

# Human TNF- $\alpha$ premium grade

10  $\mu\text{g}$   
50  $\mu\text{g}$   
100  $\mu\text{g}$   
1000  $\mu\text{g}$

130-094-022  
130-094-023  
130-094-024  
130-094-562

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## 1. Description

<b>Components</b>	<b>Human TNF-<math>\alpha</math>, premium grade:</b> Purified recombinant human tumor necrosis factor $\alpha$ .
<b>Sizes</b>	10 $\mu\text{g}$ , 50 $\mu\text{g}$ , 100 $\mu\text{g}$ , 1000 $\mu\text{g}$ .
<b>Biological activity</b>	The ED <sub>50</sub> is $\leq 0.025$ ng/mL* corresponding to a specific activity of $\geq 4 \times 10^7$ I.U./mg.
<b>Primary structure</b>	Single, glycosylated polypeptide chain (157 amino acid residues).
<b>Molecular mass</b>	17 kDa.
<b>Source</b>	Produced in yeast.
<b>Product format</b>	Lyophilized from a 0.2 $\mu\text{m}$ filtered buffer solution.
<b>Stabilizer</b>	Mannitol.
<b>Purity</b>	>97% as determined by SDS-PAGE analysis.
<b>Endotoxin level</b>	Low endotoxin (<1.0 EU/ $\mu\text{g}$ cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.
<b>Storage</b>	Lyophilized Human TNF- $\alpha$ , 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.
<b>Reconstitution</b>	It is recommended to reconstitute lyophilized Human TNF- $\alpha$ with deionized sterile-filtered water to a final concentration of not less than 100 $\mu\text{g}/\text{mL}$ . <b>▲ Note:</b> 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<sub>50</sub> is determined by cytotoxicity assay using L929 cells in the presence of 1  $\mu\text{g}/\text{mL}$  actinomycin D according to Baarsch *et al.*<sup>1</sup>. The cytotoxicity assay was calibrated with the first international reference standard for human TNF- $\alpha$  (NIBSC code 88/786) provided by the WHO/National Institute for Biological Standards and Control.

### 1.1 Background information

Tumor necrosis factor  $\alpha$  (TNF- $\alpha$ ), 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- $\alpha$  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- $\alpha$  has a broad spectrum of biological activities. In addition to its central role in inflammation, TNF- $\alpha$  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.<sup>2</sup> Despite its various beneficial actions, TNF- $\alpha$  also plays a detrimental role in septic shock syndrome, tissue injury, inflammation, cachexia, diabetes, etc.<sup>3</sup>

TNF- $\alpha$  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- $\alpha$  converting enzyme. TNF- $\alpha$  exerts many of its effects by binding to two distinct cell surface receptors, the 55 kDa TNF receptor 1 or the 75 kDa TNF receptor 2.<sup>4</sup>

### 1.2 Applications

- TNF- $\alpha$  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- $\alpha$ -induced signaling pathways.

Optimal 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. USA* 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.

All protocols and data sheets are available at [www.miltenyibiotec.com](http://www.miltenyibiotec.com).

### **Warranty**

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