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1. Description

Products	Human IL-12, premium grade. Recombinant human interleukin 12.								
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Content in µg	Order no.								
5	130-096-704								
25	130-096-705								
100	130-096-798								
Biological activity	<p>The ED₅₀ is ≤0.33 ng/mL corresponding to an activity of ≥3×10⁶ U/mg. Lot-specific activities are stated in the Certificate of Analysis (www.miltenyibiotec.com/certificates).</p> <p>▲ Note: The ED₅₀ is determined by inducing of IFN-γ secretion by PHA-activated T cells.¹ The proliferation assay was calibrated with the reference reagent for human IL-12 (NIBSC code 95/544) provided by the WHO/National Institute for Biological Standards and Control.</p>								
Primary structure	Glycosylated single-chain polypeptide, p35 and p40 fused by a flexible linker region (531 amino acid residues).								
Molecular mass	60 kDa (calculated). 80 kDa (SDS-PAGE under reducing conditions).								
Source	Produced in HEK293 cells.								
Product format	Lyophilized from a filtered (0.2 µm) buffer solution.								
Stabilizer	Mannitol and trehalose.								
Purity	>97% as determined by SDS-PAGE analysis.								
Endotoxin level	Low endotoxin (<0.1 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.								
Storage	Lyophilized Human IL-12, premium 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.								

Reconstitution It is recommended to reconstitute lyophilized Human IL-12, premium grade with deionized sterile-filtered water to a final concentration of 0.05–1.0 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.

1.1 Background information

Interleukin 12 (IL-12) is a heterodimeric proinflammatory cytokine and a modulator of cell-mediated immunity, which is mainly produced by macrophages, dendritic cells, and B cells. IL-12 stimulates the production and secretion of several cytokines, in particular IFN-γ, by NK cells and T cells, induces proliferation, and enhances the cytotoxic activity within these cell populations. Another important activity of IL-12, acting together with IFN-γ and IL-2, is to drive T helper cell responses toward the T_H1 rather than the T_H2 phenotype. Moreover, IL-12 is also important in resistance to viral disease and has significant antitumor activity. It has been shown that single chain fusion proteins of naturally occurring heterodimeric cytokines such as IL-12 or IL-23 are bioactive *in vitro* and *in vivo*.

1.2 Applications

Human IL-12 can be used for a variety of applications, including:

- *In vitro* differentiation of naive CD4⁺ T cells towards T_H1 cells.
- *In vitro* proliferation and stimulation of cytotoxic activity of NK cells and T cells.

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

2. References

1. Wulff, H. *et al.* (2007) Cloning and characterization of an adenoviral vector for highly efficient and doxycycline-suppressible expression of bioactive human single-chain interleukin 12 in colon cancer. *BMC Biotechnol.* 7: 35.
2. Lieschke, G.J. *et al.* (1997) Bioactive murine and human interleukin-12 fusion proteins which retain antitumor activity *in vivo*. *Nat. Biotechnol.* 15: 35–40.
3. Miller, J.M. *et al.* (2010) Vesicular stomatitis virus modified with single chain IL-23 exhibits oncolytic activity against tumor cells *in vitro* and *in vivo*. *Int. J. Inference Cytokine Mediator Res.* 2010: 63–72.
4. Juelke, K. *et al.* (2010) CD62L expression identifies a unique subset of polyfunctional CD56^{dim} NK cells. *Blood* 116 (8): 1299–1307.

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