ANEWBiosystems®

Product Datasheet

Rev. 25/1/2026

Recombinant Human TNFSF9 (4-1BBL), Animal Component-Free

Cat. No. :	H064H
Alternative Names:	TNFSF9; 4-1BB ligand; 4-1BBL; TNFL9; Tumor necrosis factor ligand superfamily member 9; TNF Superfamily Member 9
Species:	Human
Accession No.:	P41273
Expression System:	HEK293
Protein Sequence:	Arg71-Glu254
Theoretical MW:	19.44 kDa
Theoretical pI:	6.22
Tag:	Tag-Free.
Formulation buffer:	PBS, 5% Mannitol and 0.01% Tween 80, pH7.4.
Appearance:	Lyophilized Powder.
Purity:	≥95% as determined by SDS-PAGE.
Bioactivity:	The activity was determined by its ability to induce IL-8 secretion in peripheral blood mononuclear cells (PBMCs).
Endotoxin Level:	≤0.05 EU/μg, as determined by the LAL assay.
Application:	Cell Culture; Activity Assays.

Preparation & Storage

Reconstitution: Reconstitute with sterile double-distilled water (ddH_2O).

⚠ Centrifuge the vial briefly before opening to ensure full recovery of the solution. Avoid vortexing and minimize vigorous pipetting to maintain protein stability.

❄ Immediately aliquot the reconstituted protein solution and store under recommended conditions. Avoid repeated freeze-thaw cycles.

Shipping: Shipped on dry ice. Short-term transit on cold packs (2-8℃) is acceptable.

Storage: **Use a manual defrost freezer and avoid repeated freeze-thaw cycles.**

- 12 months from date of receipt, -20 to -80℃ as supplied.
- 2-7 days at 2 to 8℃ under sterile conditions after reconstitution.
- 3-6 months at -20 to -80℃ under sterile conditions after reconstitution.

Protein Description

Background: TNFSF9 (tumor necrosis factor superfamily member 9), commonly designated 4-1BB ligand (4-1BBL) or CD137L, is a type II transmembrane glycoprotein critical for adaptive immune regulation. Synthesized as a 254-amino acid precursor, it forms homotrimers on the surface of activated antigen-presenting cells (dendritic cells, macrophages, B cells), endothelial cells, and inflamed tissues; proteolytic cleavage releases a soluble trimeric form. Binding to its receptor 4-1BB (TNFRSF9/CD137) on activated $CD8^+$ T cells, $CD4^+$ T cells, NK cells, and regulatory T cells triggers TRAF1/2-dependent NF-κB and MAPK signaling, enhancing T cell proliferation, survival (via Bcl-xL/Bfl-1 upregulation), IFN-γ/IL-2 production, cytotoxic activity, and memory differentiation. The axis also augments NK cell function and can modulate regulatory T cell activity context-dependently. Physiologically vital for antiviral and antitumor immunity, dysregulation contributes to autoimmune disorders (e.g., rheumatoid arthritis, lupus), graft-versus-host disease, and tumor immune evasion. Clinically, agonistic anti-4-1BB antibodies (urelumab, utomilumab) are under active investigation in oncology—often combined with PD-1/PD-L1 inhibitors—while recombinant 4-1BBL fusion proteins and bispecific engagers targeting TNFSF9 are emerging strategies. Hepatotoxicity with early systemic agonists has spurred development of tumor-localized delivery platforms to improve therapeutic windows.

References:

1. Chalupny NJ, Smith CA, Armitage RJ, et al. Inducible expression of the gp39 homologue 4-1BBL in human T cells. Proc Natl Acad Sci U S A. 1992;89(22):10360-10364.
2. Shuford WW, Klussman K, Tritchler DD, et al. 4-1BB costimulatory signals preferentially induce $CD8^+$ T cell proliferation and lead to the amplification in vivo of cytotoxic T cell responses. J Exp Med. 1997;186(1):47-55.
3. Watts TH. TNF/TNFR family members in costimulation of T cell responses. Annu Rev Immunol. 2005;23:23-68.
4. Chester C, Marabelle A, Houot R, et al. Immunotherapy targeting 4-1BB: mechanistic rationale, clinical results, and future strategies. Blood. 2018;131(1):49-57.

Product Disclaimer

- This product is intended for research use only and is not for use in diagnostic, therapeutic, or clinical procedures.
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