

Recombinant Human GM-CSF Protein

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| Catalog Number: | 630601, 630602 |
| Size: | 20 µg, 100 µg |
| Target Name: | GM-CSF, GMCSF, CSF Protein, |
| Regulatory Status: | RUO |

PRODUCT DETAILS

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| Application: | Bioassay |
| Format: | Lyophilized from sterile PBS, pH 7.4. |
| Expression Host: | HEK293 |
| Species: | Human |
| accession number: | NP_000749.2 |
| Sources: | A DNA sequence encoding human GMCSF (NP_000749.2) (Met1-Glu144) was expressed. |
| Molecular Weight: | The recombinant human GMCSF consists of 127 amino acids and predicts a molecular mass of 14.5 kDa. As a result of glycosylation, it migrates as an approximately 19-29 kDa band in SDS-PAGE under reducing conditions. |
| Affinity Tag: | None |
| Purity: | ≥ 95 % as determined by SDS-PAGE. ≥ 95 % as determined by SEC-HPLC. |
| Endotoxin level: | |
| Protein Concentration: | Lyophilized |
| Storage and Handling: | Proteins are stable for up to twelve months from date of receipt at -20°C to -80°C. Store it under sterile conditions at -20°C to -80°C. It is recommended that the protein be aliquoted for optimal storage. Avoid repeated freeze-thaw cycles. |

BACKGROUND INFORMATION

Human granulocyte-macrophage colony-stimulating factor (GM-CSF), also known as CSF-2, is a multifunctional cytokine that regulates the production, differentiation, and activation of myeloid lineage cells, including granulocytes, macrophages, and dendritic cells. It is produced by T cells, macrophages, endothelial cells, and fibroblasts in response to immune stimuli. GM-CSF enhances antigen presentation, promotes inflammatory responses, and supports host defense by stimulating the functional activity of mature immune cells.

Structurally, GM-CSF is a single-chain glycoprotein with a four α -helical bundle typical of many cytokines. It functions by binding to the GM-CSF receptor, a heterodimer composed of a specific α chain (CSF2RA) and a shared β common chain (β c, CD131), which is also utilized by IL-3 and IL-5 receptors. Ligand binding induces receptor dimerization and activation of intracellular signaling pathways, including JAK2/STAT5, MAPK, and PI3K/AKT, leading to cell survival, proliferation, and activation. GM-CSF itself acts as the primary ligand for its receptor.

Dysregulated GM-CSF signaling is implicated in inflammatory and autoimmune diseases such as rheumatoid arthritis, multiple sclerosis, and pulmonary alveolar proteinosis. Elevated GM-CSF levels can drive chronic inflammation, while impaired signaling may compromise immune defense. Therapeutically, recombinant GM-CSF is used to stimulate white blood cell recovery following chemotherapy or bone marrow transplantation. Conversely, GM-CSF-neutralizing antibodies and receptor antagonists are being developed to treat inflammatory disorders by dampening excessive immune activation.

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