

## TNF-alpha/TNFSF2 Protein, Mouse (156a.a, His)

Cat. No.:	HY-P7090B
Synonyms:	rMuTNF- $\alpha$ /TNFSF2; TNF-alpha; Cachectin; DIF; TNFA; Differentiation-inducing factor
Species:	Mouse
Source:	E. coli
Accession:	P06804 (L80-L235)
Gene ID:	21926
Molecular Weight:	Approximately 19 kDa

### PROPERTIES

AA Sequence	L R S S S Q N S S D    K P V A H V V A N H    Q V E E Q L E W L S    Q R A N A L L A N G M D L K D N Q L V V    P A D G L Y L V Y S    Q V L F K G Q G C P    D Y V L L T H T V S R F A I S Y Q E K V    N L L S A V K S P C    P K D T P E G A E L    K P W Y E P I Y L G G V F Q L E K G D Q    L S A E V N L P K Y    L D F A E S G Q V Y    F G V I A L
Biological Activity	Measured by its binding ability 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 53.92 $\mu$ g/mL.
Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 $\mu$ m filtered solution of 50 mM Tris-HCl, 300 mM NaCl, pH 7.4, 5% trehalose, 5% mannitol and 0.01% Tween 80.
Endotoxin Level	<1 EU/ $\mu$ g, determined by LAL method.
Reconstitution	It is not recommended to reconstitute to a concentration less than 100 $\mu$ g/mL in ddH <sub>2</sub> O.
Storage & Stability	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.
Shipping	Room temperature in continental US; may vary elsewhere.

### DESCRIPTION

Background	<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-<math>\alpha</math>) and a mature soluble protein (sTNF-<math>\alpha</math>). TNF-<math>\alpha</math></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>.

## REFERENCES

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- [3]. Jang DI, et al. The Role of Tumor Necrosis Factor Alpha (TNF- $\alpha$ ) in Autoimmune Disease and Current TNF- $\alpha$  Inhibitors in Therapeutics. *Int J Mol Sci*. 2021 Mar 8;22(5):2719.
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- [7]. Matsuno H, et al. The role of TNF- $\alpha$  in the pathogenesis of inflammation and joint destruction in rheumatoid arthritis (RA): a study using a human RA/SCID mouse chimera. *Rheumatology (Oxford)*. 2002 Mar;41(3):329-37.

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