

# Human IL-4

## research grade

5 µg	130-093-915
10 µg	130-095-373
25 µg	130-093-917
100 µg	130-094-117

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### 1. Description

<b>Components</b>	Human IL-4, research grade: Purified recombinant human interleukin 4.
<b>Sizes</b>	5 µg, 10 µg, 25 µg, 100 µg.
<b>Biological activity</b>	The ED <sub>50</sub> is ≤0.5 ng/mL* corresponding to a specific activity of ≥2×10 <sup>6</sup> IU/mg.
<b>Primary structure</b>	Single, non-glycosylated polypeptide chain (130 amino acid residues).
<b>Molecular mass</b>	15.1 kDa.
<b>Source</b>	Produced in <i>E. coli</i> .
<b>Product format</b>	Lyophilized from a 0.2 µm filtered buffer solution.
<b>Stabilizer</b>	Trehalose or trehalose and mannitol.
<b>Purity</b>	>97% as determined by SDS-PAGE analysis.
<b>Endotoxin level</b>	Low endotoxin (<1.0 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.
<b>Storage</b>	Lyophilized Human IL-4, research grade should be stored at -20 °C. The expiration date is indicated on the vial label. Upon reconstitution aliquots should be stored at -20 °C or below. Avoid repeated freeze-thaw cycles.
<b>Reconstitution</b>	It is recommended to reconstitute lyophilized Human IL-4 with deionized sterile-filtered water to a final concentration of 0.1–1.0 mg/mL in a minimal volume of 100 µL. Further dilutions should be prepared with 0.1% bovine serum albumin (BSA) or human serum albumin (HSA) in phosphate-buffered saline.

\*The ED<sub>50</sub> is determined by proliferation assay using TF-1 cells, according to Kitamura *et al.*<sup>1</sup> The proliferation assay was calibrated with the international standard for human IL-4 (NIBSC code 88/656) provided by the WHO/National Institute for Biological Standards and Control.

### 1.1 Background information

Human interleukin 4 (IL-4) is a pleiotropic cytokine that plays a central role in humoral and adaptive immune responses. IL-4 is predominantly secreted by activated CD4<sup>+</sup> memory and effector Th2 cells, basophils, and mast cells. It promotes the proliferation and differentiation of B cells, as well as immunoglobulin isotype switching, and MHC class II antigen and low affinity IgE receptor expression. Furthermore, IL-4 induces the differentiation of naive CD4<sup>+</sup> T cells into helper Th2 cells, while suppressing Th1 development, and promotes chemotaxis of mast cells and basophils. Excessive IL-4 production and mechanisms involving Th2 types have been associated with immunological disorders such as IgE-mediated allergy.

### 1.2 Applications

Human IL-4 can be used for a variety of applications, including:

- *In vitro* generation of Mo-DCs (e.g. together with GM-CSF)<sup>2</sup>.
- *In vitro* differentiation of naive CD4<sup>+</sup> T cells towards Th2 cells<sup>3</sup>.

Optimal concentration for a specific application should be determined by a dose-response experiment.

### 2. References

1. Kitamura, T. *et al.* (1991) IL-1 up-regulates the expression of cytokine receptors on a factor-dependent human hemopoietic cell line, TF-1. *Int. Immunol.* 3: 571–577.
2. Kandler, K. *et al.* (2006) The anti-microbial peptide LL-37 inhibits the activation of dendritic cells by TLR ligands. *Int. Immunol.* 18: 1729–1736.
3. Zhu, J. *et al.* (2006) Gfi-1 plays an important role in IL-2-mediated Th2 cell expansion. *Proc. Natl. Acad. Sci. USA* 103: 18214–18219.

All protocols and data sheets are available at [www.miltenyibiotec.com](http://www.miltenyibiotec.com).

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