

## Activin A Protein, Human/Mouse/Rat (HEK293)

Cat. No.:	HY-P70311
Synonyms:	rHuActivin A; Inhibin beta A chain; INHBA; Activin A
Species:	Rat;Mouse;Human
Source:	HEK293
Accession:	P08476 (G310-S426)
Gene ID:	3624
Molecular Weight:	Approximately 15.0 kDa

### PROPERTIES

AA Sequence	<p>           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 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 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 C G C S         </p>
Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 $\mu$ m filtered solution of PBS, pH 7.4.
Endotoxin Level	<0.01 EU/ $\mu$ g, determined by LAL method.
Reconstitution	It is not recommended to reconstitute to a concentration less than 100 $\mu$ g/mL in ddH <sub>2</sub> O or PBS.
Storage & Stability	Stored at -20°C. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer. It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

### DESCRIPTION

Background	<p>Activin is a member of transforming growth factor-<math>\beta</math> (TGF-<math>\beta</math>) superfamily consisting of two inhibin <math>\beta</math> 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>.</p> <p>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.</p> <p>Activin exists in three basic molecular forms composed of two inhibin <math>\beta</math> subunits: activin A (<math>\beta</math>A<math>\beta</math>A), activin B (<math>\beta</math>B<math>\beta</math>B), and activin AB (<math>\beta</math>A<math>\beta</math>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 ActRI activates Smad2 and Smad3, which form a complex with Smad4 to translocate to the nucleus. Activin and TGF-<math>\beta</math> share the same signaling pathway at the level of</p>
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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>.

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## REFERENCES

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- [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]. Enrico Bloise, et al. Activin A in Mammalian Physiology. *Physiol Rev.* 2019 Jan 1;99(1):739-780.
- [3]. N L Frigon Jr, et al. Regulation of globin gene expression in human K562 cells by recombinant activin A. *Blood.* 1992 Feb 1;79(3):765-72.
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**Caution: Product has not been fully validated for medical applications. For research use only.**

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