

Product Specification Sheet

Human TNF-alpha, Tumor necrosis factor ligand superfamily member 2, TNF-a, Cachectin, DIF, TNFA, TNFSF2

Cat # TNFA15-R 10

Recombinant purified human TNF-alpha, biologically active

SIZE: 10 ug

Tumor necrosis factor (TNF, cachexin or cachectin and formally known as tumor necrosis factor-alpha) is a cytokine involved in systemic inflammation and is a member of a group of cytokines that stimulate the acute phase reaction. The primary role of TNF is in the regulation of immune cells. TNF is also able to induce apoptotic cell death, to induce inflammation, and to inhibit tumorigenesis and viral replication. Dysregulation and, in particular, overproduction of TNF have been implicated in a variety of human diseases, as well as cancer.

TNF is primarily produced as a 212-amino acid-long type II transmembrane protein arranged in stable homotrimers (protein accession #P012375). From this membrane-integrated form the soluble homotrimeric cytokine (sTNF) is released via proteolytic cleavage by the metalloprotease TNF alpha converting enzyme (TACE, also called ADAM17). The soluble 51 kDa trimeric sTNF tends to dissociate at concentrations below the nanomolar range, thereby losing its bioactivity.

The 17-kilodalton (kDa) TNF protomers (185-amino acid-long) are composed of two antiparallel β -pleated sheets with antiparallel β -strands, forming a 'jelly roll' β -structure, typical for the TNF family, but also found in viral capsid proteins. TNF is produced mainly by macrophages, but they are produced also by a broad variety of other cell types including lymphoid cells, mast cells, endothelial cells, cardiac myocytes, adipose tissue, fibroblasts, and neuronal tissue. Large amounts of TNF are released in response to lipopolysaccharide, other bacterial products, and Interleukin-1 (IL-1).

•FUNCTION: Cytokine that binds to TNFRSF1A/TNFR1 and TNFRSF1B/TNFR2. It is mainly secreted by macrophages and can induce cell death of certain tumor cell lines. It is potent pyrogen causing fever by direct action or by stimulation of interleukin-1 secretion and is implicated in the induction of cachexia. Under certain conditions it can stimulate cell proliferation and induce cell differentiation.

•SUBUNIT: Homotrimer.

•INTERACTION:

P19438:TNFRSF1A; NbExp=1; IntAct=EBI-359977, EBI-299451;

•SUBCELLULAR LOCATION: Cell membrane; Single-pass type II membrane protein.

•SUBCELLULAR LOCATION: Tumor necrosis factor, soluble form: Secreted.

•PTM: The soluble form derives from the membrane form by proteolytic processing.

•PTM: The membrane form, but not the soluble form, is phosphorylated on serine residues. Dephosphorylation of the membrane form occurs by binding to soluble TNFRSF1A/TNFR1.

•PTM: O-glycosylated; glycans contain galactose, N-acetylgalactosamine and N-acetylneuraminic acid.

•DISEASE: Cachexia accompanies a variety of diseases, including cancer and infection, and is characterized by general ill health and malnutrition.

•DISEASE: Genetic variations in TNF are associated with susceptibility to psoriatic arthritis [MIM:607507]. Psoriasis is a chronic inflammatory dermatosis that affects approximately 2% of the population. It is characterized by red, scaly skin lesions that are usually found on the scalp, elbows, and knees, and may be

associated with severe arthritis. Psoriatic arthritis has been defined as an inflammatory arthritis usually without any rheumatoid factor in serum (seronegative arthritis) associated with psoriasis.

•DISEASE: Genetic variations in TNF are associated with susceptibility to hepatitis B virus infection (HBV infection) [MIM:610424]. Approximately one third of all cases of cirrhosis and half of all cases of hepatocellular carcinoma can be attributed to chronic HBV infection. HBV infection may result in subclinical or asymptomatic infection, acute self-limited hepatitis, or fulminant hepatitis requiring liver transplantation.

Recombinant TNF is used as an immunostimulant under the INN tasonermin.

Form, Storage, and Reconstitution

Tumor Necrosis Factor-alpha Human Recombinant produced in E. Coli is a single, non-glycosylated, polypeptide chain containing 158 amino acids and having a molecular mass of 17.48 Kda (purity >98%). The TNF-alpha is purified by standard chromatographic techniques. The sequence of the first five N-terminal amino acids was determined and was found to be Met-Val-Arg-Ser-Ser

TNF-alpha purified is supplied in 20mM PBS, pH-7.2, and 10mM NaCl in liquid or lyophilized in the same buffer (see lot sp. concn on the vial).

Storage and Stability

Reconstitute the lyophilized Tumor Necrosis Factor-alpha in water at not less than 100 μ g/ml, which can then be further diluted to other aqueous solutions. For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA).

Lyophilized Tumor Necrosis Factor-alpha although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution TNF-alpha should be stored at 4°C between 2-7 days and for future use below -18°C

Biological activity

The ED50 as determined by the cytolysis of murine L929 cells in the presence of Actinomycin D is < 0.05ng/ml, corresponding to a Specific Activity of 2 x 10⁷ IU/mg.

General References: Pennica D (1984) Nature 312, 724-729; Shirai T (1985) Nature 313, 803-806; Nedwin GE (1985) Nucl. Acid. Res. 13, 6361-6373; Jones EY (1990) J. Cell Sci. (1990) 13, 11-18;

*This product is for In vitro research use only.

TNFA15-R-10-100-1000

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