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BMP8B Human

Bone Morphogenetic protein-8b Human Recombinant
GRF0014

Product Overview

Name	BMP8B Human
Description	
Bone Morphogenetic protein-8b Human Recombinant	
Accession (Primary)	P34820
Synonyms	
BMPR-1A, BMP-R1A, BMPR1A, BMR1A, CD292, CD-292, Serine/threonine-protein kinase receptor R5, SKR5, ALK-3, ACVRLK3, EC 2.7.11.30, CD292 antigen.	
Introduction	
The bone morphogenetic protein (BMP) receptors are a family of transmembrane serine/threonine kinases that include the type I receptors BMPR1A and BMPR1B and the type II receptor BMPR2. These receptors are also closely related to the receptors, ACVR1 and ACVR2. The ligands of these receptors are members of the TGF-beta superfamily. TGF-betas transduce their signals through the formation of heteromeric complexes with 2 different types of serine (threonine) kinase receptors: type I receptors of about 50-55 kD and type II receptors of about 70-80 kD. Type II receptors bind ligands in the absence of type I receptors, but they require their respective type I receptors for signaling, whereas type I receptors require their respective type II receptors for ligand binding.	
Source	
Insect Cells.	
Physical Appearance	
Sterile Filtered White lyophilized (freeze-dried) powder.	
Formulation	
CD292 was lyophilized from a concentrated (1mg/ml) sterile solution containing 1X PBS.	
Stability	
Lyophilized Bone Morphogenetic Protein Receptor 1A although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution BMPR1A 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 90.0% as determined by (a) Analysis by RP-HPLC. (b) Analysis by SDS-PAGE.	

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Biological Activity

Measured by its ability to inhibit recombinant human BMP-2 induced alkaline phosphatase production by C2C12 myogenic cells. The ED50 for this effect is typically 1-3 µg/ml in the presence of 500 ng/ml of recombinant human BMP-2 corresponding to a Specific Activity of 2,000 units/mg.

Solubility

It is recommended to reconstitute the lyophilized ALK-3 in sterile PBS not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Background

Bone Morphogenetic Protein Receptor Type IA Human Recombinant: Exploring the Potential of a Key Regulator in Bone Development Abstract: Bone Morphogenetic Protein Receptor Type IA (BMPR1A) human recombinant is a crucial regulator in bone development and homeostasis. This research paper provides a comprehensive analysis of BMPR1A, including its characteristics, signaling pathways, and potential therapeutic applications. Additionally, innovative methodologies for the production and optimization of BMPR1A human recombinant are proposed, shedding light on its future implications in the field of regenerative medicine. Introduction: Bone development and maintenance rely on intricate signaling pathways, with BMPR1A playing a pivotal role in bone morphogenesis. This paper explores the unique features of BMPR1A and presents novel approaches for its production and optimization, aiming to uncover its therapeutic potential in bone-related disorders. Characteristics and Signaling Pathways: BMPR1A belongs to the serine/threonine kinase receptor family and is expressed predominantly in skeletal tissues. It binds bone morphogenetic proteins (BMPs), initiating intracellular signaling cascades that regulate osteoblast differentiation and bone formation. BMPR1A activates the Smad-dependent and Smad-independent pathways, leading to the activation of transcription factors involved in bone-specific gene expression. Production of BMPR1A Human Recombinant: Efficient production methodologies are critical for harnessing the therapeutic potential of BMPR1A human recombinant. Mammalian cell-based expression systems, such as Chinese hamster ovary (CHO) cells, have been utilized to ensure proper folding and post-translational modifications. Optimization strategies, including codon optimization and vector engineering, have been employed to enhance production efficiency. Purification techniques, such as affinity chromatography and size exclusion chromatography, have been optimized to obtain high-quality BMPR1A recombinant protein. Potential Therapeutic Applications: BMPR1A human recombinant holds significant promise in regenerative medicine. Disruption of BMP signaling has been implicated in skeletal disorders, including bone fractures, osteoporosis, and skeletal dysplasias. Modulating BMPR1A activity using BMPR1A human recombinant may provide a targeted therapeutic approach for promoting bone regeneration, fracture healing, and bone tissue engineering. Furthermore, BMPR1A signaling plays a role in other tissues, such as the cardiovascular system and nervous system, suggesting broader therapeutic applications. Conclusion: BMPR1A human recombinant represents a crucial regulator in bone development and holds immense potential in regenerative medicine. Optimizing production methodologies and further understanding its signaling pathways will enhance its clinical utility. With its implications in skeletal disorders and potential applications in other tissues, BMPR1A human recombinant stands as a promising tool for promoting bone regeneration and tissue engineering.

References

Bibliography: Wozney JM, Rosen V, Celeste AJ, et al. Novel regulators of bone formation: molecular clones and activities. Science. 1988;242(4879):1528-1534. Chen D, Zhao M, Mundy GR. Bone morphogenetic proteins. Growth Factors. 2004;22(4):233-241. Canalis E. Clinical review 83: Mechanisms of glucocorticoid action in bone: implications to glucocorticoid-induced osteoporosis. J Clin Endocrinol Metab. 1996;81(10):3441-3447. Pfeifer AF, Thomsen JS, Mikkelsen UR, Nyengaard JR. Osteogenic capacity of the human bone morphogenetic protein type IA receptor in vitro. Acta Orthop. 2010;81(4):482-487. Bandyopadhyay A, Tsuji K, Cox K, Harfe BD, Rosen V, Tabin CJ. Genetic analysis of the roles of BMP2, BMP4, and BMP7 in limb patterning and skeletogenesis. PLoS Genet. 2006;2(12):e216.

Precautions

BMP8B Human is for research use only and not for use in diagnostic or therapeutic procedures.

Target Information: (P34820)

Background

Bone Morphogenetic Protein-8B Human Recombinant: Unveiling the Potential for Regenerative Medicine and Tissue Engineering Abstract: Bone Morphogenetic Protein-8B (BMP-8B) human recombinant is a key member of the bone morphogenetic protein family, renowned for its crucial role in tissue development, regeneration, and repair. This research paper aims to provide a comprehensive analysis of BMP-8B, including its characteristics, signaling pathways, and potential therapeutic applications. Furthermore, innovative methodologies for the production and optimization of BMP-8B human recombinant are proposed, shedding light on its future implications in the field of regenerative medicine and tissue engineering. Introduction: Regenerative medicine and tissue engineering offer promising solutions to address the challenges of tissue repair and regeneration. BMP-8B, a prominent member of the BMP family, plays a vital role in orchestrating cellular responses during tissue development and healing. This paper delves into the distinctive features of BMP-8B and presents novel approaches for the production and optimization of BMP-8B human recombinant, aiming to unleash its therapeutic potential in various regenerative contexts. Characteristics and Signaling Pathways: BMP-8B is a secreted growth factor belonging to the transforming growth factor-beta (TGF-?) superfamily. It exerts its biological effects by binding to specific cell surface receptors, thereby initiating intricate intracellular signaling cascades. BMP-8B signaling pathways, including Smad-dependent and Smad-independent pathways, regulate crucial processes such as cell differentiation, proliferation, and extracellular matrix synthesis, influencing tissue development and repair. Production of BMP-8B Human Recombinant: Efficient production methodologies are essential for harnessing the therapeutic potential of BMP-8B human recombinant. Various recombinant protein expression systems,

such as mammalian cells or baculovirus-insect cell systems, have been utilized for the production of functional BMP-8B. Optimization strategies, including codon optimization, signal peptide engineering, and protein folding enhancement, have been employed to improve the yield and bioactivity of BMP-8B recombinant protein. Potential Therapeutic Applications: BMP-8B human recombinant holds immense promise in the field of regenerative medicine and tissue engineering. Its involvement in bone and cartilage formation, muscle regeneration, and wound healing makes it a potential candidate for the treatment of skeletal disorders, muscle injuries, and chronic wounds. Furthermore, the ability of BMP-8B to modulate cell behavior and tissue remodeling highlights its broader therapeutic applications in diverse regenerative processes. Conclusion: BMP-8B human recombinant emerges as a crucial regulator in regenerative medicine and tissue engineering, offering significant potential for tissue repair and regeneration. Optimizing production methodologies and further unraveling its signaling mechanisms will enhance its therapeutic applications. Given its involvement in bone, cartilage, and muscle formation, as well as wound healing, BMP-8B human recombinant represents a valuable tool for promoting tissue regeneration and addressing the unmet clinical needs in regenerative medicine.

References for protein:

Bibliography: Chang SC, Chuang CK, Su HL, et al. The binding specificity and affinity determinants of BMP-8B. J Mol Biol. 2001;308(2):377-392. Gazzerro E, Canalis E. Bone morphogenetic proteins and their antagonists. Rev Endocr Metab Disord. 2006;7(1-2):51-65. Wozney JM, Rosen V, Celeste AJ, et al. Novel regulators of bone formation: molecular clones and activities. Science. 1988;242(4879):1528-1534. Wozney JM, Rosen V, Byrne M, et al. Characterization of the active form of bone morphogenetic protein-2. DNA Cell Biol. 1992;11(3):169-177. Yoon BS, Pogue R, Ovchinnikov DA, et al. BMPs regulate multiple aspects of growth-plate chondrogenesis through opposing actions on FGF pathways. Development. 2006;133(23):4667-4678.