

**DESCRIPTION**

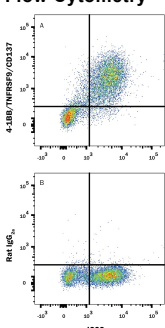
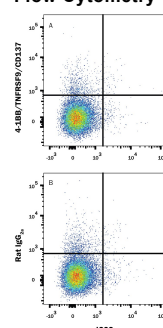
<b>Species Reactivity</b>	Mouse
<b>Specificity</b>	Detects mouse 4-1BB in direct ELISAs and Western blots. Does not cross-react with recombinant human (rh) 4-1BB, rhCD27, recombinant mouse (rm) CD27, rhCD30, rmCD30, rhCD40, rmCD40, rhDR3, rhDR6, rhEDAR, rmEDAR, rhFas, rmFas, rhGITR, rmGITR, rhHVEM, rhLTRβ, rhNGF R, rhOPG, rmOPG, rhRANK, rmRANK, rhTROY, rmTROY, rhTNF sRI, rhTNF sRII, or rmTNF sRII.
<b>Source</b>	Monoclonal Rat IgG <sub>2A</sub> Clone # 158332
<b>Purification</b>	Protein A or G purified from hybridoma culture supernatant
<b>Immunogen</b>	Mouse myeloma cell line NS0-derived recombinant mouse 4-1BB Val24-Leu187 Accession # P20334
<b>Conjugate</b>	Phycoerythrin Excitation Wavelength: 488 nm Emission Wavelength: 565-605 nm
<b>Formulation</b>	Supplied in a saline solution containing BSA and Sodium Azide. See Certificate of Analysis for details.  *Contains <0.1% Sodium Azide, which is not hazardous at this concentration according to GHS classifications. Refer to the Safety Data Sheet (SDS) for additional information and handling instructions.

**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.

	<b>Recommended Concentration</b>	<b>Sample</b>
<b>Flow Cytometry</b>	10 μL/10 <sup>6</sup> cells	See Below

**DATA**

<p><b>Flow Cytometry</b></p>  <p><b>Detection of 4-1BB/TNFRSF9/CD137 in Activated Mouse Splenocytes by Flow Cytometry.</b> Activated mouse splenocytes were stained with Rat Anti-Mouse ICOS APC-conjugated Monoclonal Antibody (Catalog # FAB168A) and either (A) Rat Anti-Mouse 4-1BB/TNFRSF9/CD137 PE-conjugated Monoclonal Antibody (Catalog # FAB937P) or (B) Rat IgG<sub>2A</sub> Phycoerythrin Isotype Control (Catalog # IC006P). View our protocol for <a href="#">Staining Membrane-associated Proteins</a>.</p>	<p><b>Flow Cytometry</b></p>  <p><b>Detection of 4-1BB/TNFRSF9/CD137 in Resting Mouse Splenocytes by Flow Cytometry.</b> Resting mouse splenocytes were stained with Rat Anti-Mouse ICOS APC-conjugated Monoclonal Antibody (Catalog # FAB168A) and either (A) Rat Anti-Mouse 4-1BB/TNFRSF9/CD137 PE-conjugated Monoclonal Antibody (Catalog # FAB937P) or (B) Rat IgG<sub>2A</sub> Phycoerythrin Isotype Control (Catalog # IC006P). View our protocol for <a href="#">Staining Membrane-associated Proteins</a>.</p>
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**PREPARATION AND STORAGE**

<b>Shipping</b>	The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.
<b>Stability &amp; Storage</b>	<b>Protect from light. Do not freeze.</b> <ul style="list-style-type: none"> <li>12 months from date of receipt, 2 to 8 °C as supplied.</li> </ul>

#### BACKGROUND

4-1BB, also known as CD137 and ILA (induced by lymphocyte activation), is a TNF receptor superfamily member and has been designated TNFRSF9. Mouse 4-1BB cDNA encodes a 256 amino acid (aa) residues type I transmembrane protein with a putative 23 aa signal peptide, a 164 aa extracellular domain, a 21 aa transmembrane domain and a 48 aa cytoplasmic region (1-3). A soluble 4-1BB is released from surfaces of cells expressing the transmembrane protein (4). Mouse 4-1BB shares approximately 60% aa sequence identity with its human counterpart. 4-1BB is expressed on activated CD4<sup>+</sup> and CD8<sup>+</sup> T cells, thymocytes, and NK cells. It is also expressed on monocytes, neutrophils, DCs and eosinophils (5). The ligand for 4-1BB (4-1BBL), also named TNFSF9, belongs to the TNF ligand superfamily. 4-1BBL is predominantly expressed on activated antigen presenting cells (APCs) such as B cells, macrophages and dendritic cells (DCs). It is also expressed on most T and B lymphoma cell lines. In response to 4-1BBL binding, 4-1BB transduce a T cell co-stimulatory signal in both CD4<sup>+</sup> and CD8<sup>+</sup> T cells to promote survival and enhance proliferation, cytokine production and effector function. *In vivo*, the co-stimulatory activity of 4-1BB has been shown to be important in graft-v s-host disease and antiviral CTL responses. On dendritic cells, 4-1BB is a DC-activating molecules that enhances cytokine production and upregulates expression of B7-1 and B7-2 costimulatory molecules, resulting in an improved ability to stimulate T cell responses (1-5).

#### References:

1. Goodwin, R.G. *et al.* (1993) *Eur. J. Immunol.* **23**:2631.
2. Alderson, M.R. *et al.* (1994) *Eur. J. Immunol.* **24**:2219.
3. Kwon, B.S. and S.M. Weissman (1989) *Proc. Nat. Acad. Sci. USA* **86**:1963.
4. Wilcox, R.A. *et al.* (2002) *J. Immunol.* **168**:4262.
5. Kwon, B. *et al.* (2002) *TRENDS in Immunology* **23**:378.