

## TNF-alpha/TNFSF2 Protein, Canine

Cat. No.:	HY-P73443
Synonyms:	Tumor Necrosis Factor; Cachectin; TNF-Alpha; Tnf; Tnfa; Tnfsf2; ICD1
Species:	Canine
Source:	E. coli
Accession:	P51742/NP_001003244.4 (V77-L233)
Gene ID:	403922
Molecular Weight:	Approximately 17 kDa

### PROPERTIES

Biological Activity	Measured in a cytotoxicity assay using L-929 mouse fibrosarcoma cells in the presence of the metabolic inhibitor actinomycin D and the ED <sub>50</sub> is typically 0.01-0.08 ng/mL.
Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 µm filtered solution of 50 mM Tris, 500 mM NaCl, 20% Glycerol, pH 8.0. Normally 5 % - 8 % trehalose, mannitol and 0.01% Tween 80 are added as protectants before lyophilization.
Endotoxin Level	<1 EU/µg, determined by LAL method.
Reconstitution	It is not recommended to reconstitute to a concentration less than 100 µg/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

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.

TNF alpha exists in two forms; a type II transmembrane protein (tmTNF-α) and a mature soluble protein (sTNF-α). TNF-α binds to its receptors, mainly TNFR1 and TNFR2, and then transmits molecular signals for biological functions such as inflammation and cell death. Both sTNF-α and tmTNF-α 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-α. TNFR1 signaling tends to be pro-inflammatory and apoptotic. TNFR2 results in NF-κB 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,

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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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- [1]. Horiuchi T, et al. Transmembrane TNF-alpha: structure, function and interaction with anti-TNF agents. *Rheumatology (Oxford)*. 2010 Jul;49(7):1215-28.
- [2]. El-Tahan RR, et al. TNF- $\alpha$  gene polymorphisms and expression. *Springerplus*. 2016 Sep 7;5(1):1508.
- [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.
- [4]. Berguetti T, et al. TNF- $\alpha$  Modulates P-Glycoprotein Expression and Contributes to Cellular Proliferation via Extracellular Vesicles. *Cells*. 2019 May 24;8(5):500.
- [5]. Onizawa M, et al. Signaling pathway via TNF-alpha/NF-kappaB in intestinal epithelial cells may be directly involved in colitis-associated carcinogenesis. *Am J Physiol Gastrointest Liver Physiol*. 2009 Apr;296(4):G850-9.
- [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.
- [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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**Caution: Product has not been fully validated for medical applications. For research use only.**

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