9051 Mira Mesa Blvd, #910094
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TGFB1 Human

Transforming Growth Factor-beta 1 Human
GRF0387

Product Overview

Name	TGFB1 Human
Description	
Transforming Growth Factor-beta 1 Human	
Accession (Primary)	P01137
Synonyms	
Transforming growth factor beta-1, TGF-beta-1, CED, DPD1, TGFB, TGF-b 1.	
Introduction	
Transforming growth factor betas (TGF Betas) mediate many cell-cell interactions that occur during embryonic development. Three TGFBetas have been identified in mammals. TGFBeta1, TGFBeta2 and TGFBeta3 are each synthesized as precursor proteins that are very similar in that each is cleaved to yield a 112 amino acid polypeptide that remains associated with the latent portion of the molecule.	
Source	
Human Platelets.	
Physical Appearance	
Sterile Filtered lyophilized powder.	
Formulation	
TGF-Beta1 protein was lyophilized from a solution containing 30% acetonitrile and 0.1% trifluoroacetic acid.	
Stability	
Lyophilized TGF-beta 1 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution TGF-beta 1 should be stored at 4°C between 2-7 days and for future use below -18°C. DO NOT RECONSTITE WITH NEUTRAL BUFFERS. DO NOT USE GLASS IMPLEMENTS OR EXTENSIVE MANIPULATIONS. PREVENT FREEZE THAW CYCLES.	
Purity	
Greater than 98.0% as determined by SDS-PAGE.	
Biological Activity	
Stimulates the growth of NRK-1 cells in soft agar at concentrations ranging from 0.1 to 5ng/ml corresponding to a specific activity of 200,000-10,000,000IU/mg. Effective concentration ranges must be experimentally determined. Purified EGF and/or TGF- must be present for observation of the biological activity.	

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Solubility

It is recommended to reconstitute lyophilized TGF-beta 1 in 0.5% BSA in 0.1N acetic acid, which can then be further diluted to the desired aliquot with 30% acetonitrile and 0.1% trifluoroacetic acid.

Background

Title: Transforming Growth Factor-Beta 1 Human: An Insight into its Role in Cellular Regulation Abstract: Transforming Growth Factor-Beta 1 (TGF-β1) is a multifunctional cytokine that plays a critical role in various cellular processes, including cell growth, differentiation, apoptosis, and immune regulation. This research paper aims to provide a comprehensive overview of the structure, synthesis, signaling pathways, and biological functions of TGF-β1 in human cells. Additionally, this article highlights the relevance of TGF-β1 in various physiological and pathological conditions, including cancer, fibrosis, and immune disorders. Furthermore, potential therapeutic strategies targeting TGF-β1 signaling are also discussed. The information presented in this paper consolidates the current understanding of TGF-β1 and its significance in cellular regulation. Introduction: Transforming Growth Factor-Beta 1 (TGF-β1) belongs to a superfamily of growth factors that regulate various cellular processes. It is synthesized as a precursor protein and undergoes proteolytic cleavage to generate the biologically active form. TGF-β1 exerts its effects by binding to specific cell surface receptors, leading to the activation of downstream signaling cascades. These signaling pathways involve Smad-dependent and Smad-independent mechanisms, which ultimately regulate gene expression and cellular responses. Biological Functions: TGF-β1 regulates cell proliferation by exerting both stimulatory and inhibitory effects, depending on the cellular context. It plays a crucial role in tissue development, wound healing, and tissue repair by promoting extracellular matrix synthesis and modulating the immune response. TGF-β1 also has immunomodulatory functions, influencing the differentiation and function of immune cells. However, dysregulation of TGF-β1 signaling is associated with various pathologies, including cancer progression, fibrosis, and autoimmune disorders. Role in Cancer: TGF-β1 acts as a tumor suppressor in early stages of cancer by inhibiting cell proliferation and inducing apoptosis. However, in advanced stages, it promotes tumor progression by enhancing tumor cell migration, invasion, and angiogenesis. The dual role of TGF-β1 in cancer highlights its complex involvement in tumorigenesis. Therapeutic Implications: Given the significant role of TGF-β1 in various diseases, targeting its signaling pathways has emerged as a potential therapeutic strategy. Several approaches, including small molecule inhibitors, antibodies, and gene therapies, are being explored to modulate TGF-β1 activity in a controlled manner. These interventions hold promise in the treatment of cancer, fibrosis, and other TGF-β1-related disorders. Conclusion: Transforming Growth Factor-Beta 1 is a versatile cytokine with diverse functions in cellular regulation. Its role in physiological processes and disease pathogenesis underscores its importance as a therapeutic target. Further investigations into the precise mechanisms and downstream effects of TGF-β1 signaling will contribute to the development of novel therapies for various human disorders.

References

Bibliography: Massagué, J. (2012). TGFβ signalling in context. Nature Reviews Molecular Cell Biology, 13(10), 616-630. Derynck, R., & Budi, E. H. (2019). Specificity, versatility, and control of TGF-β family signaling. Science, 361(6403), eaay5355. Batlle, E., & Massagué, J. (2019). Transforming growth factor-β signaling in immunity and

cancer. Immunity, 50(4), 924-940. Pickup, M. W., Mouw, J. K., & Weaver, V. M. (2014). The extracellular matrix modulates the hallmarks of cancer. EMBO Reports, 15(12), 1243-1253. Akhurst, R. J., & Hata, A. (2012). Targeting the TGFβ signalling pathway in disease. Nature Reviews Drug Discovery, 11(10), 790-811.

Precautions

TGFB1 Human is for research use only and not for use in diagnostic or therapeutic procedures.

Target Information: (P01137)

Background

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References for protein:

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