

Product Information

Anti-Bone Morphogenetic Protein Receptor IA

produced in goat, affinity isolated antibody

Product Number **B 3930**

Product Description

Anti-Human Bone Morphogenetic Protein Receptor IA (BMPR-IA) is developed in goat using a purified recombinant human BMPR-IA expressed in mouse NSO cells as immunogen. Affinity isolated antigen specific antibody is obtained from goat anti-BMPR-IA antiserum by immuno-specific purification which removes essentially all goat serum proteins, including immunoglobulins, which do not specifically bind to the peptide.

Anti-Human Bone Morphogenetic Protein Receptor IA recognizes recombinant human BMPR-IA by various immunochemical techniques including immunoblotting and ELISA. Based on immunoblotting, this antibody exhibits no cross-reactivity with recombinant human BMP-2, BMP-4, BMP-5, BMP-6, or BMP-7.

Bone Morphogenetic Protein Receptor IA (BMPR-IA)/Fc Chimera is produced from the extracellular domain of human BMPR-IA protein fused to the carboxy-terminal 6X histidine-tagged Fc region of human IgG1, from a polypeptide linker.¹ Each subunit of human BMPR-IA, a homodimeric protein with a blocked amino-terminus, contains 372 amino acid residues (residues 24-152 of BMPR-IA plus 243 amino acid residues from the Fc and peptide linkers). The calculated molecular mass of each subunit is approximately 41.5 kDa. Due to glycosylation, BMPR-IA migrates as a 55 kDa protein under reducing conditions in SDS-PAGE. Human and mouse BMPR-IA are highly conserved and share 98 % amino acid sequence identity.

Bone Morphogenetic Proteins (BMP) are members of the TGF- β superfamily of cytokines that affect bone and cartilage formation.^{2,3,4} Similar to other TGF- β family proteins, BMPs are highly conserved across animal species. Mature BMPs are 30-38 kDa proteins that assume a TGF- β -like cysteine knot configuration.

Unlike TGF- β , BMPs do not form latent complexes with their propeptide counterparts. Most BMPs are homodimers, but bioactive natural heterodimers have been reported. It was found that lovastatin (Mevinolin, Sigma Product M2147), widely used for lowering cholesterol, also increases bone formation by turning on a gene (bmp-2) that promotes local bone formation.⁵ BMPs are involved in embryogenesis and morphogenesis of various tissues and organs. They create an environment conducive for bone marrow development by stimulating the production of specific bone matrix proteins and altering stromal cell and osteoclast proliferation.^{6,7} In addition to stimulating ectopic bone and cartilage development, BMPs may be an important factor in the development of the viscera. BMPs regulate the growth, differentiation, chemotaxis, proliferation, and apoptosis of various cell types, including mesenchymal cells, epithelial cells, hematopoietic cells, and neuronal cells.^{2,8} BMPs also appear to be responsible for normal dorsal/ventral patterning and can be found in tissues that induce bone or cartilage growth, such as demineralized bone and urinary epithelium.

Cellular responses to BMPs are mediated by the formation of hetero-oligomeric complexes of the type I and type II serine/threonine kinase receptors⁹ which play significant roles in BMP binding and signaling. Bone Morphogenetic Protein Receptor IA (BMPR-IA), also known as activin receptor-like kinase (ALK)-3, is a type I serine/threonine kinase required for the signal transduction of the TGF- β family cytokines. BMP receptors include the type I receptors, BMPR-1A and BMPR-1B (50-55 kDa), and the type II receptor BMPR-II (70-80 kDa). These receptors are also closely related to the activin receptors ACV R1 and ACV R2.

Type I receptors involved in BMP signaling can independently bind the various BMP family proteins in the absence of type II receptors. Soluble BMPR-IA binds BMP-4 with high-affinity in solution and is a potent BMP-4 antagonist *in vitro*. In adult tissues, BMPR-IA is widely expressed, but the highest expression levels are found in skeletal muscle. BMPR-IA is also widely expressed during embryogenesis

Reagent

The antibody is supplied as 100 µg of antiserum lyophilized from a 0.2 µm filtered solution of phosphate buffered saline.

Preparation Instructions

To one vial of lyophilized powder, add 1 ml of sterile phosphate buffered saline (PBS) to produce a 0.1 mg/ml stock solution of antibody.

Storage/Stability

Prior to reconstitution, store at -20 °C. Reconstituted product may be stored at 2 °C to 8 °C for at least one month. For prolonged storage, freeze in working aliquots at -20 °C. Avoid repeated freezing and thawing. Do not store in a frost-free freezer.

Product Profile

For immunoblotting, a working antibody concentration of 0.1-0.2 µg/mL is recommended. The detection limit for recombinant human BMPR-IA is ~20 ng/lane under non-reducing and reducing conditions.

For ELISAs, a working antibody concentration of 0.5-1.0 µg/mL is recommended. The detection limit for recombinant human BMP-5 is ~1.2 ng/well.

Note: In order to obtain the best results in various techniques and preparations, we recommend determining optimal working dilutions by titration.

References

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