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# **R**Dsystems

# Recombinant Human 4-1BB/TNFRSF9/CD137

Catalog Number: 9220-4B

## DESCRIPTIO

Chinese Hamster Ovary cell line, CHO-derived human 4-1BB/TNFRSF9/CD137 protein Leu24-His183, with a C-terminal 6-His tag Accession # Q07011
Leu24
18 kDa

SPECIFICATIONS	
SDS-PAGE	25-38 kDa, reducing conditions
Activity	Measured by its binding ability in a functional ELISA. When Recombinant Human 4-1BB/TNFRSF9/CD137 is immobilized at 50 ng/mL, 100 μL/well, the concentration of Recombinant Human 4-1BB Ligand/TNFSF9 (Catalog # 2295-4L) that produces 50% of the optimal binding response is approximately 2.5-12.5 ng/mL.
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
Formulation	Lyophilized from a 0.2 μm filtered solution in PBS. See Certificate of Analysis for details.

PREPARATION AND STORAGE		
Reconstitution	Reconstitute at 500 μg/mL in PBS.	
Shipping	The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.	
Stability & Storage	<ul> <li>Use a manual defrost freezer and avoid repeated freeze-thaw cycles.</li> <li>12 months from date of receipt, -20 to -70 °C as supplied.</li> <li>1 month, 2 to 8 °C under sterile conditions after reconstitution.</li> </ul>	

3 months, -20 to -70 °C under sterile conditions after reconstitution.

#### DATA SEC-MALS Bioactivity Recombinant Human Recombinant Human 4-1BB/TNFRSF9 His-tag Protein 10 4-1BB/TNFRSF9/CD137 0.10 Molar Mass (g/mol) ₀01 ₀10 Protein SEC-MALS. **Bioactivity** When Recombinant 2.5 0.08 Absorbance Human 4-1BB/TNFRSF9 Recombinant Human 4-U 2.0 1.5 1.0 1BB/TNFRSF9 (Catalog # 9220-(Catalog # 9220-4B) is coated at 0.06 4B) has a molecular weight (MW) 50 ng/mL, Recombinant Human 4-0.04 of 21.8 kDa as analyzed by SEC-1BB Ligand/TNFSF9 0.02 P Recombinant Human 4-1BB MALS, suggesting that this Ligand/ TNFSF9 (Catalog # protein is a monomer. MW may 05 0.00 10<sup>3</sup> differ from predicted MW due to Catalog # 2295-4L) binds with a 15 10 20 0.0 post-translational modifications ED<sub>50</sub> of 2.5-15 ng/mL. Time (min) 10-10-1 100 10<sup>1</sup> 10<sup>2</sup> 10<sup>3</sup> . (PTMs) present (i.e. Glycosylation). Recombinant Human 4-1BB Ligand (ng/mL) Retention MW - Prec MW - MAL Polydispe System Su BSA Mono (Monomer) 66.4 ± 3.32 kD

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# **R**DSYSTEMS

# Recombinant Human 4-1BB/TNFRSF9/CD137

Catalog Number: 9220-4B

### BACKGROUND

4-1BB, also known as CD137 and TNFRSF9, is an approximately 30 kDa transmembrane glycoprotein in the TNF receptor superfamily. 4-1BB functions in the development and activation of multiple immune cells (1). Mature human 4-1BB consists of a 163 amino acid (aa) extracellular domain (ECD) with four TNFR cysteine-rich repeats, a 27 aa transmembrane segment, and a 42 aa cytoplasmic domain (2, 3). Within the ECD, human 4-1BB shares 60% aa sequence identity with mouse

and rat 4-1BB. 4-1BB is expressed as a disulfide-linked homodimer on various populations of activated T cell including CD4<sup>+</sup>, CD8<sup>+</sup>, memory CD8<sup>+</sup>, NKT, and regulatory T cells (4-7) as well as on myeloid and mast cell progenitors, dendritic cells, mast cells, and bacterially infected osteoblasts (8-11). It binds with high affinity to the transmembrane 4-1BB Ligand/TNFSF9 which is expressed on antigen presenting cells and myeloid progenitor cells (3, 8). This interaction costimulates the proliferation, activation, and/or survival of the 4-1BB expressing cell (3-7). It can also enhance the activation-induced cell death of repetitively stimulated T cells (3). Mice lacking 4-1BB show augmented T cell activation, perhaps due to its absence on regulatory T cells (12). 4-1BB can associate with OX40 on activated T cells,

forming a complex that responds to either ligand and inhibits Treg and CD8<sup>+</sup> T cell proliferation (13). Reverse signaling through 4-1BB Ligand inhibits the development of dendritic cells, B cells, and osteoclasts (8, 11) but supports mature dendritic cell survival and costimulates the proliferation and activation of mast cells (9, 10).

4-1BB activation enhances CD8<sup>+</sup> T cell and NK cell mediated anti-tumor immunity (14). It also contributes to the development of inflammation in high fat diet-induced metabolic syndrome (15). Soluble forms of 4-1BB and 4-1BB Ligand circulate at elevated levels in the serum of rheumatoid arthritis and hematologic cancer patients, respectively (16, 17).

#### References:

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