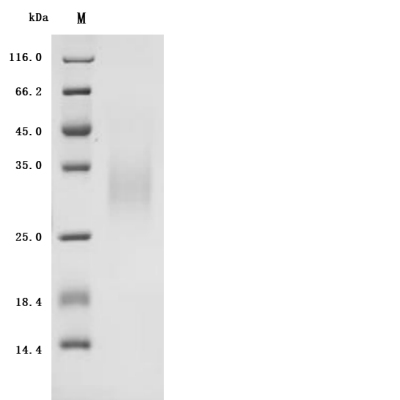
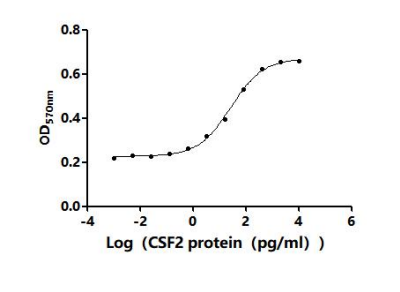
Recombinant Human Granulocyte-macrophage colony-stimulating factor (CSF2) (Active)

Product Code	CSB-YP006045HU
Abbreviation	Recombinant Human CSF2 protein (Active)
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P04141
Form	Lyophilized powder
Storage Buffer	Lyophilized from a 0.2 μm filtered PBS, 6% Trehalose, pH 7.4
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Biological Activity	The ED50 as determined by the dose-dependent stimulation of the proliferation of human TF-1 cells is 21.07-35.48 pg/mL.
Purity	Greater than 95% as determined by SDS-PAGE.
Sequence	APARSPSPSTQPWEHVNAIQEARRLLNLSRDTAAEMNETVEVISEMFDLQEPTCLQTRLELYKQGLRGSLTKLKGPLTMMASHYKQHCPPTPETSCATQIITFESFKENLKDFLLVIPFDCWEPVQE
Source	Yeast
Target Names	CSF2
Expression Region	18-144aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	17.1 kDa
Protein Length	Full Length of Mature Protein
Image	



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.



Activity
The ED_{50} as determined by the dose-dependent stimulation of the proliferation of human TF-1 cells is 21.07-35.48 pg/mL.

Description

The recombinant human CSF2 protein is produced using a yeast expression system. Its expression region corresponds to the amino acids 18 to 144 of the full-length mature human CSF2 protein. This recombinant human CSF2 protein is N-terminally tagged with a 6xHis-tag for easy detection and purification. It has a purity of over 95%, as confirmed by SDS-PAGE, and contains less than 1.0 EU/μg endotoxin, as determined by the LAL method. The recombinant CSF2 protein shows strong biological activity, with an ED_{50} value of 21.07-35.48 pg/mL, measured by its ability to stimulate the proliferation of human TF-1 cells in a dose-dependent manner.

Human CSF2 is a crucial cytokine produced by various cells, including macrophages, fibroblasts, and endothelial cells. It plays a multifaceted role in regulating hematopoiesis, immune response, and tissue repair. CSF2 stimulates the proliferation, differentiation, and survival of myeloid progenitor cells, which include granulocytes and monocytes, thereby influencing the immune system's capacity to respond to pathogens and inflammation [1][2]. CSF2 is also involved in tissue repair and regeneration. Studies have shown that CSF2 enhances the expression of extracellular matrix proteins and promotes keratinocyte proliferation, which is vital for wound healing. CSF2 has protective effects on embryonic development, as it can inhibit apoptosis in preimplantation embryos, suggesting its role in early developmental processes [3].

CSF2 acts through specific receptors, primarily the CSF2R, which activates several intracellular signaling pathways, including the JAK-STAT pathway, MAPK pathway, and PI3K-AKT pathway, which are critical for mediating the effects of CSF2 on cell proliferation, differentiation, and survival [1][4][5][6].

CSF2 is implicated in various pathological conditions, including inflammatory

diseases and cancers. Its expression can be upregulated in response to inflammatory stimuli, leading to increased production of pro-inflammatory cytokines [7]. In the context of cancer, CSF2 can promote tumor cell survival and proliferation through its signaling pathways, making it a potential target for therapeutic intervention [1][7].

References:
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[4] M. Zhang, F. Liu, P. Zhou, Q. Wang, C. Xu, Y. Li, et al. The mtor signaling pathway regulates macrophage differentiation from mouse myeloid progenitors by inhibiting autophagy, Autophagy, vol. 15, no. 7, p. 1150-1162, 2019. https://doi.org/10.1080/15548627.2019.1578040
[5] L. Xiong, J. Cao, S. Chen, M. Wu, C. Wang, H. Xu, et al. Exploring the mechanism of action of xuanfei baidu granule (xfbd) in the treatment of covid-19 based on molecular docking and molecular dynamics, Frontiers in Cellular and Infection Microbiology, vol. 12, 2022. https://doi.org/10.3389/fcimb.2022.965273
[6] Y. Lee, W. Wu, C. Huang, C. Li, W. Li, B. Yeh, et al. Csf2 overexpression is associated with stat5 phosphorylation and poor prognosis in patients with urothelial carcinoma, Journal of Cancer, vol. 7, no. 6, p. 711-721, 2016. https://doi.org/10.7150/jca.14281
[7] X. He, L. Wang, H. Li, Y. Liu, C. Tong, C. Xie, et al. Csf2 upregulates cxcl3 expression in adipocytes to promote metastasis of breast cancer via the fak signaling pathway, Journal of Molecular Cell Biology, vol. 15, no. 4, 2023. https://doi.org/10.1093/jmcb/mjad025

Endotoxin	Less than 1.0 EU/ug as determined by LAL method.
Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.
Shelf Life	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.