9051 Mira Mesa Blvd, #910094
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# BD 3 Human

*Beta Defensin-3 Human Recombinant*
*CYK0072*

## Product Overview

| | |
|---|---|
| Name | BD 3 Human |
| **Description** | |
| Beta Defensin-3 Human Recombinant | |
| Accession (Primary) | P81534 |
| **Synonyms** | |
| HBD3, HBP3, DEFB3, HBD-3, HBP-3, DEFB103. | |
| **Introduction** | |
| Defensins form a family of microbicidal and cytotoxic peptides made by neutrophils. Members of the defensin family are highly similar in protein sequence. This gene encodes defensin, beta 103A, which has broad spectrum antimicrobial activity and may play an important role in innate epithelial defense. | |
| **Source** | |
| Escherichia Coli. | |
| **Physical Appearance** | |
| Sterile Filtered lyophilized (freeze-dried) powder. | |
| **Formulation** | |
| The HBD-3 was lyophilized without additives. | |
| **Stability** | |
| Lyophilized Beta Defensin-3 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 95.0% as determined by(a) Analysis by RP-HPLC. (b) Analysis by SDS-PAGE. | |
| **Amino acid sequence** | |
| GIINTLQKYY CRVRGGRCAV LSCLPKEEQI GKCSTRGRKC CRRKK. | |
| **Solubility** | |
| It is recommended to reconstitute the lyophilized Beta Defensin-3 in sterile 18MΩ-cm H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions. | |
| **Background** | |

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Beta Defensin-3 Human Recombinant: Advancements in Antimicrobial Peptide Therapy Abstract: Beta Defensin-3 (hBD-3) human recombinant is a promising antimicrobial peptide with broad-spectrum activity against bacteria, viruses, and fungi. This research paper provides an overview of hBD-3, including its properties, mode of action, and potential applications. Additionally, novel methodologies for the production and optimization of hBD-3 human recombinant are discussed, highlighting its future implications in the field of infectious disease management. Introduction: The rise of drug-resistant pathogens necessitates exploring alternative therapeutic approaches, such as antimicrobial peptides. Beta Defensin-3 (hBD-3) human recombinant has emerged as a potent candidate due to its broad-spectrum antimicrobial activity. This paper aims to examine the unique features of hBD-3 and propose innovative methodologies for its production and optimization. Properties and Mode of Action: hBD-3 possesses a distinct structural composition consisting of 45 amino acids, including an N-terminal loop, three antiparallel β-strands, and a C-terminal α-helix. These structural elements contribute to its ability to disrupt microbial membranes and target selectivity. The mode of action involves electrostatic interactions with negatively charged microbial membranes, leading to membrane disruption and subsequent cell death. Furthermore, hBD-3 exhibits immunomodulatory functions by promoting chemotaxis, enhancing phagocytic activity, and modulating the release of pro-inflammatory cytokines. Production of hBD-3 Human Recombinant: Various expression systems, such as bacterial, yeast, and mammalian cell-based platforms, have been explored for the efficient production of hBD-3 human recombinant. Each system offers distinct advantages and challenges, requiring careful selection to achieve high yields and desired protein quality. Optimization strategies, including codon optimization, fusion protein tags, and appropriate growth conditions, have been employed to enhance production efficiency. Purification techniques, such as chromatography and ultrafiltration, have been optimized to isolate high-quality hBD-3 recombinant. Applications and Future Perspectives: hBD-3 human recombinant exhibits significant therapeutic potential against drug-resistant pathogens, making it a promising alternative to conventional antibiotics. It also demonstrates promise in wound healing and tissue regeneration by stimulating angiogenesis, extracellular matrix production, and keratinocyte migration. Moreover, the unique physicochemical properties of hBD-3 open avenues for its utilization in nanomedicine, enabling targeted therapy and improved drug delivery. Conclusion: hBD-3 human recombinant represents a potent antimicrobial peptide with broad-spectrum activity against diverse pathogens. The optimization of production methodologies and further exploration of its mechanisms of action will contribute to its clinical utility. With its potential applications in infectious disease management, wound healing, and nanomedicine, hBD-3 human recombinant holds promise as a versatile therapeutic agent.

## References

Bibliography: Valore EV, Park CH, Quayle AJ, Wiles KR, McCray PB Jr, Ganz T. Human beta-defensin-1: an antimicrobial peptide of urogenital tissues. J Clin Invest. 1998;101(8):1633-1642. Yang D, Biragyn A, Kwak LW, Oppenheim JJ. Mammalian defensins in immunity: more than just microbicidal. Trends Immunol. 2002;23(6):291-296. Sørensen OE, Thapa DR, Rosenthal A, et al. Differential regulation of beta-defensin expression in human skin by microbial stimuli. J Immunol. 2005;174(8):4870-4879. Eckert R, He J, Yarbrough D, et al. Targeted killing of Streptococcus mutans by a pheromone-guided "smart" antimicrobial peptide. Antimicrob Agents Chemother. 2006;50(11):3651-3657. Mookherjee N, Anderson MA, Haagsman HP, Davidson DJ. Antimicrobial host defence

peptides: functions and clinical potential. Nat Rev Drug Discov. 2020;19(5):311-332.

**Precautions**

BD 3 Human is for research use only and not for use in diagnostic or therapeutic procedures.

# Target Information: ( P81534 )

# Background

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## References for protein:

Bibliography: Valore EV, Park CH, Quayle AJ, Wiles KR, McCray PB Jr, Ganz T. Human beta-defensin-1: an antimicrobial peptide of urogenital tissues. J Clin Invest. 1998;101(8):1633-1642. Yang D, Biragyn A, Kwak LW, Oppenheim JJ. Mammalian defensins in immunity: more than just microbicidal. Trends Immunol. 2002;23(6):291-296. Sørensen OE, Thapa DR, Rosenthal A, et al. Differential regulation of beta-defensin expression in human skin by microbial stimuli. J Immunol. 2005;174(8):4870-4879. Eckert R, He J, Yarbrough D, et al. Targeted killing of Streptococcus mutans by a pheromone-guided "smart" antimicrobial peptide. Antimicrob Agents Chemother. 2006;50(11):3651-3657. Mookherjee N, Anderson MA, Haagsman HP, Davidson DJ. Antimicrobial host defence peptides: functions and clinical potential. Nat Rev Drug Discov. 2020;19(5):311-332.