

## TNF alpha protein, Human (His)

<b>Cat. No.:</b>	HY-P70426A
<b>Synonyms:</b>	Tumor Necrosis Factor; Cachectin; TNF-Alpha; Tumor Necrosis Factor Ligand Superfamily Member 2; TNF-a; TNF; TNFA; TNFSF2
<b>Species:</b>	Human
<b>Source:</b>	E. coli
<b>Accession:</b>	P01375 (V77-L233)
<b>Gene ID:</b>	7124
<b>Molecular Weight:</b>	Approximately 18 kDa

### PROPERTIES

<b>AA Sequence</b>	<pre> V R S S S R T P S D   K P V A H V V A N P   Q A E G Q L Q W L N   R R A N A L L A N G V E L R D N Q L V V   P S E G L Y L I Y S   Q V L F K G Q G C P   S T H V L L T H T I S R I A V S Y Q T K   V N L L S A I K S P   C Q R E T P E G A E   A K P W Y E P I Y L G G V F Q L E K G D   R L S A E I N R P D   Y L D F A E S G Q V   Y F G I I A L           </pre>
<b>Biological Activity</b>	Measured in a cytotoxicity assay using L-929 mouse fibroblast cells in the presence of the metabolic inhibitor actinomycin D. The ED <sub>50</sub> for this effect is < 0.13 ng/mL.
<b>Appearance</b>	Lyophilized powder
<b>Formulation</b>	Lyophilized from a 0.2 µm filtered solution of PBS, 300 mM NaCl, pH 7.4 or PBS, pH 7.4.
<b>Endotoxin Level</b>	<1 EU/µg, determined by LAL method.
<b>Reconstitution</b>	It is not recommended to reconstitute to a concentration less than 100 µg/mL in ddH <sub>2</sub> O. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
<b>Storage &amp; Stability</b>	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
<b>Shipping</b>	Room temperature in continental US; may vary elsewhere.

### DESCRIPTION

<b>Background</b>	<p>TNF alpha is produced by various types of cells including macrophages, monocytes, neutrophils, T cells, and NK-cells<sup>[2]</sup>. The amino acid sequence of human TNF alpha protein has low homology between mouse, rat, bovine, cynomolgus TNF alpha protein. While, human TNF alpha shares 94.85% aa sequence identity with cynomolgus TNF alpha protein, mouse TNF alpha shares 94.47% aa sequence identity with rat TNF alpha protein.</p> <p>TNF alpha exists in two forms; a type II transmembrane protein (tmTNF-α) and a mature soluble protein (sTNF-α). TNF-α</p>
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binds to its receptors, mainly TNFR1 and TNFR2, and then transmits molecular signals for biological functions such as inflammation and cell death. Both sTNF- $\alpha$  and tmTNF- $\alpha$  activate TNFR1, and process a death domain (DD) that interacts with the TNFR1-associated death domain (TRADD) adaptor protein. The TNFR2 signaling pathway is mainly activated by tmTNF- $\alpha$ . TNFR1 signaling tends to be pro-inflammatory and apoptotic. TNFR2 results in NF- $\kappa$ B and MAPKs and AKT activation, TNFR2 activation is associated with homeostatic bioactivities such as tissue regeneration, cell proliferation, and cell survival, as well as host defense and inflammation<sup>[1]</sup>.

TNF-alpha is critical for normal immune response, abnormal secretion TNF alpha activates synovial fibroblasts, keratinocytes, osteoclasts, induces rheumatoid arthritis, inflammatory bowel disease, psoriatic arthritis (PsA), and noninfectious uveitis (NIU)<sup>[3]</sup>. TNF alpha positively regulates endogenous TNF- $\alpha$  expression levels independently of Pgp efflux activity, induces IHF cells proliferation<sup>[4]</sup>. TNF alpha in tissues may promote cancer growth, invasion, and metastasis. Besides, TNF alpha stimulates NF- $\kappa$ B pathway via TNFR2 and anti-TNF- $\alpha$  MAb significantly suppresses the tumor development in colitis-associated cancer (CAC) mouse<sup>[5]</sup>. TNF alpha as a proneurogenic factor activates the SAPK/JNK pathway and can facilitate neuronal replacement and brain repair in response to brain injury<sup>[6]</sup>.

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## REFERENCES

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- [6]. Bernardino L, et al. Tumor necrosis factor-alpha modulates survival, proliferation, and neuronal differentiation in neonatal subventricular zone cell cultures. *Stem Cells*. 2008 Sep;26(9):2361-71.
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**Caution: Product has not been fully validated for medical applications. For research use only.**

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