

## Activin A Protein, Mouse (HEK293, His)

<b>Cat. No.:</b>	HY-P73241A
<b>Synonyms:</b>	Activin beta-A chain; Activin A; Inhibin beta A chain; INHBA
<b>Species:</b>	Mouse
<b>Source:</b>	HEK293
<b>Accession:</b>	Q3UY39 (S21-S424)
<b>Gene ID:</b>	16323
<b>Molecular Weight:</b>	Approximately 15.98 & 40.76 kDa

### PROPERTIES

<b>AA Sequence</b>	<p>S P T P G S E G H G      S A P D C P S C A L      A T L P K D G P N S      Q P E M V E A V K K</p> <p>H I L N M L H L K K      R P D V T Q P V P K      A A L L N A I R K L      H V G K V G E N G Y</p> <p>V E I E D D I G R R      A E M N E L M E Q T      S E I I T F A E S G      T A R K T L H F E I</p> <p>S K E G S D L S V V      E R A E V W L F L K      V P K A N R T R T K      V T I R L F Q Q Q K</p> <p>H P Q G S L D T G D      E A E E M G L K G E      R S E L L L S E K V      V D A R K S T W H I</p> <p>F P V S S S I Q R L      L D Q G K S S L D V      R I A C E Q C Q E S      G A S L V L L G K K</p> <p>K K K E V D G D G K      K K D G S D G G L E      E E K E Q S H R P F      L M L Q A R Q S E D</p> <p>H P H R R R R R G L      E C D G K V N I C C      K K Q F F V S F K D      I G W N D W I I A P</p> <p>S G Y H A N Y C E G      E C P S H I A G T S      G S S L S F H S T V      I N H Y R M R G H S</p> <p>P F A N L K S C C V      P T K L R P M S M L      Y Y D D G Q N I I K      K D I Q N M I V E E</p> <p>C G C S</p>
<b>Biological Activity</b>	Measured in a cell proliferation assay using HT-29 human colon cancer cell. The ED <sub>50</sub> for this effect is 6.407 ng/mL, corresponding to a specific activity is 1.561×10 <sup>5</sup> units/mg.
<b>Appearance</b>	Lyophilized powder.
<b>Formulation</b>	Lyophilized from a 0.2 μm filtered solution of 20 mM PB, 150 mM NaCl, pH 7.4.
<b>Endotoxin Level</b>	<1 EU/μg, determined by LAL method.
<b>Reconstitution</b>	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH <sub>2</sub> O. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
<b>Storage &amp; Stability</b>	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
<b>Shipping</b>	Room temperature in continental US; may vary elsewhere.

## DESCRIPTION

### Background

Activin is a member of transforming growth factor- $\beta$  (TGF- $\beta$ ) superfamily consisting of two inhibin  $\beta$  subunits linked by disulfide bonds. Activin A is expressed widely in various tissues and cells with strong bioactivities and is the mostly studied activin<sup>[1]</sup>.

The sequence of amino acids in Activin A proteins from different species is very stable, which leads to the conclusion that in the process of evolution, Activin A has been only slightly altered, and that both in humans and in animals, its function is similar.

Activin exists in three basic molecular forms composed of two inhibin  $\beta$  subunits: activin A ( $\beta A\beta A$ ), activin B ( $\beta B\beta B$ ), and activin AB ( $\beta A\beta B$ ). Activin A binds with high affinity to activin type II receptors, which recruit type I receptors and are necessary for the activation of Smad2/3 signaling. The phosphorylated ActRII activates Smad2 and Smad3, which form a complex with Smad4 to translocate to the nucleus. Activin and TGF- $\beta$  share the same signaling pathway at the level of Smad2/3/4. Activin A exerts a variety of biological functions including regulation of hematopoietic cell proliferation, neuron differentiation, pituitary hormone secretion, and tissue repair. It is also involved in the process of many diseases, for example, inflammation, fibrosis and tumorigenesis<sup>[1][2]</sup>.

Activin A has pro- and anti-tumorigenic functions depending on the tumor type. In breast, liver and colon cancers, activin signals were revealed to inhibit tumor cell growth. In addition, tumor tissues were revealed to express decreased levels of activin A or increased levels of activin antagonists or demonstrated the downregulation of activin receptors or Smad proteins. Moreover, its roles include embryonic differentiation, trophoblast invasion of the uterine wall in early pregnancy, and fetal/neonate brain protection in hypoxic conditions. Activin A also regulates bone formation and regeneration, enhances joint inflammation in rheumatoid arthritis, and triggers pathogenic mechanisms in the respiratory system<sup>[1][2]</sup>.

## REFERENCES

[1]. Ge J, et al. Involvement of CHOP in activin A induced myeloma NS 1 cell apoptosis. *Oncol Rep.* 2019;42(6):2644-2654.

[2]. Enrrico Bloise, et al. Activin A in Mammalian Physiology. *Physiol Rev.* 2019 Jan 1;99(1):739-780.

**Caution: Product has not been fully validated for medical applications. For research use only.**

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