GMP Recombinant Human IL-12 (p70) (carrier-free)

Catalog# / Size	573014 / 25 µg 573016 / 100 µg
Other Names	Natural killer cell stimulatory factor (NKSF), cytotoxic lymphocyte maturation factor (CLMF)
Description	IL-12 (p70) is a disulfide-linked heterodimer composed of unrelated p40 (glycosylated) and p35 subunits. IL-12 acts as a growth factor for activated human T and NK cells, enhances the lytic activity of human NK cells, and stimulates the production of IFNg by resting human PBMC. IL-12R is formed by two chains, IL-12Rβ1 and IL-12Rβ2. IL-12Rβ1 is associated with the Janus kinase (Jak) Tyk2 and binds IL-12 p40; IL-12Rβ2 is associated with Jak2 and binds either the heterodimer or the p35 chain. Signaling through the IL-12 receptor complex induces phosphorylation, dimerization, and nuclear translocation of several signal transducers and activators of transcription (STAT) family members (STAT1, 3, 4, 5), but most of the biological responses to IL-12 have been attributed to STAT4. IL-12 has been shown to elicit anti-tumor activity in mice and humans. It is believed that the antitumor effects of IL-12 are mediated, at least in part, by indirect mechanisms. Induction of IFN-γ results in the upregulation of class I and class II MHC molecules, adhesion molecules (ICAM-1), nitric oxide production by antigen presenting cells (APC), and the production of additional cytokines, CXCL9 and 10, which in turn mediate angiostatic effects. Cytokine detection IL-12, IL-23 and IL-35 share common subunits, utilizing combinations of p40, p19 and p35 proteins. Caution must be used when selecting antibodies and assays when specific identification, measurement, as well as activation state discrimination, is required.

Product Details

Source	Expressed in insect cells as secreted protein (p35: Accession# NM_000882, p40: Accession# NM_002187)
Molecular Mass	The hIL-12 consists of two subunits linked via a disulfide bond: P35 (Accession# NP_000873.2: Arg 57- Ser 253) and P40 (Accession# NP_002178.2: Ile 23-Ser 328). The total predicted molecular weight is 57 kDa. The non-reduced protein migrates at approximately 55 kDa and the DTT-reduced protein produces two bands migrating at approximately 26 kDa and 40 KDa by SDS-PAGE.
Purity	> 95%, as determined by Coomassie stained SDS-PAGE
Formulation	0.1 µm filtered protein solution is in PBS, pH 7.2.
Endotoxin Level	Less than 0.1 EU per µg protein as determined by the LAL method
Concentration	500 µg/mL
Storage & Handling	Unopened vial can be stored between 2°C and 8°C for up to 2 weeks, at -20°C for up to six months, or at -70°C or colder until the expiration date. For maximum results, quick spin vial prior to opening. The protein can be aliquoted and stored at -20°C or colder. Stock solutions can also be prepared at 50 - 100 µg/mL in appropriate sterile buffer, carrier protein such as 0.2 - 1% endotoxin-free BSA or HSA can be added when preparing the stock solution. Aliquots can be stored between 2°C and 8°C for up to one week or stored at -20°C or colder for up to 3 months. **Avoid repeated freeze/thaw cycles.**
Activity	ED_{50} = 0.01 - 0.1 ng/mL as determined by the dose-dependent production of IFN-γ in PHA activated human PBMC.
Application	Bioassay Cell culture
Application Notes	BioLegend carrier-free recombinant proteins provided in liquid format are shipped on blue ice. Our comparison testing data indicates that when handled and stored as recommended, the liquid format has equal stability and shelf-life compared to commercially available lyophilized proteins after reconstitution. Our liquid proteins are validated in-house to maintain activity after shipping on blue ice and are backed by our 100% satisfaction guarantee. If you have any concerns, contact us at tech@biolegend.com.
Disclaimer	**GMP Recombinant Proteins.** BioLegend GMP recombinant proteins are manufactured in a dedicated GMP facility and compliant with ISO 13485:2016. For research or ex vivo cell processing use. Not for use in diagnostic or therapeutic procedures. Our processes include:

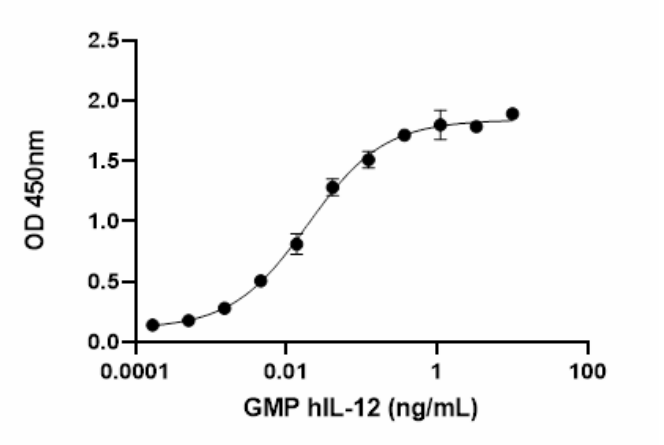
- Batch-to-batch consistency
- Material traceability
- Documented procedures
- Documented employee training
- Equipment maintenance and monitoring records
- Lot-specific certificates of analysis
- Quality audits per ISO 13485:2016
- QA review of releaed products

BioLegend GMP recombinant protiens are manufactured and tested in accordance with USP Chapter 1043, Ancillary Materials for Cell, Gene and Tissue-Engineered Products and Ph. Eur. Chapter 5.2.12.

Antigen Details

Structure	Cytokine
Distribution	IL-12 is produced by monocytes, macrophages, neutrophils, dendritic cells and B cells. In the CNS, astrocytes and microglia are the main sources of IL-12.
Function	IL-12 is produced by myeloid cells and DCs in response to microbial stimuli, such as those mediated by bacteria, fungi, viruses, and intracellular parasites. IL-12 drives Th1 differentiation and IFNγ production. IL-12 acts as a bridge between innate resistance and adaptive immunity. IL-12 production by activated APC is suppressed by IL-10. In addition, IL-12 production by macrophages is regulated by TNFα and nitric oxide. TLR-4 and TLR-9 can cooperate to increase selectively IL-12 production by murine dendritic cells.
Interaction	Cells of hematopoietic origin express the IL-12R, including NK cells, activated T-cells and dendritic cells.
Ligand/Receptor	IL-12 receptor is a heterodimer containing IL-12Rβ1 and IL-12Rβ2 subunits.
Bioactivity	Measured by its ability to induce IFN-γ production in PHA activated human PBMC
Biology Area	Immunology, Innate Immunity
Molecular Family	Cytokines/Chemokines
Antigen References	1. Schoenhaut DS, *et al*. 1992. *J Immunol*. 148:3433-40. 2. Manetti R, *et al*. 1994. *J Exp Med*. 179:1273-83. 3. Ireland D, *et al*. 2005. *Viral Immunol*. 18:397-402. 4. Moreno SE, *et al*. 2006. *J Immunol*. 177:3218-24. 5. Lyakh L, *et al*. 2008. *Immunol Rev*. 226:112-31. 6. Theiner G, *et al*. 2008. *Mol Immunol*. 45:244-52. 7. Zhu S, *et al*. 2010. *J Immunol*. 184:2348-54.
Gene ID	3592 3593

Product Data



GMP recombinant human IL-12 induces IFN-γ production in PHA activated human PBMC in a dose-dependent manner with ED_{50} range of 0.01 - 0.1 ng/mL.

Symbols Glossary*

Symbol	Meaning	Symbol Title	Symbol No.	Symbol	Meaning	Symbol Title	Symbol No.
REF	Catalog number	Catalogue number	5.1.6		Indicates the need for the user to consult the instructions for use.	Consult instructions for use	5.4.3
	Indicates the temperature limits to which the medical device can be safely exposed.	Temperature limit	5.3.7		Indicates a medical device that needs protection from light sources.	Keep away from sunlight	5.3.2
	Indicates the upper limit of temperature to which the medical device can be safely exposed.	Upper limit of temperature	5.3.6		Indicates the date after which the medical device is not to be used.	Use-by date	5.1.4
	Indicates the medical device manufacturer.	Manufacturer	5.1.1	EC REP	Indicates the authorized representative in the European Community.	Authorized representative in the European Community	5.1.2
LOT	Indicates the manufacturer's batch code so that the batch or lot can be identified.	Batch code	5.1.5	IVD	Indicates a medical device that is intended to be used as an in vitro diagnostic medical device.	*In vitro* diagnostic medical device	5.5.1

* Symbol information is from EN ISO 15223-1:2016 Medical devices – Symbols to be used with medical device labels, labelling and information to be supplied – Part 1: General requirements

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