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BMP-2

Catalog # PVGS1134

Product Information

Primary Accession	P12643
Species	Human
Sequence	Gln283-Arg396
Purity	> 95% as analyzed by SDS-PAGE > 95% as analyzed by HPLC
Endotoxin Level	
Biological Activity	Assay #1: Measured by its ability to induce alkaline phosphatase production by ATDC-5 Cells. The ED_{50} for this effect is typically 0.07-0.2 □g/ml.Assay #2: Measured by its ability to induce alkaline phosphatase production by C2C12 cells. The ED_{50} for this effect is typically 0.2-1 □g/ml.
Expression System	E. coli
Formulation	Lyophilized after extensive dialysis against 50 mM acetic acid.
Reconstitution	It is recommended that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Reconstitute the lyophilized powder in 20 mM AcOH or 5 mM HCl up to 100 □g/ml.
Storage & Stability	Upon receiving, this product remains stable for up to 6 months at lower than -70°C. Upon reconstitution, the product should be stable for up to 1 week at 4°C or up to 3 months at -20°C. For long term storage it is recommended that a carrier protein (example 0.1% BSA) be added. Avoid repeated freeze-thaw cycles.

Additional Information

Gene ID	650
Other Names	Bone morphogenetic protein 2, BMP-2, Bone morphogenetic protein 2A, BMP-2A, BMP2, BMP2A
Target Background	Human Bone Morphogenetic Protein-2 (BMP-2) is a bone-growth regulatory factor and belongs to the transforming growth factor-beta (TGF-beta) superfamily. Human Bone Morphogenetic Protein-2 (BMP-2) is synthesized as large precursor molecule (Met1-Arg396, with a signal peptide from Met1 to Gly23), propeptide (Leu24-Arg282) of which is cleaved by PCSK5 (Proprotein Convertase Subtilisin/Kexin type 5). The active form consists of a dimer of two identical proteins which are linked by a disulfide bond at Cys360. It plays an important role in the development of bone and cartilage, cardiac cell differentiation and epithelial to mesenchymal transition. It is also involved in the hedgehog pathway, TGF-beta signaling pathway, and in cytokine-cytokine

receptor interaction.

Protein Information

Name	BMP2
Synonyms	BMP2A
Function	Growth factor of the TGF-beta superfamily that plays essential roles in many developmental processes, including cardiogenesis, neurogenesis, and osteogenesis (PubMed:18436533, PubMed:24362451, PubMed:31019025). Induces cartilage and bone formation (PubMed:3201241). Initiates the canonical BMP signaling cascade by associating with type I receptor BMPR1A and type II receptor BMPR2 (PubMed:15064755, PubMed:17295905, PubMed:18436533). Once all three components are bound together in a complex at the cell surface, BMPR2 phosphorylates and activates BMPR1A (PubMed:7791754). In turn, BMPR1A propagates signal by phosphorylating SMAD1/5/8 that travel to the nucleus and act as activators and repressors of transcription of target genes. Also acts to promote expression of HAMP, via the interaction with its receptor BMPR1A/ALK3 (PubMed:31800957). Can also signal through non-canonical pathways such as ERK/MAP kinase signaling cascade that regulates osteoblast differentiation (PubMed:16771708, PubMed:20851880). Also stimulates the differentiation of myoblasts into osteoblasts via the EIF2AK3-EIF2A-ATF4 pathway by stimulating EIF2A phosphorylation which leads to increased expression of ATF4 which plays a central role in osteoblast differentiation (PubMed:24362451). Acts as a positive regulator of odontoblast differentiation during mesenchymal tooth germ formation, expression is repressed during the bell stage by MSX1-mediated inhibition of CTNNB1 signaling (By similarity).
Cellular Location	Secreted.
Tissue Location	Particularly abundant in lung, spleen and colon and in low but significant levels in heart, brain, placenta, liver, skeletal muscle, kidney, pancreas, prostate, ovary and small intestine