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Recombinant Human, Mouse, Rat, Rhesus, Canine BMP-2 Protein

Catalog Number:	633501, 633502
Size:	20 μg, 100 μg
Target Name:	BMP2, BMP-2,Bone morphogenetic protein 2, bone morphogenetic protein 2A (BMP-2A), BDA2
Regulatory Status:	RUO

PRODUCT DETAILS

Application:	Bioassay
Format:	Lyophilized from sterile 0.1% TFA, 30% ACN.
Expression Host:	E.coli
Species:	Human, Mouse, Rat, Rhesus, Canine
accession number:	NP_001191.1
Sources:	A DNA sequence encoding the mature form of human / mouse / rat / rhesus / canine BMP2 (NP_001191.1) (Gln283-Arg396) was expressed with an initial Met. The mature form sequences of human, mouse, rat, rhesus and canine BMP2 are identical.
Molecular Weight:	The recombinant human / mouse / rat / rhesus / canine BMP2 consists of 115 amino acids and has a predicted molecular mass of 13 KDa. It migrates as an approximately 14 KDa band in SDS-PAGE under reducing conditions.
Affinity Tag:	None
Purity:	≥95% as determined by SDS-PAGE.
Endotoxin level:	< 0.1 EU per μg protein
Protein Concentration:	Lyophilized
Storage and Handling:	Samples are stable for up to twelve months from date of receipt at -20℃ to -80℃. Store it under sterile conditions at -20℃ to -80℃. It is recommended that the protein be aliquoted for optimal storage. Avoid repeated freeze-thaw cycles.

BACKGROUND INFORMATION

Human bone morphogenetic protein 2 (BMP-2), also known as BMP2, is a secreted growth factor belonging to the transforming growth factor-beta (TGF-β) superfamily. It plays a critical role in embryonic development, skeletal formation, cartilage differentiation, and bone remodeling. BMP-2 stimulates mesenchymal stem cells and progenitor cells to differentiate into osteoblasts, promoting extracellular matrix production and mineralization. It also participates in tissue repair and the maintenance of skeletal homeostasis.

Human BMP-2 is synthesized as a precursor protein of 396 amino acids, which undergoes proteolytic processing to generate the mature growth factor. The mature protein contains 114 amino acids per monomer and forms a biologically active, disulfide-linked homodimer. Each monomer adopts a characteristic cystine-knot structure stabilized by three intramolecular disulfide bonds, a

hallmark of the TGF-β superfamily. This structure supports protein stability, receptor binding, and biological activity.

BMP-2 binds to specific cell-surface serine/threonine kinase receptors, primarily BMP receptor type IA (BMPR-IA/ALK3) and BMP receptor type IB (BMPR-IB/ALK6), together with type II receptors such as BMPR-II, activin receptor type IIA (ActRIIA), and activin receptor type IIB (ActRIIB). Receptor complex formation activates downstream signaling, particularly the SMAD1/5/9 pathway, as well as non-SMAD pathways such as MAPK, regulating gene expression, cell differentiation, and tissue development. Extracellular proteins, including noggin and chordin, can bind BMP-2 and inhibit its signaling.

Dysregulated BMP-2 signaling is associated with abnormal bone formation, skeletal disorders, tissue fibrosis, and aspects of cancer progression, although its effects depend on the tissue and disease context. Recombinant human BMP-2 (rhBMP-2) is used clinically in selected orthopedic and spinal fusion procedures to promote bone regeneration. It is also being investigated for bone defect repair, dental and craniofacial reconstruction, and tissue engineering. However, excessive or inappropriate BMP-2 activity can cause complications, including ectopic bone formation and inflammation, making controlled delivery and dosage important considerations in therapeutic applications.

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