

Product Information

ACTIVIN RECEPTOR IIA/Fc CHIMERA

Human, Recombinant

Expressed in insect *Sf* 21 cells

Product Number **A 8699**

Product Description

Recombinant human Activin Receptor IIA is a chimeric protein expressed in insect *Sf* 21 cells. A DNA sequence encoding the extracellular domain of the human activin receptor IIA protein¹, is fused to the carboxy-terminal 6X histidine-tagged Fc region of human IgG1 via a polypeptide linker. Recombinant human activin receptor IIA/Fc chimera, generated after removal of the 24 residue signal peptide, is a disulfide-linked dimeric protein. Each monomer has 354 amino acid residues with a calculated molecular mass of approximately 40 kDa. Due to glycosylation, monomeric activin receptor IIA/ Fc migrates as a 50 kDa protein in SDS-PAGE under reducing conditions. Human, mouse, and rat type II activin receptors share greater than 98 % homology.

Activin is secreted by Sertoli² cells in the testis and granulosa cells in the ovary. In early studies, this peptide was thought to be an inhibin and not recognized as a unique compound.^{3,4} Activins and inhibins are members of the TGF- β superfamily due to amino acid homology with respect to the conservation of 7 of the 9 cysteine residues common to all TGF- β forms.⁴ Activins are homodimers or heterodimers of the various β subunit isoforms, while inhibins are heterodimers of a unique α subunit and one of the various β subunits.⁵ Five β subunits have been cloned (mammalian β_A , β_B , β_C , β_E , and *Xenopus* β_D).⁴ The activin/inhibin nomenclature reflects the subunit composition of the proteins: activin A (β_A - β_A), activin B (β_B - β_B), activin AB (β_B - β_A), inhibin A (α - β_A), and inhibin B (α - β_B).

Activins have a wide range of biological activities including mesoderm induction^{6,7}, neural cell differentiation, bone remodeling, hematopoiesis, and reproductive physiology. Activins are involved in growth and differentiation of several tissues from different species.^{2,3,7,8} This protein also plays a key role in the production and regulation of hormones such as FSH, LH, GnRH, and ACTH. Activin influences erythropoiesis and the potentiation of erythroid colony formation, oxytocin secretion, paracrine, and autocrine regulation.³

Similar to other TGF- β family members, activins exert their biological activities through the effects of the heterodimeric complex composed of two membrane spanning serine-threonine kinases designated type I and type II receptors.⁹ Activin type I and type II receptors are distinguished by the level of sequence homology of their kinase domains and other structural and functional features. To date, seven type I and five type II activin receptors have been cloned from mammals, including activin receptor IA, activin receptor IIA, activin receptor IB, and activin receptor IIB. In addition, two splice variants of activin receptor IIA and five splice variants of activin receptor IIB have been reported.¹⁰

Type I activin receptors do not bind directly to activin but will associate with the type II receptor-activin complex and initiate signal transduction.¹¹ Recombinant soluble activin type II receptors are highly conserved, bind activin with high affinity, and are potent activin antagonists. Activin receptor IIA will also bind inhibin, BMP-2, and BMP-7 with lower affinities.

Reagent

Activin Receptor IIA is supplied as approximately 100 μ g of protein lyophilized from a 0.2 μ m filtered solution in phosphate buffered saline (PBS) containing 5 mg bovine serum albumin.

Preparation Instructions

Reconstitute the contents of the vial using sterile phosphate-buffered saline (PBS) containing 0.1 % human serum albumin or bovine serum albumin. Prepare a stock solution of no less than 50 μ g/ml.

Storage/Stability

Store at -20 °C. Upon reconstitution, store at 2 °C to 8 °C for one month. For extended storage, freeze in working aliquots at. Repeated freezing and thawing is not recommended.

Product Profile

Activin Receptor IIA is measured by its ability to inhibit hemoglobin expression induced by Activin in human

K562 erythroleukemia cells.¹² Approximately 0.03 µg/ml to 0.1 µg/ml of recombinant human activin receptor IIA/Fc will inhibit 50 % of the biological response due to 3 ng/ml of recombinant human Activin A. Purity: >95 % as determined by SDS-PAGE, visualized by silver stain. Endotoxin: <0.1 ng/µg determined by the LAL method.

References

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