EC50 for this effect is 0.02988 to 0.05326 ng/mL.
Physical Appearance:	Sterile Filtered White lyophilized (freeze-dried) powder.
Formulation:	Lyophilized from a 0.2 µm filtered solution in PBS with Trehalose.
Reconstitution:	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Reconstitute to a concentration of 0.1-1.0 mg/mL in sterile distilled H₂O . Stock solutions should be apportioned into working aliquots and stored at -20 °C to -70 °C. Further dilutions should be made in appropriate buffered solutions. Do not reconstitute in cell culture media directly.
Shipping:	The product is shipped at 2 °C to 8 °C. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage:	Use a manual defrost freezer and avoid repeated freeze-thaw cycles. A minimum of 12 months from date of shipping when stored at -20 °C to -70 °C as supplied. 4 weeks at 2 °C to 8 °C under sterile conditions after reconstitution. 4 months at -20 °C to -70 °C under sterile conditions after reconstitution.
Usage:	Acnovia rHuGM-CSF product can be used for a variety of ex vivo cell culture applications such as research or further manufacturing.
Quality statement:	No animal- or human-derived materials were used for the manufacture of this product, unless otherwise stated in the respective Certificate of Origin.

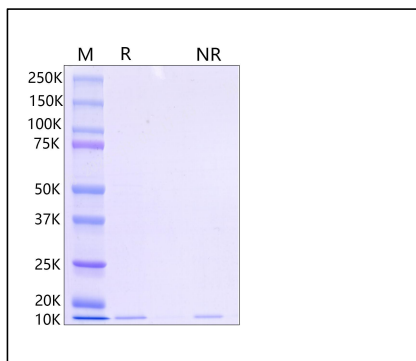
Background:

Granulocyte-macrophage colony-stimulating factor (GM-CSF) was identified in the 1960s as a myeloid growth factor, purified in the 1970s, molecularly-cloned in the 1980s, and clinically developed in the 1990s⁽¹⁾. GM-CSF is produced by multiple cell types such as activated T cells, B cells, macrophages, monocytes, mast cells, vascular endothelial cells, and fibroblasts. GM-CSF receptor is composed of one α chain and one β chain with low and high-affinity binding to GM-CSF, respectively, and the β chain is shared with IL-3 and IL-5 receptor⁽²⁾. In addition, the GM-CSF receptor (CSF2R) is found in myeloid cells and some non-hematopoietic cells, but it is not expressed by lymphoid cells such as T cells. There are four main signaling pathways triggered by CSF2R⁽³⁾. After binding of GM-CSF to its receptor, Janus-kinase-2 (JAK-2) is recruited to the cytoplasmic domain of the β chain, and activation of JAK-2 occurs, which subsequently induces STAT-5 phosphorylation. This signaling pathway induces migration of STAT-5 dimers to the nucleus and promotes the transcription of various genes such as pim-1 and CIS to induce cell differentiation. In addition to the important role of GM-CSF as a colony-stimulating factor and its clinical application following chemo/radiotherapy to restore myeloid populations in leukemic patients, several studies suggest that GM-CSF plays a role in innate and adaptive immunity. Accumulating evidence indicates the role of this molecule in inflammatory immune response and autoimmunity.

Application References:

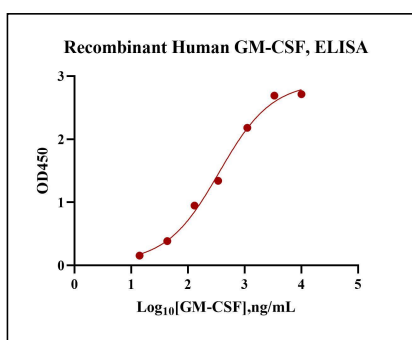
1. Burgess AW, Metcalf D. The nature and action of granulocyte-macrophage colony stimulating factors. *Blood*. (1980); 56:947-58.
2. Hansen G, Hercus TR, McClure BJ, Stomski FC, Dottore M, Powell J, *et al.*. The structure of the GM-CSF receptor complex reveals a distinct mode of cytokine receptor activation. *Cell*. (2008) 134:496-507.
3. van de Laar L, Coffey PJ, Woltman AM. Regulation of dendritic cell development by GM-CSF: molecular control and implications for immune homeostasis and therapy. *Blood*. (2012) 119:3383-93. 10.1182/blood-2011-11-370130.

DATA:



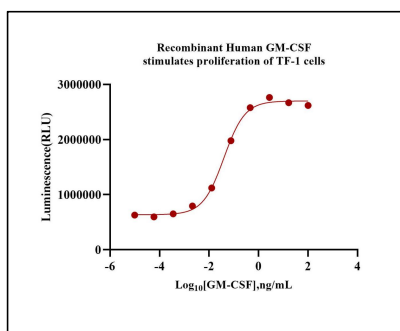
SDS-PAGE

Recombinant Human GM-CSF Protein SDS-PAGE 1 μ g/lane of Recombinant Human GM-CSF (Catalog #AC52378) was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions visualized by coomassie staining showing a single band at about 14 kDa.



Bioactivity-ELISA

Immobilized Recombinant Human GM-CSF (Catalog #AC52378) at 0.2 μ g/well can bind Human GM-CSF R alpha with a linear range of 107.2 to 823.9 ng/mL.



Bioactivity-Cell based assay

Recombinant human GM-CSF (Catalog #AC52378) stimulates proliferation of TF-1 human erythroleukemic cells, the EC₅₀ for this effect is 0.02988 to 0.05326 ng/mL.