

DESCRIPTION

Species Reactivity	Rat
Specificity	Detects rat 4-1BB in direct ELISAs.
Source	Polyclonal Goat IgG
Purification	Antigen Affinity-purified
Immunogen	Mouse myeloma cell line NS0-derived recombinant rat 4-1BB.
Conjugate	Alexa Fluor 594 Excitation Wavelength: 590 nm Emission Wavelength: 617 nm
Formulation	Supplied 0.2mg/ml in 1X PBS with RDF1 and 0.09% Sodium Azide
*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.

CyTOF-ready	Optimal dilution of this antibody should be experimentally determined.
Flow Cytometry	Optimal dilution of this antibody should be experimentally determined.
Immunocytochemistry	Optimal dilution of this antibody should be experimentally determined.

PREPARATION AND STORAGE

Shipping	The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	Protect from light. Do not freeze. 12 months from date of receipt, 2 to 8 °C as supplied

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 rat consists of a 166 amino acid (aa) extracellular domain (ECD) with four TNFR cysteine-rich repeats, a 21 aa transmembrane segment, and a 48 aa cytoplasmic domain. Within the ECD, rat 4-1BB shares 60% and 79% aa sequence identity with human and mouse 4-1BB, respectively. 4-1BB is expressed as a disulfide-linked homodimer on various populations of activated T cells including CD4⁺, CD8⁺, memory CD8⁺, NKT, and regulatory T cells (2-5) as well as on myeloid and mast cell progenitors, dendritic cells, mast cells, and bacterially infected osteoblasts (6-9). It binds with high affinity to the transmembrane 4-1BB Ligand/TNFSF9 which is expressed on antigen presenting cells and myeloid progenitor cells (6, 10). This interaction co-stimulates the proliferation, activation, and/or survival of the 4-1BB expressing cell (2-5, 10). It can also enhance the activation-induced cell death of repetitively stimulated T cells (10). Mice lacking 4-1BB show augmented T cell activation, perhaps due to its absence on regulatory T cells (11). 4-1BB can associate with OX40 on activated T cells, forming a complex that responds to either ligand and inhibits Treg and CD8⁺ T cell proliferation (12). Reverse signaling through 4-1BB Ligand inhibits the development of dendritic cells, B cells, and osteoclasts (6, 9) but supports mature dendritic cell survival and co-stimulates the proliferation and activation of mast cells (7, 8). 4-1BB activation enhances CD8⁺ T cell and NK cell mediated anti-tumor immunity (13). It also contributes to the development of inflammation in high fat diet-induced metabolic syndrome (14). Soluble forms of 4-1BB and 4-1BB Ligand circulate at elevated levels in the serum of rheumatoid arthritis and hematologic cancer patients, respectively (15, 16).

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