

# PRODUCT INFORMATION



## ALK5 Extracellular Domain (human, recombinant)

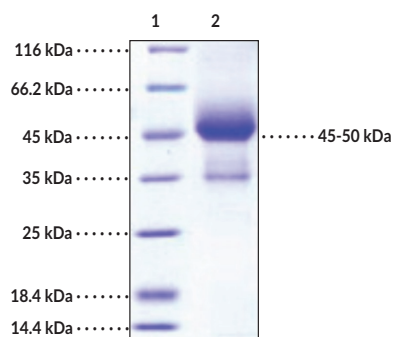
Item No. 31847

### Overview and Properties

<b>Synonyms:</b>	Activin Receptor-like Kinase 5, Serine/threonine Protein Kinase Receptor 4, SKR4, TGF- $\beta$ RI, Transforming Growth Factor $\beta$ Receptor Type I
<b>Source:</b>	Active recombinant C-terminal human IgG1 Fc-His-tagged ALK5 expressed in HEK293 cells
<b>Amino Acids:</b>	34-125
<b>Uniprot No.:</b>	P36897
<b>Molecular Weight:</b>	38.1 kDa
<b>Storage:</b>	-80°C (as supplied)
<b>Stability:</b>	$\geq 1$ year
<b>Purity:</b>	$\geq 85\%$ estimated by SDS-PAGE
<b>Supplied in:</b>	Lyophilized from sterile PBS, pH 7.4
<b>Endotoxin Testing:</b>	$< 1.0$ EU/ $\mu$ g, determined by the LAL endotoxin assay
<b>Bioactivity:</b>	See figures for details

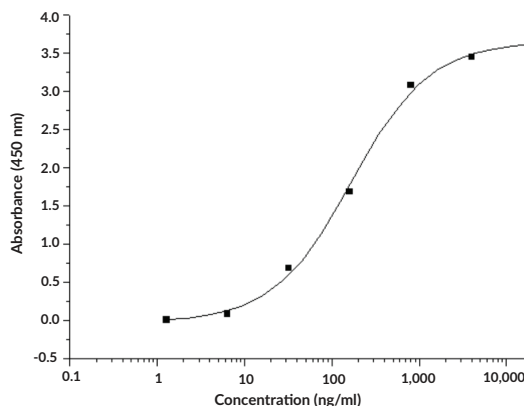
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Images



Lane 1: MW Markers  
Lane 2: ALK5 Extracellular Domain

**SDS-PAGE Analysis of ALK5 Extracellular Domain.** This protein has a calculated molecular weight of 38.1 kDa. It has an apparent molecular weight of approximately 45-50 kDa by SDS-PAGE under reducing conditions due to glycosylation.



**ALK5 Extracellular Domain binding in a binding assay.** Immobilized mouse CD105 at 10  $\mu$ g/ml (100  $\mu$ l/well) can bind human ALK5 Extracellular Domain with a linear range of 6.4-800 ng/ml.

**WARNING**  
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

**SAFETY DATA**  
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

**WARRANTY AND LIMITATION OF REMEDY**  
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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## Description

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Activin receptor-like kinase 5 (ALK5), also known as TGF- $\beta$  receptor type 1 (TGF- $\beta$ RI), is a type I transmembrane glycoprotein, serine/threonine kinase, and member of the TGF- $\beta$  superfamily that is ubiquitously expressed.<sup>1,2</sup> It is composed of an extracellular ligand-binding domain, a single transmembrane domain, an intracellular serine/threonine kinase domain, and a cytoplasmic serine/threonine-rich region.<sup>1</sup> The ALK5 ligand TGF- $\beta$  mediates the formation of a complex that includes ALK5 and the type II transmembrane glycoprotein TGF- $\beta$ RII, which phosphorylates ALK5 to induce intracellular signaling and phosphorylation of SMAD2 and SMAD3 to regulate gene expression.<sup>1,3</sup> The ligands myostatin and growth differentiation factor 11 (GDF-11) induce formation of a complex between ALK5, TGF- $\beta$ RI, activin receptor type 2A (ACTRIIA), and ACTRIIB to activate SMAD signaling in a similar manner. ALK5 signaling has roles in endothelial cell proliferation and migration, as well as angiogenesis.<sup>2,4</sup> Mutations in *TGFBR1* are associated with Loeys-Dietz syndrome, which is a connective tissue disorder characterized by a variety of mild-to-severe vascular defects, including aortic aneurysm.<sup>5</sup> Cayman's ALK5 Extracellular Domain (human, recombinant) protein can be used for binding assays. This protein is a disulfide-linked homodimer. The reduced monomer, composed of ALK5 (amino acids 34-125) fused to His-tagged human IgG1 Fc at its C-terminus, consists of 340 amino acids, has a calculated molecular weight of 38.1 kDa, and a predicted N-terminus of Leu34 after signal peptide cleavage. As a result of glycosylation, the monomer migrates at approximately 45-50 kDa by SDS-PAGE under reducing conditions.

## References

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1. Tsuchida, K., Nakatani, M., Uezumi, A., *et al.* Signal transduction pathway through activin receptors as a therapeutic target of musculoskeletal diseases and cancer. *Endocr. J.* **55(1)**, 11-21 (2008).
2. van Meeteren, L.A., and ten Dijke, P. Regulation of endothelial cell plasticity by TGF- $\beta$ . *Cell Tissue Res.* **347(1)**, 177-186 (2012).
3. Nickel, J., ten Dijke, P., and Mueller, T.D. TGF- $\beta$  family co-receptor function and signaling. *Acta Biochim. Biophys. Sin. (Shanghai)* **50(1)**, 12-36 (2018).
4. Goumans, M.-J., Valdimarsdottir, G., Itoh, S., *et al.* Balancing the activation state of the endothelium via two distinct TGF- $\beta$  type I receptors. *EMBO J.* **21(7)**, 1743-1753 (2002).
5. Gallo, E.M., Loch, D.C., Habashi, J.P., *et al.* Angiotensin II-dependent TGF- $\beta$  signaling contributes to Loeys-Dietz syndrome vascular pathogenesis. *J. Clin. Invest.* **124(1)**, 448-460 (2014).

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