

## PB Anti-Human CD29 (integrin $\beta$ 1) Antibody

<b>Catalog Number:</b>	107205, 107206
<b>Size:</b>	25 tests, 100 tests
<b>Target Name:</b>	CD29, Integrin $\beta$ 1 chain, VLA- $\beta$ chain, gpIIa, ITGB1
<b>Regulatory Status:</b>	RUO

### PRODUCT DETAILS

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<b>Clone:</b>	K20
<b>Application:</b>	Flow Cytometry
<b>Reactivity:</b>	Human
<b>Format:</b>	PB
<b>Isotype:</b>	Mouse IgG2a
<b>Antibody Type:</b>	Monoclonal
<b>Formulation:</b>	Phosphate-buffered solution, pH 7.2, containing 0.09% sodium azide and 0.2% (w/v) BSA
<b>Protein Concentration:</b>	Supplied at a lot-specific concentration.
<b>Storage and Handling:</b>	The antibody solution should be stored undiluted between 2°C and 8°C, and protected from prolonged exposure to light. Do not freeze.
<b>Recommended Usage:</b>	For flow cytometric staining, it is recommended to use 5 $\mu$ L of this reagent per 0.5-1.0 million cells in a 100 $\mu$ L volume. Optimal reagent performance should be determined by titration for each specific application. Pacific Blue has an excitation max at 404 nm and an emission max at 455 nm.
<b>Excitation Laser:</b>	Violet laser (405nm)
<b>Isotype Control:</b>	301515

### BACKGROUND INFORMATION

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CD29, also known as integrin  $\beta$ 1 (ITGB1), is a widely expressed cell surface adhesion molecule that plays a fundamental role in cell-cell and cell-extracellular matrix (ECM) interactions. CD29 is expressed on most cell types, including leukocytes, endothelial cells, epithelial cells, fibroblasts, and stem cells, and it partners with multiple integrin  $\alpha$  subunits to form distinct functional receptors. Through these heterodimeric complexes, CD29 regulates cell adhesion, migration, survival, and signaling.

Structurally, CD29 is a type I transmembrane glycoprotein composed of a large extracellular domain, a single transmembrane helix, and a short cytoplasmic tail. The extracellular domain contains multiple conserved motifs, including an I-like domain and metal ion-dependent adhesion sites that are critical for ligand binding and conformational regulation. CD29 pairs with at least twelve different  $\alpha$  integrin subunits (such as  $\alpha$ 1- $\alpha$ 11 and  $\alpha$ v) to form receptors including VLA-4 ( $\alpha$ 4 $\beta$ 1), VLA-5 ( $\alpha$ 5 $\beta$ 1), and VLA-6 ( $\alpha$ 6 $\beta$ 1). The cytoplasmic tail of CD29 lacks intrinsic enzymatic activity but interacts with adaptor proteins such as talin and kindlin, linking integrins to the actin cytoskeleton and enabling bidirectional "inside-out" and "outside-in" signaling. The ligands of CD29-containing

integrins are primarily ECM proteins, including fibronectin, collagen, laminin, and vitronectin, as well as certain cell surface counter-receptors such as VCAM-1. Ligand engagement regulates cell adhesion strength and initiates signaling pathways involving focal adhesion kinase (FAK), PI3K, and MAP kinases, influencing cell proliferation, differentiation, and survival.

CD29 plays important roles in disease. Dysregulated integrin  $\beta$ 1 signaling contributes to cancer progression, invasion, and metastasis by promoting tumor cell adhesion, migration, and resistance to apoptosis. In immune-mediated diseases, CD29-containing integrins regulate leukocyte trafficking and tissue retention, influencing inflammatory responses and autoimmune pathology. CD29 expression has also been associated with fibrosis and abnormal wound healing due to its role in fibroblast activation and ECM remodeling.

Therapeutically, CD29 is relevant both as a target and as a biomarker. Integrin-directed therapies that block specific  $\alpha\beta$ 1 complexes are used or under investigation to modulate immune cell trafficking and tumor-stromal interactions. In immunotherapy, high CD29 expression has been associated with cytotoxic and memory T cell subsets, making it a useful marker for selecting potent T cells in adoptive cell therapies. Additionally, targeting CD29-mediated adhesion pathways is being explored to overcome tumor immune evasion and therapy resistance, underscoring its broad relevance in translational medicine.

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