ALK-7 Protein, Human (HEK293, Fc)

Cat. No.:	HY-P74417
Synonyms:	Activin receptor type IC; ACTR-IC; ACVRLK7; ALK7
Species:	Human
Source:	HEK293
Accession:	Q8NER5 (L22-E113)
Gene ID:	130399
Molecular Weight:	Approximately 36.6-56 kDa

PROPERTIES

AA Sequence	L S P G L K C V C L L C D S S N F T C Q T E G A C W A S V M L T N G K E Q V I K S C V S L P E L N A Q V F C H S S N N V T K T E C C F T D F C N N I T L H L P T A S P N A P K L G P M E
Biological Activity	Measured by its binding ability in a functional ELISA. When Recombinant Human ALK-7 is immobilized at 2 μg/mL (100 μL/well) can bind Biotinylated Recombinant Human Nodal. The ED_{50} for this effect is 243.4 ng/mL.
Appearance	Lyophilized powder
Formulation	Lyophilized from a 0.2 μm filtered solution of PBS, pH 7.4.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconsititution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH_2O. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
Storage & Stability	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.
Shipping	Room temperature in continental US; may vary elsewhere.

DESCRIPTION

Background	ALK-7, also known as ACVR1C, is a serine/threonine kinase consistent with the characteristics of a type-I receptor. ALK-7 is predominantly expressed in central nervous system. ALK-7 can form complexes with type II receptor serine-threonine kinases for TGF-β and activin in a ligand-dependent manner[1]. The ALK-7 gene encodes a 55-kDa cell-surface protein that exhibits up to 78% amino acid sequence identity in the kinase domain to previously isolated type I receptors for TGF-β and activin. In the extracellular domain, however, ALK-7 is more divergent, displaying comparable similarities with all members of the ALK subfamily. Originally identified and cloned from

rat brain, ALK-7 mRNA is present throughout the digestive and central nervous system of rats. The function of ALK-7 as a type I receptor was confirmed with a constitutively activemutant form that activated a TGF-β/activin response reporter. ALK-7 has also been found to activate some components of the Smad pathway, such as Smad2 and Smad3, in fetal and adult rat pancreas. In the rat pheochromocytoma PC12 cell line, ALK-7 not only activated both Smad2, Smad3, and the MAPK of extracellular signal-regulated kinase and JNK, but it inhibits cell proliferation as well. The human gene for ALK-7 has been mapped to the genetic location of 2q24.1-q3, with most of the mRNA located in the brain, pancreas, and colon. ALK-7 mediates high-ambient glucose-induced cardiomyoblasts apoptosis through the activation of Smad2/3[1][2][3]. ALK-7 combined with specific ligands, such as Nodal, activin B and growth differentiation factor (GDF), can activate Smads and other signaling pathways, thereby regulating cell proliferation, differentiation and apoptosis in various cells. Besides that, ALK-7, along with ALK-5 and ALK-6, participated in renal interstitial fibrosis[1][2][3].

REFERENCES

[1]. M Rydén, et al. A novel type I receptor serine-threonine kinase predominantly expressed in the adult central nervous system. J Biol Chem. 1996 Nov 29;271(48):30603-9.

[2]. Byung-Chul Kim, et al. Activin receptor-like kinase-7 induces apoptosis through activation of MAPKs in a Smad3-dependent mechanism in hepatoma cells. J Biol Chem. 2004 Jul 2;279(27):28458-65.

[3]. Wen-bo Li, et al. Silencing of activin receptor-like kinase 7 alleviates aortic stiffness in type 2 diabetic rats. Acta Diabetol. 2015 Aug;52(4):717-26.

[4]. Kunihiro Tsuchida, et al. Activin isoforms signal through type I receptor serine/threonine kinase ALK7. Mol Cell Endocrinol. 2004 May 31;220(1-2):59-65.

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