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BD 4 Human

Beta Defensin-4 Human Recombinant
CYK0075

Product Overview

Name	BD 4 Human
Description	
Beta Defensin-4 Human Recombinant	
Accession (Primary)	Q8WTQ1
Synonyms	
HBD-4, DEFB-4, HBD4, DEFB104B, Beta-defensin 4, BD-4.	
Introduction	
Defensins are cationic peptides with a large spectrum of antimicrobial activity that comprise an important arm of the innate immune system. The Alpha defensins are differentiated from the Beta-defensins by the pairing of their 3 disulfide bonds. 4 human Beta-defensins have been identified to date; BD-1, BD-2, BD-3 and BD-4. Beta-defensins are expressed on some leukocytes and at epithelial surfaces. In addition to their direct antimicrobial activities, they are chemoattractant towards immature dendritic cells and memory T cells. The beta-defensin proteins are expressed as the C-terminal portion of precursors and are released by proteolytic cleavage of a signal sequence and, in the case of BD-1 (36 a.a.), a propeptide region. Beta-defensins contain a six-cysteine motif that forms three intra-molecular disulfide bonds. Beta-Defensins are 3-5 kDa peptides ranging in size from 33-47 amino acid residues.	
Source	
Escherichia Coli.	
Physical Appearance	
Sterile Filtered White lyophilized (freeze-dried) powder.	
Formulation	
The DEFB4 (1mg/ml) was lyophilized with 20mM sodium Phosphate buffer pH-7.4 and 130mM NaCl.	
Stability	
Lyophilized Beta Defensin-4 Recombinant although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution BD-3 should be stored at 4°C between 2-7 days and for future use below -18°C. Please prevent freeze-thaw cycles.	
Purity	
Greater than 98.0% as determined by: (a) Analysis by RP-HPLC. (b) Analysis by SDS-PAGE.	
Amino acid sequence	

EFELDRICGY GTARCRKKCR SQEYRIGRCP NTYACCLRKW DESLLNRTKP.

Biological Activity

Determined by its ability to chemoattract human monocytes using a concentration range of 0.1-50 ng/ml, corresponding to a specific activity of 20,000-10,000,000 units/mg.

Solubility

It is recommended to reconstitute the lyophilized Beta Defensin-4 in sterile 18MΩ-cm H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Background

Beta Defensin-4 Human Recombinant: Exploring the Potential of a Novel Antimicrobial Peptide Abstract: Beta Defensin-4 (hBD-4) human recombinant is a promising antimicrobial peptide with unique properties and potential therapeutic applications. This research paper provides an in-depth analysis of hBD-4, including its characteristics, mode of action, and potential uses. Furthermore, novel methodologies for the production and optimization of hBD-4 human recombinant are proposed, shedding light on its future implications in the field of infectious disease management. Introduction: In the face of increasing drug-resistant infections, alternative therapeutic strategies are crucial. Antimicrobial peptides, such as hBD-4, have gained attention due to their broad-spectrum activity against pathogens. This paper aims to explore the distinctive features of hBD-4 and propose innovative approaches for its production and optimization. Characteristics and Mode of Action: hBD-4 is a cationic peptide comprising 50 amino acids and is characterized by a unique structure that contributes to its antimicrobial properties. The mechanism of action involves the disruption of microbial membranes and subsequent cell death. Additionally, hBD-4 exhibits immunomodulatory effects, including the stimulation of chemotaxis and modulation of the inflammatory response. Production of hBD-4 Human Recombinant: Efficient production methodologies for hBD-4 human recombinant are essential for its therapeutic applications. Various expression systems, such as bacterial, yeast, and mammalian cell-based platforms, have been explored. Each system presents advantages and challenges, necessitating careful selection for high yields and protein quality. Optimization strategies, including codon optimization, fusion protein tags, and growth conditions, have been employed to enhance production efficiency. Purification techniques, such as chromatography and ultrafiltration, have been optimized to isolate high-quality hBD-4 recombinant. Potential Applications: hBD-4 human recombinant demonstrates potential therapeutic applications in combating drug-resistant pathogens. Its broad-spectrum antimicrobial activity against bacteria, viruses, and fungi positions it as a promising candidate for infectious disease management. Moreover, hBD-4 shows promise in wound healing and tissue regeneration due to its ability to promote angiogenesis and stimulate cell migration. Exploring its potential in combination with drug delivery systems for targeted therapy is an exciting avenue for future research. Conclusion: hBD-4 human recombinant represents a novel antimicrobial peptide with diverse potential applications. Optimizing production methodologies and elucidating its mechanisms of action will further enhance its clinical utility. With its broad-spectrum antimicrobial activity and potential implications in wound healing and targeted therapy, hBD-4 human recombinant holds promise as an innovative therapeutic agent.

References

Bibliography: Semple F, Dorin JR. Beta-defensins: multifunctional modulators of infection, inflammation and more? J Innate Immun. 2012;4(4):337-348. Rodríguez-Jiménez FJ, Krause A, Schulz S, Forssmann U, Conejo-García JR, Schreeb R. Distribution of new human beta-defensin genes clustered on chromosome 20 in functionally different segments of epididymis. Genomics. 2003;81(2):175-183. Harder J, Bartels J, Christophers E, Schroder JM. Isolation and characterization of human beta-defensin-3, a novel human inducible peptide antibiotic. J Biol Chem. 2001;276(8):5707-5713. Schibli DJ, Hunter HN, Aseyev V, et al. The solution structures of the human beta-defensins lead to a better understanding of the potent bactericidal activity of HBD3 against Staphylococcus aureus. J Biol Chem. 2002;277(10):8279-8289. Wu Z, Hoover DM, Yang D, Boulegue C, Santamaria F, Oppenheim JJ, Lubkowski J, Lu W. Engineering disulfide bridges to dissect antimicrobial and chemotactic activities of human β-defensin 3. Proc Natl Acad Sci U S A. 2003;100(15):8880-8885.

Precautions

BD 4 Human is for research use only and not for use in diagnostic or therapeutic procedures.

Target Information: (Q8WTQ1)

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References for protein:

Bibliography: Semple F, Dorin JR. Beta-defensins: multifunctional modulators of infection, inflammation and more? J Innate Immun. 2012;4(4):337-348. Rodríguez-Jiménez FJ, Krause A, Schulz S, Forssmann U, Conejo-García JR, Schreeb R. Distribution of new human beta-defensin genes clustered on chromosome 20 in functionally different segments of epididymis. Genomics. 2003;81(2):175-183. Harder J, Bartels J, Christophers E, Schroder JM. Isolation and characterization of human beta-defensin-3, a novel human inducible peptide antibiotic. J Biol Chem. 2001;276(8):5707-5713. Schibli DJ, Hunter HN, Aseyev V, et al. The solution structures of the human beta-defensins lead to a better understanding of the potent bactericidal activity of HBD3 against Staphylococcus aureus. J Biol Chem. 2002;277(10):8279-8289. Wu Z, Hoover DM, Yang D, Boulegue C, Santamaria F, Oppenheim JJ, Lubkowski J, Lu W. Engineering disulfide bridges to dissect antimicrobial and chemotactic activities of human β-defensin 3. Proc Natl Acad Sci U S A. 2003;100(15):8880-8885.