

## GMP IL-12 Protein, Human (HEK293, His)

<b>Cat. No.:</b>	HY-P73156
<b>Synonyms:</b>	GMP IL-12; Interleukin 12; Interleukin-12 subunit alpha; IL-12A; Cytotoxic lymphocyte maturation factor 35 kDa subunit; CLMF p35; IL-12 subunit p35; Interleukin-12 subunit beta; IL-12B; Cytotoxic lymphocyte maturation factor 40 kDa subunit; CLMF p40; IL-12 subunit p40
<b>Species:</b>	Human
<b>Source:</b>	HEK293
<b>Accession:</b>	P29459 (R23-S219) & P29460 (I23-S328)
<b>Gene ID:</b>	3592&3593
<b>Molecular Weight:</b>	Approximately 60.2 (24+36.2) kDa

### PROPERTIES

<b>AA Sequence</b>	<p>M C P A R S L L L V    A T L V L L D H L S    L A R N L P V A T P    D P G M F P C L H H</p> <p>S Q N L L R A V S N    M L Q K A R Q T L E    F Y P C T S E E I D    H E D I T K D K T S</p> <p>T V E A C L P L E L    T K N E S C L N S R    E T S F I T N G S C    L A S R K T S F M M</p> <p>A L C L S S I Y E D    L K M Y Q V E F K T    M N A K L L M D P K    R Q I F L D Q N M L</p> <p>A v i D E L M Q A L    N F N S E T V P Q K    S S L E E P D F Y K    T K I K L C I L L H</p> <p>A F R I R A V T I D    R V M S Y L N A S</p>
<b>Biological Activity</b>	Measured by its ability to induce Interferon gamma secretion by human natural killer lymphoma NK-92 cells. The ED <sub>50</sub> for this effect is typically 0.04-0.4 ng/mL. The specific activity of recombinant human IL-12 is >10000 Units/μg, which is calibrated against the human IL-12 WHO International Standard
<b>Appearance</b>	Solution.
<b>Formulation</b>	Supplied as a 0.2 μm filtered solution of PBS, pH 7.4
<b>Endotoxin Level</b>	<1 EU/μg, determined by LAL method.
<b>Reconstitution</b>	N/A.
<b>Storage &amp; Stability</b>	Stored at -80°C for 1 year. It is stable at -20°C for 3 months after opening. It is recommended to freeze aliquots at -80°C for extended storage. Avoid repeated freeze-thaw cycles.
<b>Shipping</b>	Shipping with dry ice.

### DESCRIPTION

<b>Background</b>	Interleukin-12 subunit alpha (IL-12A; IL-12p35), an immune-suppressive cytokine, encodes a subunit of the cytokine IL-12 that acts on T and natural killer cells, and has a broad array of biological activities. IL-12A is a disulfide-linked heterodimer composed of the 35-kD subunit encoded by this gene, and a 40-kD subunit that is a member of the cytokine receptor family.
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IL-12 is primarily produced by professional antigen-presenting cells (APCs) such as B-cells and dendritic cells (DCs) as well as macrophages and granulocytes, induces the production of IFN-gamma, favors the differentiation of Th1 cells and is an important link between innate resistance and adaptive immunity<sup>[1][2]</sup>.

The amino acid sequence of human IL-12A protein has low homology between mouse IL-12A protein. While, human IL-12A shares 94% aa sequence identity with Rhesus Macaque IL-12A protein.

IL-12 family cytokines are pleiotropic immunological playmakers that coordinate innate and adaptive immune responses mainly via regulation of T-cell populations. The four core members of the Interleukin-12 (IL-12) family of cytokines, IL-12, IL-23, IL-27 and IL-35 are heterodimers which share  $\alpha$ -cytokine subunits (IL-12p35 (IL-12A), IL-23p19, and IL-27p28) and  $\beta$ -cytokine subunits (IL-12p40, Ebi3). The subunits are each encoded by separate chromosomes and their expression is regulated independently. Among them, the IL-12A subunit has immunoregulatory functions hitherto attributed to IL-35. Pairing of the  $\alpha$ -subunits, IL-12A or IL-23p19 with IL-12p40, gives rise to the two pro-inflammatory members IL-12 and IL-23, respectively, whereas the two immunosuppressive members of the family, IL-27 and IL-35, derive from pairing of IL-27p28 or IL-12A with Ebi3<sup>[1][2]</sup>.

IL-12A suppresses lymphocyte proliferation, induces expansion of IL-10-expressing and IL-35-expressing B cells and ameliorates autoimmune uveitis in mice by antagonizing pathogenic Th17 responses. IL-12A-mediated expansion of Treg and Breg cells and its amelioration of experimental autoimmune encephalomyelitis (EAE) correlated with inhibition of cytokine-induced activation of STAT1/STAT3 pathways. IL-12A may be utilized for in vivo expansion of Tregs and Bregs cells and autologous Tregs and Bregs cell immunotherapy<sup>[1][2]</sup>.

## REFERENCES

- [1]. Ivy M Dambuza, et al. IL-12p35 induces expansion of IL-10 and IL-35-expressing regulatory B cells and ameliorates autoimmune disease. *Nat Commun.* 2017 Sep 28;8(1):719.
- [2]. Jin Kyeong Choi, et al. IL-12p35 Inhibits Neuroinflammation and Ameliorates Autoimmune Encephalomyelitis. *Front Immunol.* 2017 Oct 5;8:1258.
- [3]. D De Wit, et al. Helper T-cell responses elicited by Der p 1-pulsed dendritic cells and recombinant IL-12 in atopic and healthy subjects. *J Allergy Clin Immunol.* 2000 Feb;105(2 Pt 1):346-52.

**Caution: Product has not been fully validated for medical applications. For research use only.**

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