

## 4-1BB/TNFRSF9 Protein, Human (163a.a, HEK293, His)

<b>Cat. No.:</b>	HY-P70678
<b>Synonyms:</b>	CD137; ILA; TNFRSF9; 4-1BB ligand receptor; CDw137; T-cell antigen 4-1BB homolog; T-cell antigen ILA
<b>Species:</b>	Human
<b>Source:</b>	HEK293
<b>Accession:</b>	Q07011 (L24-Q186)
<b>Gene ID:</b>	3604
<b>Molecular Weight:</b>	28-35 kDa

### PROPERTIES

<b>AA Sequence</b>	<pre> L Q D P C S N C P A   G T F C D N N R N Q   I C S P C P P N S F   S S A G G Q R T C D I C R Q C K G V F R   T R K E C S S T S N   A E C D C T P G F H   C L G A G C S M C E Q D C K Q G Q E L T   K K G C K D C C F G   T F N D Q K R G I C   R P W T N C S L D G K S V L V N G T K E   R D V V C G P S P A   D L S P G A S S V T   P P A P A R E P G H S P Q           </pre>
<b>Biological Activity</b>	<p>1. Loaded Human 4-1BB-His on HIS1K Biosensor, can bind Anti-Human CD137 mAb-Fc with an affinity constant of 25.5 nM as determined in BLI assay.</p> <p>2. Immobilized Human 4-1BB-His at 10 µg/mL (100 µl/well) can bind Human 4-1BBL-Fc. The ED<sub>50</sub> of Human IL-23-His is 1.61 µg/mL.</p>
<b>Appearance</b>	Lyophilized powder.
<b>Formulation</b>	Lyophilized from a 0.2 µm filtered solution of PBS, 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

<b>Background</b>	4-1BB, is encoded by TNFRSF9 (CD137, ILA), belongs to tumor necrosis factor (TNF) receptor superfamily. 4-1BB is a surface glycoprotein, expressed in a variety of cells, for example, T cells, B cells, natural killer (NK) cells, dendritic (DCs), eosinophils,
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and mast cells; even a variety of tumor cells such as human leukemia cells. It is widely spread in vascular smooth muscles, tumor vessel walls, and liver tissue of hepatocellular carcinoma. 4-1BB has a preference on CD8+ cells rather than CD4+ cells. It provides co-stimulatory signals and activates cytotoxic effects of CD8+ T cells and helps to form memory T cells. Finally, it promotes the immune system fighting against tumors. Moreover, CD137 binds CD137L to signal monocytes, increase their survival, proliferation and stimulate their migration and extravasation. In addition, it induces the release of various proinflammatory factors, leads to the influx of inflammatory monocytes into tissues and form an inflammatory environment<sup>[1]</sup>. Specifically, CD137 promotes the migration of monocytes/macrophages to tumor microenvironment by upregulating the expression of Fra1. It also promoted the differentiation of monocytes/macrophages into osteoclasts at the same time, thus providing a favorable microenvironment for the colonization and growth of breast cancer cells in bone. It provides a promising therapeutic strategy for metastasis of breast cancer<sup>[2]</sup>. Furthermore, CD137 signaling promotes endothelial cells (ECs) apoptosis through prooxidative and proinflammatory mechanisms, mediated by Nrf2 and NF- $\kappa$ B pathways, respectively<sup>[3]</sup>. The homology of 4-1BB protein in human and mouse was low, and the sequence similarity was 56.75%.

## REFERENCES

- [1]. Ye L, et al. CD137, an attractive candidate for the immunotherapy of lung cancer. *Cancer Sci.* 2020 May;111(5):1461-1467.
- [2]. Jiang P, et al. CD137 promotes bone metastasis of breast cancer by enhancing the migration and osteoclast differentiation of monocytes/macrophages. *Theranostics.* 2019 May 9;9(10):2950-2966.
- [3]. Geng T, et al. CD137 Signaling Promotes Endothelial Apoptosis by Inhibiting Nrf2 Pathway, and Upregulating NF- $\kappa$ B Pathway. *Mediators Inflamm.* 2020 Jun 6;2020:4321912.
- [4]. Langstein J, et al. Comparative analysis of CD137 and LPS effects on monocyte activation, survival, and proliferation. *Biochem Biophys Res Commun.* 2000 Jun 24;273(1):117-22.
- [5]. Langstein J, et al. Identification of CD137 as a potent monocyte survival factor. *J Leukoc Biol.* 1999 Jun;65(6):829-33.
- [6]. Jiang D, et al. CD137 induces proliferation of murine hematopoietic progenitor cells and differentiation to macrophages. *J Immunol.* 2008 Sep 15;181(6):3923-32.
- [7]. Wilcox RA, et al. Provision of antigen and CD137 signaling breaks immunological ignorance, promoting regression of poorly immunogenic tumors. *J Clin Invest.* 2002 Mar;109(5):651-9.

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: [tech@MedChemExpress.com](mailto:tech@MedChemExpress.com)

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA