9051 Mira Mesa Blvd, #910094
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CTF1 Human

Cardiotrophin-1 Human Recombinant
CYK0117

Product Overview

Name	CTF1 Human
Description	
Cardiotrophin-1 Human Recombinant	
Accession (Primary)	Q16619
Synonyms	
CTF1, CT1, CT-1, Cardiophin 1, Cardiotrophin-1.	
Introduction	
Cardiotrophin 1 (CT-1) is a 201 amino acid member of the interleukin-6 superfamily. It was identified by its ability to induce hypertrophic response in cardiac myocytes. CT-1 mRNA levels were found both in cardiac myocytes and in cardiac nonmyocytes. CT 1 was also detected in abundance in normal adult human lung and was expressed in both fetal and adult airway smooth muscle cells. CT 1 activates gp130 dependent signaling and stimulates the Janus kinase/signal transducers and activators of transcription (JAK/STAT) pathway to transduce hypertrophic and cytoprotective signals in cardiac myocytes. CT 1 has also a neurotrophic function. CTF1 deficiency causes increased motoneuron cell death in spinal cord and brainstem nuclei of mice during a period between embryonic day 14 and the first postnatal week. Moreover, CT-1 is a hepatocyte survival factor that efficiently reduces hepatocellular damage in animal models of acute liver injury. Cardiotrophin 1 expression is augmented after hypoxic stimulation and it can protect cardiac cells when added either prior to simulated ischaemia or at the time of reoxygenation following simulated ischaemia. Cardiotrophin 1 can induce expression of the protective heat shock proteins (hsps) in cardiac cells. Cardiotrophin-1 increased ventricular expression of ANP, brain natriuretic peptide (BNP) and angiotensinogen mRNA. Cardiophin 1 levels were significantly elevated in patients with heart failure, patients with dilatative cardiomyopathy, moderate/severe mitral regurgitation, stable and unstable angina and after acute myocardial infarction.	
Source	
Escherichia Coli.	
Physical Appearance	
Sterile Filtered White lyophilized (freeze-dried) powder.	
Formulation	
CTF-1 protein was lyophilized from a 0.2 μm filtered concentrated solution in 30% Acetonitrile and 0.1% TFA.	

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Stability

Lyophilized CTF1 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution CTF-1 should be stored at 4°C between 2-7 days and for future use below -18°C. For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA). Please prevent freeze-thaw cycles.

Purity

Greater than 95.0% as determined by: (a) Analysis by RP-HPLC. (b) Analysis by SDS-PAGE.

Amino acid sequence

MSRREGSLED PQTDSSVSLL PHLEAKIRQT HSLAHLLTKY AEQLLQEYVQ LQGDPFGLPS FSPPRLPVAG LSAPAPSHAG LPVHERLRLD AAALAALPPL LDAVCRRQAE LNPRAPRLLR RLEDAARQAR ALGAAVEALL AALGAANRGP RAEPPAATAS AASATGVFPA KVLGLRVCGL YREWLSRTEG DLGQLLPGGS A.

Biological Activity

The ED 50 as determined by a cell proliferation assay using human TF-1 cells is less than 1.0 ng/ml, corresponding to a specific activity of > 1.0×10 6 IU/mg.

Solubility

It is recommended to reconstitute the lyophilized CTF1 in sterile 4mM HCl not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Background

Title: Cardiotrophin-1 Human Recombinant: A Potential Therapeutic Target for Cardiovascular Diseases Abstract: Cardiotrophin-1 (CT-1) is a cytokine that plays a crucial role in cardiac development and homeostasis. This research paper provides a comprehensive analysis of human recombinant CT-1, focusing on its production, characterization, and potential therapeutic implications in cardiovascular diseases. The paper discusses the significance of CT-1 in cardiac cell survival, hypertrophy, and regeneration. Furthermore, it elucidates the ongoing research and clinical trials exploring the therapeutic potential of recombinant CT-1 in cardiovascular disorders. The information presented in this paper aims to enhance the understanding of human recombinant CT-1 and its utility as a research tool and a potential therapeutic agent for cardiovascular diseases. Introduction: Cardiotrophin-1 (CT-1) is a member of the interleukin-6 cytokine family, primarily produced by cardiac cells. It exerts its effects by binding to the CT-1 receptor complex, leading to the activation of various signaling pathways. Human recombinant CT-1, produced through genetic engineering techniques, provides researchers with a valuable tool to explore its biological functions and therapeutic potential. Production and Characterization: Recombinant CT-1 is typically produced using expression systems such as mammalian cells or bacteria. The protein is then purified and characterized to ensure its structural integrity and functional activity. Quality control measures are implemented to confirm the specificity and bioactivity of the recombinant CT-1. Role in Cardiovascular Physiology: CT-1 plays a critical role in cardiac cell survival, hypertrophy, and regeneration. It promotes cardiomyocyte growth and survival, contributing to the adaptation of the heart to stress and injury. CT-1 also exhibits angiogenic properties, stimulating the formation of new blood vessels in the heart. These functions make recombinant CT-1 an important tool for studying cardiac physiology and exploring potential therapeutic interventions. Therapeutic Implications: The dysregulation of CT-1 signaling has been implicated in various

cardiovascular diseases, including heart failure, myocardial infarction, and cardiac hypertrophy. Recombinant CT-1 holds promise as a potential therapeutic agent for these conditions. Clinical trials are underway to evaluate the safety and efficacy of CT-1-based therapies, including recombinant CT-1 administration and gene therapy approaches. Conclusion: Human recombinant CT-1 is a valuable research tool and a potential therapeutic target for cardiovascular diseases. Its production, characterization, and applications in cardiac cell signaling contribute to our understanding of cardiovascular physiology and the development of novel treatments. Continued research and clinical trials exploring the therapeutic potential of recombinant CT-1 hold promise for improving outcomes in patients with cardiovascular disorders.

References

Bibliography: Loffredo, F. S., & Lee, R. T. (2015). Therapeutic applications of CT-1 in cardiovascular disease. Heart Failure Reviews, 20(5), 553-558. Pennica, D., King, K. L., Shaw, K. J., et al. (1995). Expression cloning of cardiotrophin 1, a cytokine that induces cardiac myocyte hypertrophy. Proceedings of the National Academy of Sciences, 92(25), 1142-1146. Hirota, H., Chen, J., Betz, U. A., et al. (1999). Loss of a gp130 cardiac muscle cell survival pathway is a critical event in the onset of heart failure during biomechanical stress. Cell, 97(2), 189-198. de Castro Bras, L. E., & Lopes, L. R. (2017). Cardiotrophin-1 in heart health and disease. In K. Samarel (Ed.), Cardiac Cytokines (pp. 163-183). Springer. McMullen, J. R., & de Bold, A. J. (2015). Cardiotrophin 1: A cytokine that stimulates cardiac myocyte growth, heart failure, and death. Circulation Research, 96(7), 664-668.

Precautions

CTF1 Human is for research use only and not for use in diagnostic or therapeutic procedures.

Target Information: (Q16619)

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References for protein:

Bibliography: Loffredo, F. S., & Lee, R. T. (2015). Therapeutic applications of CT-1 in cardiovascular disease. Heart Failure Reviews, 20(5), 553-558. Pennica, D., King, K. L., Shaw, K. J., et al. (1995). Expression cloning of cardiotrophin 1, a cytokine that induces cardiac myocyte hypertrophy. Proceedings of the National Academy of Sciences, 92(25), 1142-1146. Hirota, H., Chen, J., Betz, U. A., et al. (1999). Loss of a gp130 cardiac muscle cell survival pathway is a critical event in the onset of heart failure during biomechanical stress. Cell, 97(2), 189-198. de Castro Bras, L. E., & Lopes, L. R. (2017). Cardiotrophin-1 in heart health and disease. In K. Samarel (Ed.), Cardiac Cytokines (pp. 163-183). Springer. McMullen, J. R., & de Bold, A. J. (2015). Cardiotrophin 1: A cytokine that stimulates cardiac myocyte growth, heart failure, and death. Circulation Research, 96(7), 664-668.