

TNF alpha human

Tumor Necrosis Factor-Alpha Human Recombinant

CYK0558

Product Overview

Name	TNF alpha human
Accession(Primary)	P01375
Description	Tumor Necrosis Factor-Alpha Human Recombinant

Target information (P01375)

Gene Name

About Gene Symbol

Background

TNF Alpha Human: An Overview of Its Role and Importance in Immunology TNF alpha human, also known as Tumor Necrosis Factor-alpha, is a critical cytokine in the immune system. Macrophages mainly produce this protein, and it plays a key role in inflammation and the acute phase reaction. This protein is involved in various cellular functions, including cell death, differentiation, proliferation, and immune regulation.

Production and Properties Tumor Necrosis Factor-alpha is produced recombinantly in *E. coli* and consists of a single, non-glycosylated polypeptide chain. It includes 157 amino acids of the mature human TNF-alpha and an N-terminal methionine, resulting in a molecular mass of approximately 17.5 kDa. Furthermore, the protein is purified through standard chromatographic techniques to ensure high purity and biological activity.

Solubility and Usage The lyophilized form of TNF appears as a sterile, white powder. It is recommended to reconstitute this powder in sterile water to achieve a solution of no less than 100 µg/ml. This solution can then be further diluted for various experimental applications. TNF alpha is used extensively in research, particularly for studying its effects on cell signaling and immune response.

Storage and Stability For long-term storage, TNF should be kept desiccated below -18°C. Once reconstituted, it should be used within a week if stored at 4°C or kept below -18°C for future use.

Avoiding freeze-thaw cycles is crucial to maintain the protein's functionality. Biological Role and Implications TNF alpha human is involved in the regulation of immune cells and is known for its role in inflammatory processes. Dysregulation of TNF alpha production is linked to various diseases, such as autoimmune disorders, insulin resistance, and cancer. It is also a target for therapeutic interventions, particularly in conditions like rheumatoid arthritis and inflammatory bowel disease. Mechanism of Action TNF alpha can induce fever, apoptotic cell death, and can inhibit tumorigenesis and viral replication. Moreover, it is a potent mediator of the acute phase reaction, which influences the activity of various cells involved in systemic inflammation. Research and Clinical Importance Scientific research on TNF has provided insights into its complex role in disease mechanisms. Its interaction with receptors such as TNFRSF1A underscores its multifaceted effects across different organ systems, from liver function to brain activity. Ongoing studies continue to explore its therapeutic potential, especially how it can be modulated to treat diseases without harmful side effects. In essence, TNF alpha human is a versatile and powerful component of the immune system, important for both health and disease. Understanding its pathways and functions helps scientists develop better treatments for various inflammatory and autoimmune diseases.