

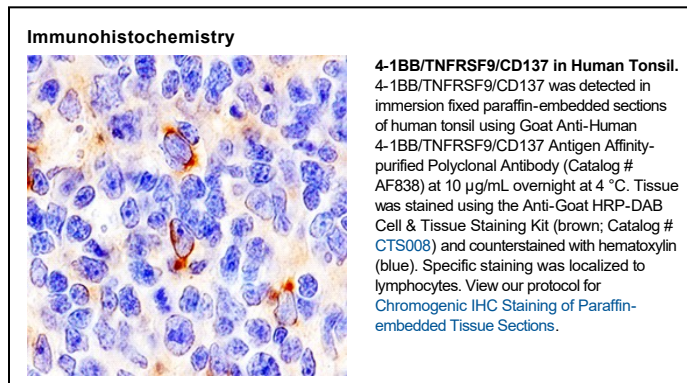
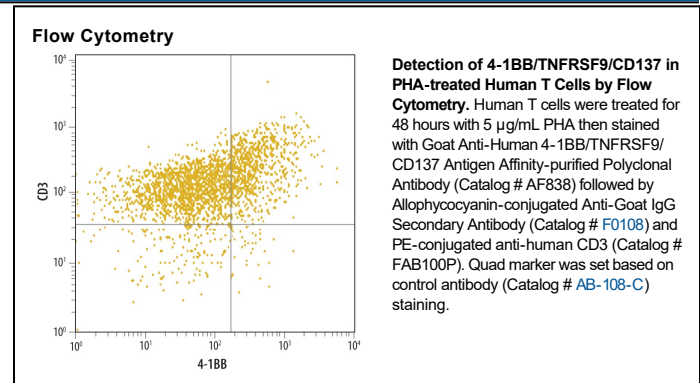
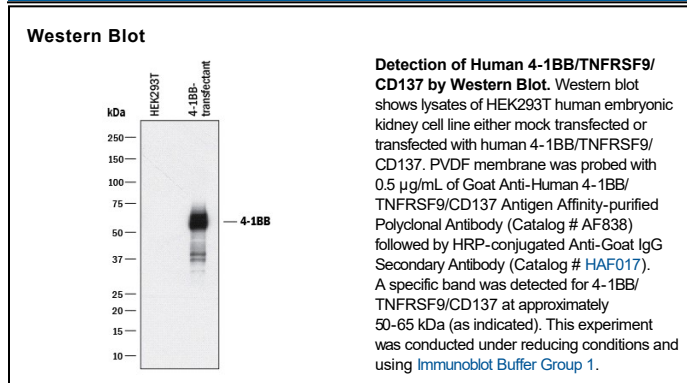
DESCRIPTION	
<b>Species Reactivity</b>	Human
<b>Specificity</b>	Detects 4-1BB/TNFRSF9/CD137 in direct ELISAs and Western blots. In sandwich immunoassays, less than 0.1% cross-reactivity with recombinant mouse (rm) 4-1BB, recombinant human (rh) NGF R, rhTNF RI and rhTNF RII is observed.
<b>Source</b>	Polyclonal Goat IgG
<b>Purification</b>	Antigen Affinity-purified
<b>Immunogen</b>	Mouse myeloma cell line NS0-derived recombinant human 4-1BB/TNFRSF9/CD137 Leu24-Gln186 Accession # Q07011
<b>Endotoxin Level</b>	<0.10 EU per 1 µg of the antibody by the LAL method.
<b>Formulation</b>	Lyophilized from a 0.2 µm filtered solution in PBS with Trehalose. See Certificate of Analysis for details. *Small pack size (-SP) is supplied either lyophilized or as a 0.2 µm filtered solution in PBS.

## APPLICATIONS

**Please Note:** Optimal dilutions should be determined by each laboratory for each application. *General Protocols* are available in the *Technical Information* section on our website.

	Recommended Concentration	Sample
<b>Western Blot</b>	0.5 µg/mL	See Below
<b>Flow Cytometry</b>	0.25 µg/10 <sup>6</sup> cells	See Below
<b>Immunocytochemistry</b>	5-15 µg/mL	Immersion fixed human peripheral blood mononuclear cells
<b>Immunohistochemistry</b>	5-25 µg/mL	See Below
<b>Human 4-1BB/TNFRSF9/CD137 Sandwich Immunoassay</b>		<b>Reagent</b>
<b>ELISA Capture</b>	0.2-0.8 µg/mL	Human 4-1BB/TNFRSF9/CD137 Antibody (Catalog # AF838)
<b>ELISA Detection</b>	0.1-0.4 µg/mL	Human 4-1BB/TNFRSF9/CD137 Biotinylated Antibody (Catalog # BAF838)
<b>Standard</b>		Recombinant Human 4-1BB/TNFRSF9/CD137 Fc Chimera (Catalog # 838-4B)
<b>CyTOF-ready</b>	Ready to be labeled using established conjugation methods. No BSA or other carrier proteins that could interfere with conjugation.	
<b>Agonist Activity</b>	Measured by its ability to co-stimulate IFN-γ secretion by human T cells in the presence of anti-CD3. The ED <sub>50</sub> for this effect is typically 5 - 20 µg/mL.	

## DATA



## PREPARATION AND STORAGE

<b>Reconstitution</b>	Reconstitute at 0.2 mg/mL in sterile PBS.
<b>Shipping</b>	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below. *Small pack size (-SP) is shipped with polar packs. Upon receipt, store it immediately at -20 to -70 °C
<b>Stability &amp; Storage</b>	<b>Use a manual defrost freezer and avoid repeated freeze-thaw cycles.</b> <ul style="list-style-type: none"><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><li>● 6 months, -20 to -70 °C under sterile conditions after reconstitution.</li></ul>

## BACKGROUND

4-1BB is an inducible T cell surface protein belonging to the TNF receptor superfamily. It is alternatively known as TNFRSF9, CD137, and ILA. The 255 amino acid human 4-1BB is a type I transmembrane protein having in its extracellular domain four of the cysteine-rich motifs that are characteristic of the TNF receptor superfamily. The 30 kDa glycoprotein exists both as a monomer and as a dimer on T cells. The human and mouse proteins share 60% amino acid identity. 4-1BB is absent from naive T cells, but it is upregulated and continually expressed following T cell activation. The natural ligand, 4-1BBL, is a member of the TNF superfamily and is expressed on activated antigen presenting cells including dendritic cells, macrophages, and B cells. Cross-linking of 4-1BB by 4-1BBL or by agonistic antibodies transmits a potent co-stimulatory signal that enhances the effect of other activating signals such as PHA or anti-CD3 antibodies. 4-1BB signals through the TFAF2-NIK pathway resulting in activation of NF- $\kappa$ B and ultimately promoting proliferation and survival of T cells.

### References:

1. Vinay, D. and B. Kwon (1998) Semin. Immunol. **10**:481.
2. Sica, G. and L. Chen (2000) Adv. Exp. Med. Biol. **465**:355.