Human TNF-α
premium grade

10 µg 130-094-014

Contents

1. Description

Components	**Human TNF-α, premium grade:** Purified recombinant human tumor necrosis factor α.
Size	10 µg.
Biological activity	The ED_{50} is <0.025 ng/mL* corresponding to a specific activity of $>4\times10^7$ I.U./mg.
Primary structure	Single, non-glycosylated polypeptide chain (157 amino acid residues).
Molecular mass	17.4 kDa.
Source	Produced in *E. coli*.
Product format	Lyophilized from a 0.2 µm filtered solution.
Stabilizer	Trehalose and mannitol.
Purity	>97% as determined by chip-based gel electrophoresis.
Endotoxin level	Low endotoxin (<1 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.
Storage	Lyophilized Human TNF-α, 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. Avoid repeated freeze-thaw cycles.
Reconstitution	It is recommended to reconstitute lyophilized Human TNF-α with deionized sterile-filtered water up to a final concentration of 10 µg/mL. ▲ **Note:** Addition of carrier protein, such as 0.1% bovine serum albumin (BSA) or human serum albumin (HSA) may have stabilizing effects. Further dilutions should be prepared with 1% BSA or HSA in phosphate-buffered saline (PBS).

* The ED_{50} is determined by cytotoxicity assay using L929 cells in the presence of 1 µg/mL actinomycin D according to Baarsch *et al.*[1]. The cytotoxicity assay was calibrated with the first international reference standard for human TNF-α (NIBSC code 88/786) provided by the WHO/National Institute for Biological Standards and Control.

1.1 Background information

Tumor necrosis factor α (TNF-α), also called TNF ligand superfamily member 2 (TNFSF2), is a pro-inflammatory cytokine that is mainly produced by activated monocytes and macrophages in response to infection, injury, and tumor burden. TNF-α production has also been reported for a variety of other cell types involved in inflammatory responses, including T cells, NK cells, and neutrophils as well as a number of non-immune cells, such as keratinocytes and astrocytes. TNF-α has a broad spectrum of biological activities. In addition to its central role in inflammation, TNF-α is noted for its cytotoxic and tumoricidal abilities either by necrosis or apoptosis induction. Further functions include anti-viral activity, growth modulation, and induction of cellular differentiation.[2] Despite its various beneficial actions, TNF-α also plays a detrimental role in septic shock syndrome, tissue injury, inflammation, cachexia, diabetes, etc.[3]

TNF-α exists also as a membrane-associated 26 kDa precursor from which the mature soluble 17 kDa form is released by proteolytic cleavage mediated by TNF-α converting enzyme. TNF-α exerts many of its effects by binding to two distinct cell surface receptors, the 55 kDa TNF receptor 1 or the 75 kDa cell TNF receptor 2.[4]

1.2 Applications

- TNF-α can be used for a variety of applications, including induction of Mo-DC maturation, cytotoxicity and cell proliferation assays, assessment of apoptosis and viral protection, and investigation of TNF-α–induced signaling pathways.

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

2. References

1. Baarsch, M. J. *et al.* (1991) Detection of tumor necrosis factor alpha from porcine alveolar macrophages using an L929 fibroblast bioassay. J. Immunol. Methods 140: 15–22.
2. Barbara, J. A. *et al.* (1996) Tumour necrosis factor-alpha (TNF-alpha): the good, the bad and potentially very effective. Immunol. Cell. Biol. 74: 434–443.
3. Yeung, M. C. *et al.* (1996) An essential role for the interferon-inducible, double-stranded RNA-activated protein kinase PKR in the tumor necrosis factor-induced apoptosis in U937 cells. Proc. Natl. Acad. Sci. U S A. 93: 12451–12455.
4. Black, R. A. *et al.* (1997) A metalloproteinase disintegrin that releases tumour-necrosis factor-alpha from cells. Nature 385: 729–733

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