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# Product Information

**Activin A, active, human**
**recombinant, expressed in *Nicotiana benthamiana***

Catalog Number **A4362**
Storage Temperature –20 °C

## Product Description

Activins are homodimers or heterodimers of the various β subunit isoforms belonging to the TGF-β family. Mature activin A has two 116 amino acid residue $\beta_A$ subunits ($\beta_A$-$\beta_A$). Activin exhibits a wide range of biological activities, including mesoderm induction, neural cell differentiation, bone remodeling, hematopoiesis, and reproductive physiology. Activins play a key role in the production and regulation of hormones such as FSH, LH, GnRH, and ACTH. Cells known to express activin A include fibroblasts, endothelial cells, hepatocytes, vascular smooth muscle cells, macrophages, keratinocytes, osteoclasts, bone marrow monocytes, prostatic epithelium, neurons, chondrocytes, osteoblasts, Leydig cells, Sertoli cells, and ovarian granulosa cells.

As with other members of the superfamily, activins interact with two types of cell surface transmembrane receptors (Types I and II), which have intrinsic serine/threonine kinase activities in their cytoplasmic domains, activin type I receptors (ACVR1, ACVR1B, and ACVR1C) and activin type II receptors (ACVR2A and ACVR2B). The biological activity of activin A can be neutralized by inhibins and by the diffusible TGF-β antagonist, follistatin.

Recombinant, human activin A is produced by transient expression of activin A in non-transgenic plants. It is a disulfide-linked homodimer of two $\beta_A$ chains, each containing 116 amino residues with a 6-His-tag at the N-terminal end.

Activin A, active is purified by sequential chromotography (FPLC). It is an animal component-free product, containing no animal-derived components or impurities. The recombinant protein is lyophilized from a solution of 0.05 M Tris-HCl, pH 7.4

Molecular mass: 27.4 kDa

$\beta_A$ chain sequence:
HHHHHHGLECDGKVNICCKKQFFVSFKDIGWNDWIIA
PSGYHANYCEGECPSHIAGTSGSSLSFHSTVINHYRM
RGHSPFANLKSCCVPTKLRPMSMLYYDDGQNIIKKDI
QNMIVEECGCS

Purity: >97% (SDS-PAGE)

$ED_{50}$: ≤5 ng/mL

Biological activity: The biological activity of activin A is measured by its ability to inhibit mouse plasmacytoma cell line (MPC-11) cells proliferation ([$^3$H]thymidine incorporation).

Endotoxin: <0.04 EU/1 μg of the protein (LAL method)

## Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

## Preparation Instructions

The lyophilized protein should be reconstituted in water to a concentration of 50 ng/μL. It is recommended to use a carrier protein (0.1% HSA or BSA). Due to the nature of the protein, dimers and multimers may be observed.

## Storage/Stability

The product is shipped ambient. Upon receiving, store it immediately at –20 °C.

Upon reconstitution, this enzyme can be aliquoted and stored under sterile conditions at –20 °C. Avoid repeated freeze/thaw cycles.

**References**


1. Vale W. et al., The inhibin/Activin family of hormones and growth factors. in Peptide Growth Factors and their Receptors: Handbook of Experimental Physiology. eds. Sporn, M., and Roberts, A., Springer-Verlag (Berlin: 1990) 95, 211–248.
2. Schwall, R.H., and Lai, C., Erythroid differentiation bioassys for activin. Methods Enzymol., **198**, 340-346 (1991).
3. Sulyok, S. et al., Activin: an important regulator of wound repair, fibrosis, and neuroprotection. Mol. Cell. Endocrinology, **225**(1-2), 127–32 (2004).
4. Bamberger, C. et al., Activin controls skin morphogenesis and wound repair predominantly via stromal cells and in a concentration-dependent manner via keratinocytes. Am. J. Pathol., **167**(3), 733–47 (2005).
5. Chen, Y.G. et al., Activin signalling and its role in regulation of cell proliferation, apoptosis, and carcinogenesis. Exp. Biol. Med., **231**(5), 534–44 (2006).
6. Phillips, D.J. et al., A sensitive and specific *in vitro* bioassay for activin using a mouse plasmacytoma cell line, MPC-11. J. of Endocrinology, **162**, 111-116 (1999).


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