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ACVR1 Human

Activin A Receptor Type 1 Human Recombinant

GRF0009

Product Overview

Name	ACVR1 Human
Catalog #	GRF0009
Accession(Primary)	Q04771
Description	Activin A Receptor Type 1 Human Recombinant
Precautions	

Target information(Q04771)

Synonyms

Gene ID

Other Names

Function

Cellular location

Note

Background

Functional Implications and Therapeutic Prospects of Activin A Receptor Type 1 Human Recombinant 1. Abstract This study illuminates the functional roles and potential therapeutic applications of Activin A Receptor Type 1 Human Recombinant (ACVR1), a crucial protein in the TGF-beta superfamily signaling pathway. Through a comprehensive review of its structure, signaling mechanism, biological functions, and disease associations, this paper aims to elucidate the current understanding of ACVR1 and its potential therapeutic implications in various disease states. 2. Introduction The Activin A Receptor Type 1 Human Recombinant, abbreviated as ACVR1, is a receptor protein vital for transmitting cellular signals in the Transforming Growth Factor-beta (TGF-beta) superfamily pathway. Known to play pivotal roles in organogenesis, bone growth, and cell differentiation, the ACVR1 and its functions present vast

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therapeutic potential. 3. Structure and Signaling of ACVR1 ACVR1 is a transmembrane serine/threonine kinase receptor, characterized by an extracellular ligand-binding domain and an intracellular kinase domain for signal transduction. Binding of ligands such as Activin A leads to the formation of heteromeric complexes with type II receptors, triggering phosphorylation events that activate downstream signaling pathways. 4. Biological Functions of ACVR1 Being a part of the TGF-beta superfamily signaling pathway, ACVR1 is implicated in a broad spectrum of biological processes. It is crucial for embryonic development, cellular proliferation, differentiation, apoptosis, and homeostasis. It also plays a significant role in bone morphogenesis, contributing to skeletal patterning and growth. 5. ACVR1 in Disease Pathology The dysregulation of ACVR1 has been associated with various pathological conditions, including Fibrodysplasia Ossificans Progressiva (FOP), a rare genetic disorder characterized by progressive ossification of soft tissues. Mutations in ACVR1 lead to enhanced BMP signaling, causing aberrant bone formation. This highlights the critical role of ACVR1 in skeletal homeostasis and disease. 6. Therapeutic Potential of ACVR1 Given the central role of ACVR1 in cellular signaling and its association with disease, it presents a promising target for therapeutic intervention. Strategies to modulate ACVR1 signaling could potentially ameliorate symptoms of diseases like FOP, offering promising avenues for novel therapeutic approaches. 7. Conclusion and Future Perspectives While our understanding of ACVR1's functional roles has expanded significantly over the years, much remains to be elucidated. Further research into the precise molecular mechanisms of ACVR1 and its pathway will pave the way for therapeutic advances, enhancing our capability to combat various diseases.