

DESCRIPTION

Source Chinese Hamster Ovary cell line, CHO-derived

Human Activin β A
(Gly311 - Ser426)
Accession # NP_002183.1

Human Activin β B
(Gly293 - Ala407)
Accession # NP_002184.2

N-terminus

C-terminus

N-terminal Sequence Analysis Gly311(β A subunit) & Gly293 (β B subunit)

Structure / Form Disulfide-linked heterodimer

Predicted Molecular Mass 12.8 kDa (β A subunit) and 13 kDa (β B subunit)

SPECIFICATIONS

SDS-PAGE 14 kDa, reducing conditions

Activity Measured by its ability to induce hemoglobin expression in K562 human chronic myelogenous leukemia cells. Schwall, R.H. *et al.* (1991) *Method Enzymol.* **198**:340.
The ED₅₀ for this effect is 0.2-1.2 ng/mL.

Endotoxin Level <0.10 EU per 1 μ g of the protein by the LAL method.

Purity >90%, by SDS-PAGE under reducing conditions and visualized by silver stain.

Formulation Lyophilized from a 0.2 μ m filtered solution in Acetonitrile and TFA with BSA as a carrier protein. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution Reconstitute at 50 μ g/mL in sterile PBS containing at least 0.1% human or bovine serum albumin.

Shipping The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.

Stability & Storage Use a manual defrost freezer and avoid repeated freeze-thaw cycles.

- 12 months from date of receipt, -20 to -70 °C as supplied.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

BACKGROUND

Activins, members of the TGF- β superfamily, are disulfide-linked dimeric proteins that were originally purified from gonadal fluids as proteins that stimulated pituitary follicle stimulating hormone (FSH) release. Activin proteins have since been shown to have a wide range of biological activities including: mesoderm induction, neural cell differentiation, bone remodeling, hematopoiesis and roles in reproductive physiology. Activins are produced as precursor proteins with an amino-terminal propeptide that is cleaved to release the carboxy-terminal bioactive ligands. Activins are homodimers or heterodimers of the various β subunit isoforms. Five β subunits (mammalian β _A, β _B, β _C, β _E and *Xenopus* β _D) have been cloned. The nomenclature reflects the subunit composition of the proteins: Activin A (β _A - β _A), Activin B (β _B - β _B), and Activin AB (β _A - β _B). Activin A, Activin B, and Activin AB are present in gonadal tissues and are biologically active proteins. However, little is known about the contribution of the other β subunits to Activin formation and function since knock-outs of β _C and β _E in mice do not exhibit a phenotype.

At the amino acid sequence level, the mature human β _A subunit is 100% identical to mouse β _A, while the mature human and mouse β _B subunits share 98% identity. The mature β _A and β _B subunits share less than 80% amino acid identity. Mice with targeted mutations of β _A, β _B, or both genes do not show mesodermal defects, indicating Activin is not involved in mesoderm formation in mammals as it is in *Xenopus*. Also, the double homozygous mutants have the whole spectrum of defects associated with either mutation alone, suggesting that Activin β _A and β _B do not compensate for one another, nor do they have overlapping functions. Similar to other TGF- β family members, Activins exert their biological activities through binding to the heterodimeric complex composed of two membrane spanning serine-threonine kinases designated type I and type II. Activin binds directly to ACT RII, the complex then associates with ACT RI and initiates signaling through the SMADs.

References:

1. Woodruff, T.K. (1998) *Biochemical Pharmacology* **55**:953.
2. Ying, S.Y. *et al.* (1997) *Proc. Soc. Exp. Biol. Med.* **214**:114.
3. Chang, H. *et al.* (2001) *Mol. Cell. Endocrinology* **180**:39.