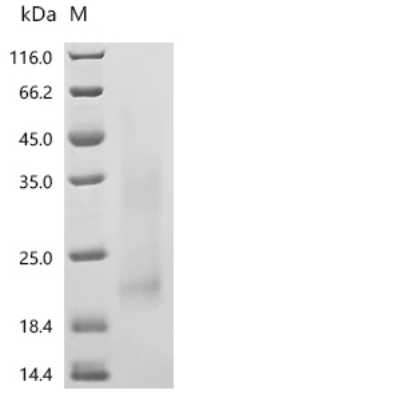
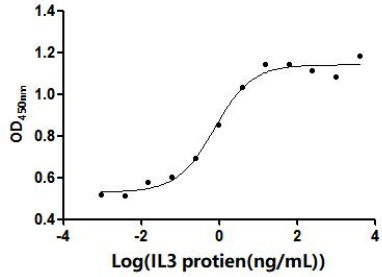
Recombinant Human Interleukin-3 (IL3) (Active)

Product Code	CSB-YP011652HUd7
Abbreviation	Recombinant Human IL3 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.	P08700
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 TF-1 cells is 0.4476-1.272 ng/mL.
Sequence	APMTQTTPLKTSWVNCSNMIDEIITHLKQPPLPLLDFNNLNGEDQDILMENNLR RPNLEAFNRAVKSLQNASAIESILKNLLPCLPLATAAPTRHPIHIKDGDWNEFRR KLTFYLKTLENAQAQQTTLSLAIF
Source	Yeast
Target Names	IL3
Expression Region	20-152aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	C-terminal 10xHis-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 TF-1 cells is 0.4476-1.272 ng/mL.

Description

This recombinant human IL3 is an active cytokine produced in yeast expression systems, covering amino acids 20 to 152 of the native IL3 sequence. It features a C-terminal 10xHis tag, which facilitates purification and analytical applications. This recombinant IL3 protein maintains low endotoxin levels, with less than 1.0 EU/μg as verified by the LAL assay. Its bioactivity is confirmed by its ability to promote TF-1 cell proliferation in a dose-dependent manner, showing an ED_{50} in the range of 0.4476 to 1.272 ng/mL, indicating strong functional potency.

Human IL3 is a cytokine that plays a pivotal role in hematopoiesis and immune responses. It is primarily produced by T-cells. IL3 has several critical functions, including cell proliferation, survival, and differentiation. IL3 achieves these functions by binding to its receptor, which consists of two subunits: IL3 receptor alpha (IL3RA) and beta (IL3RB) [1][2]. This receptor engagement activates multiple intracellular signaling pathways, including the JAK/STAT, MAPK, and PI3K/AKT pathways, influencing various physiological processes.

One of the established roles of IL3 is in promoting the proliferation and survival of hematopoietic progenitor cells and certain immune cells, like dendritic cells. For instance, IL3 is a key cytokine that supports the generation of dendritic cells from precursor cells, fostering T helper 2 (Th2) responses [3]. The active signaling through the MAPK pathway has been shown to regulate cell proliferation, as evidenced by its co-expression with cell proliferation markers like Ki67 [4]. Additionally, IL3 signaling has been implicated in surfactant homeostasis in the lungs, suggesting its importance beyond hematopoietic contexts [5].

Moreover, the involvement of IL3 in pathological conditions such as cancer has been documented extensively. High-affinity binding of IL3 to its receptor induces significant events necessary for cellular activation and function, including the survival and proliferation of malignant cells [6]. Notably, IL3 receptor expression is prevalent in several myeloid leukemias, which has led to the development of targeted therapies using recombinant fusion proteins incorporating IL3 to selectively kill leukemic cells [7][8]. These therapeutic strategies often exploit the expression of IL3RA on cancerous cells, thus validating the receptor as a promising target in various hematological malignancies [9].

In the context of autoimmune diseases and psychiatric disorders, polymorphisms in the IL3 gene have been associated with increased susceptibility to conditions such as Graves' disease and schizophrenia [3][10]. Notably, IL3 signaling pathways have been implicated in the pathophysiology of

schizophrenia, with evidence suggesting that alterations in IL3RA are linked to the disease. This highlights the cytokine's dual role as both an essential participant in normal immune functions and a player in the development of certain disorders [11].

References:
[1] S. Hou, T. Gu, et al. Correlation between il3 signaling pathway-related genes and immune checkpoint inhibitor efficacy in patients with renal cell carcinoma. Cancer Biomarkers, vol. 38, no. 4, p. 489-504, 2023. https://doi.org/10.3233/cbm-230226
[2] S. Broughton, U. Dhagat, et al. The gm–csf/il?3/il?5 cytokine receptor family: from ligand recognition to initiation of signaling. Immunological Reviews, vol. 250, no. 1, p. 277-302, 2012. https://doi.org/10.1111/j.1600-065x.2012.01164.x
[3] X. Chu, C. Dong, et al. Polymorphisms in the interleukin 3 gene show strong association with susceptibility to graves' disease in chinese population. Genes and Immunity, vol. 10, no. 3, p. 260-266, 2009. https://doi.org/10.1038/gene.2009.3
[4] X. Luo, M. Li, L. et al. The interleukin 3 gene (il3) contributes to human brain volume variation by regulating proliferation and survival of neural progenitors. Plos One, vol. 7, no. 11, p. e50375, 2012. https://doi.org/10.1371/journal.pone.0050375
[5] A. Cordero, S. Milne, et al. Integrative omics reveal novel protein targets for chronic obstructive pulmonary disease biomarker discovery., 2021. https://doi.org/10.1101/2021.01.11.21249617
[6] S. Franceschi, F. Lessi, et al. Cancer astrocytes have a more conserved molecular status in long recurrence free survival (rfs) idh1 wild-type glioblastoma patients: new emerging cancer players. Oncotarget, vol. 9, no. 35, p. 24014-24027, 2018. https://doi.org/10.18632/oncotarget.25265
[7] A. Frankel, J. McCubrey, et al. Diphtheria toxin fused to human interleukin-3 is toxic to blasts from patients with myeloid leukemias. Leukemia, vol. 14, no. 4, p. 576-585, 2000. https://doi.org/10.1038/sj.leu.2401743
[8] H. Horita, A. Frankel, & A. Thorburn. Acute myeloid leukemia-targeted toxins kill tumor cells by cell type-specific mechanisms and synergize with trail to allow manipulation of the extent and mechanism of tumor cell death. Leukemia, vol. 22, no. 3, p. 652-655, 2007. https://doi.org/10.1038/sj.leu.2404956
[9] J. Sullivan and D. Rizzieri. Treatment of blastic plasmacytoid dendritic cell neoplasm. Hematology, vol. 2016, no. 1, p. 16-23, 2016. https://doi.org/10.1182/asheducation-2016.1.16
[10] X. Chen, X. Wang, et al. Interleukin 3 and schizophrenia: the impact of sex and family history. Molecular Psychiatry, vol. 12, no. 3, p. 273-282, 2006. https://doi.org/10.1038/sj.mp.4001932
[11] Q. Chen, X. Wang, et al. Association study of csf2rb with schizophrenia in irish family and case – control samples. Molecular Psychiatry, vol. 13, no. 10, p. 930-938, 2007. https://doi.org/10.1038/sj.mp.4002051

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.