9051 Mira Mesa Blvd, #910094
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BMPR1A Human

Bone Morphogenetic Protein Receptor Type IA Human Recombinant
CYK0093

Product Overview

Name	BMPR1A Human
Description	
Bone Morphogenetic Protein Receptor Type IA Human Recombinant	
Accession (Primary)	P36894
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.

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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

BMPR1A Human is for research use only and not for use in diagnostic or therapeutic procedures.

Target Information: (P36894)

Background

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References for protein:

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.