

Recombinant Human Interleukin-4 (IL-4), Animal Component-Free

Cat. No. :	H007C
Alternative Names:	IL4; IL-4; Interleukin-4; Interleukin 4; B-cell stimulatory factor 1; BSF-1; Binetrakin; Lymphocyte stimulatory factor 1; Pitrakirra
Species:	Human
Accession No.:	P05112
Expression System:	CHO
Protein Sequence:	His25-Ser153
Theoretical MW:	14.96 kDa
Theoretical pI:	9.26
Tag:	Tag-Free.
Formulation buffer:	PBS, 5% Mannitol and 0.01% Tween 80, pH7.4.
Appearance:	Lyophilized Powder.
Purity:	≥95% as determined by SDS-PAGE.
Bioactivity:	As determined by a TF-1 cell-based proliferation assay, its ED ₅₀ is ≤ 0.2 ng/mL, corresponding to a specific activity of >1 × 10 ⁷ units/mg.
Endotoxin Level:	≤0.01 EU/μg, as determined by the LAL assay.
Application:	Cell Culture; Activity Assays.

Preparation & Storage

Reconstitution: Reconstitute with sterile double-distilled water (ddH₂O).

- ⚠ Centrifuge the vial briefly before opening to ensure full recovery of the solution. Avoid vortexing and minimize vigorous pipetting to maintain protein stability.
- ❄ Immediately aliquot the reconstituted protein solution and store under recommended conditions. Avoid repeated freeze-thaw cycles.

Shipping: Shipped on dry ice. Short-term transit on cold packs (2-8°C) is acceptable.

Storage: Use a manual defrost freezer and avoid repeated freeze-thaw cycles.

- 12 months from date of receipt, -20 to -80°C as supplied.
- 2-7 days at 2 to 8°C under sterile conditions after reconstitution.
- 3-6 months at -20 to -80°C under sterile conditions after reconstitution.

Protein Description

Background: Interleukin-4 (IL-4) is a 14-15 kDa cytokine primarily secreted by activated Th2 cells, mast cells, basophils, and type 2 innate lymphoid cells (ILC2s). First identified in 1982 as a T cell-derived B cell growth factor, IL-4 signals through two receptor complexes:

- Type I receptor (IL-4Rα/γc): Predominant on hematopoietic cells
- Type II receptor (IL-4Rα/IL-13Rα1): Expressed on non-hematopoietic cells

As a master regulator of type 2 immunity, IL-4 drives:

- Th2 differentiation of naïve CD4⁺ T cells
- B cell class-switching to IgE and IgG4
- Alternative (M2) macrophage activation
- Mucin production and tissue repair

Its signaling occurs predominantly via JAK1/3-STAT6 pathways. Dysregulated IL-4 activity is implicated in allergic disorders, fibrosis, and tumor microenvironment modulation. Therapeutic blockade of IL-4Rα (e.g., Dupilumab®) is clinically validated for atopic diseases.

References:

- Nelms K, et al. The IL-4 receptor: signaling mechanisms and biologic functions. *Annu Rev Immunol.* 1999;17:701-38.
- Le HV, et al. Isolation and characterization of multiple variants of recombinant human interleukin-4 expressed in mammalian cells. *J Biol Chem.* 1988;263(22):10817-23.
- Howard M, et al. Identification of a T cell-derived B cell growth factor distinct from interleukin 2. *J Exp Med.* 1982;155(3):914-23.

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