GMP Recombinant Human TNF-α (carrier-free)

Catalog# / Size	570114 / 25 µg 570116 / 100 µg
Other Names	Tumor necrosis factor-α, Cachectin, Necrosin, Macrophage cytotoxic factor (MCF), Differentiation inducing factor (DIF), TNFSF2
Description	TNF-α was originally described as an endotoxin-induced, macrophage-derived factor that promotes hemorrhagic necrosis of solid tumors and the cachexia of chronic infections. TNF-α has also been implicated in a range of inflammatory, infectious, and malignant disorders. At the cellular level, TNF-α modulates a broad spectrum of responses including inflammation, immunoregulation, proliferation, apoptosis, and antiviral activity. In bone, the cytokine inhibits extracellular matrix deposition, stimulates matrix metalloprotease synthesis, and enhances production of osteoclastogenic cytokines such as M-CSF and RANKL. Chronic exposure to TNF-α in vivo increases osteoclastogenesis through two distinct mechanisms. TNF-α first affects osteoclastogenesis at the osteoclast precursor stage in the bone marrow by priming these cells to differentiate into cFms+/CD11b+/RANK+/- osteoclast progenitors via a RANKL/RANK independent mechanism. These osteoclast precursors then enter the blood and peripheral tissues where they differentiate into mature osteoclasts in the presence of RANKL, and this process is accelerated by TNF. The role of TNF at this later stage of osteoclast differentiation is RANKL/RANK dependent. Importantly, TNF-α promotes bone resorption both in vitro and in vivo by enhancing the proliferation and differentiation of osteoclast precursors.

Product Details

Source	Human TNF-α, amino acids Val77-Leu233 (Accession# NM_000594), was expressed in E. coli.
Molecular Mass	The 157 amino acid recombinant protein has a predicted molecular mass of 17.35 kD. The DTT-reduced protein and non-reduced protein migrate at approximately 16 kD by SDS-PAGE. The N-terminal amino acid is Val.
Purity	> 95%, as determined by Coomassie stained SDS-PAGE
Formulation	0.1 µm filtered protein solution is in 10 mM NaH_2PO_4, 150 mM NaCl, 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 - 0.085 ng/mL as determined by the dose-dependent cytotoxicity of L929 cells stimulated with actinomycin D.
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 verified 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:

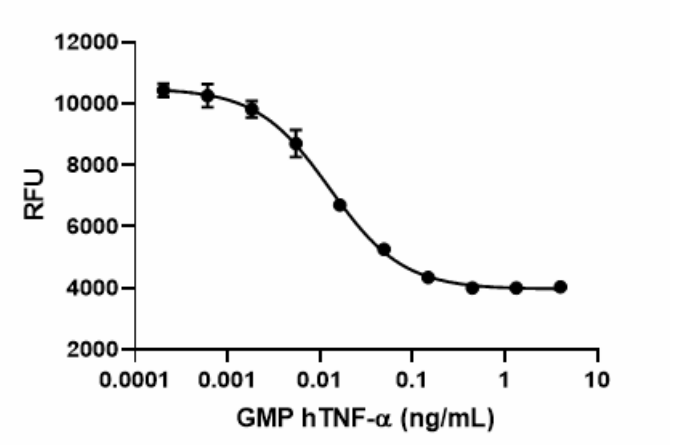
- Batch-to-batch consistency
- Material traceability
- Documented procedures
- Documented employee training
- Equipment maintenance and monitoring records
- Lot-specific certificates of analysis
- Quality audits per ISO 13485:2016
- QA review of releaed products

BioLegend GMP recombinant proteins 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	TNF superfamily
Distribution	It is produced primarily by macrophages, and it is also expressed by activated T cells, B cells, NK cells, and neutrophils.
Function	Type II integral membrane protein processed by TACE for secretion; upregulated by interferons, IL-2, GM-CSF, substance P, bradykinin, PAF, immune complexes, cyclooxygenase; downregulated by IL-6, TGF-β, vitamin D3, prostaglandin E2, PAF antagonists
Interaction	Monocytes, neutrophils, macrophages, T cells, fibroblasts, endothelial cells, osteoclasts, adipocytes, astroglia, microglia
Ligand/Receptor	TNFRSF1A (TNF-R1, CD120a, TNFR-p60 Type β, p55); TNFRSF1B (TNF-R2, CD120b, TNFR-p80 Type A, p75)
Bioactivity	Measured by its ability to induce cytotoxicity of L929 cells stimulated with actinomycin D
Biology Area	Cell Biology, Immunology, Innate Immunity, Neuroinflammation, Neuroscience
Molecular Family	Cytokines/Chemokines
Antigen References	1. Boyce BF, et al. 2005. J Med 54:127-131. 2. Lam J, et al. 2000. J Clin Invest 106:1481-1488. 3. Udagawa N, et al. 2002. Arthritis Res 4:281-289. 4. Kwon J, et al. 1993. Gene 132:227-236. 5. Harth S, et al. 2019. MAbs. 11:178. 6. de Oliveira Mann CC, et al. 2019. Cell Rep. 27:1165. 7. Anderson NR, et al. 2019. Cell Adh Migr. 13:163. 8. Zhichao Fan, et al. 2019. Cell Rep. 26(1):119-130. 9. VanDussen KL, et al. 2019. Stem Cell Res. 37:101430. 10. Hurrell BP, et al. 2019. Cell Rep. 29:4509.
Gene ID	7124

Product Data



GMP recombinant human TNF-α induces cytotoxicity of L929 cells in a dose-dependent manner with an ED_{50} range of 0.01 - 0.085 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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