abcam

ab24693

# Anti-Integrin beta-1/CD29 antibody [P5D2]

Anti-Integrin beta-1/CD29 antibody [P5D2] (ab24693) is a mouse monoclonal antibody detecting Integrin beta 1 in **Flow Cytometry, ICC/IF**. Suitable for **Human**.

- KO validated for confirmed specificity
- Over 90 publications
- Trusted since 2005

KO Validated

## Key facts

| | |
|---|---|
| **Isotype** | IgG1 |
| **Host species** | Mouse |
| **Storage buffer** | pH: 7.4 Preservative: 0.02% Sodium azide Constituents: PBS, 6.97% L-Arginine |
| **Form** | Liquid |
| **Clonality** | Monoclonal |
| **Immunogen** | The exact immunogen used to generate this antibody is proprietary information. |
| **Clone number** | P5D2 |
| **Purification technique** | Affinity purification |
| **Light chain type** | kappa |
| **Concentration** | 1 mg/mL The concentration of this product may be batch-dependent<br>Batch concentration finder → |

## Reactivity data

## Flow Cyt

**Tested**

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|---|---|
| **Species** | Human |
| **Dilution info** | 0.1-1 µg for $10^6$ Cells |
| **Notes** | ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody. |

## ICC/IF

### Tested

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|---|---|
| **Species** | Human |
| **Dilution info** | 1-5 µg/mL |
| **Notes** | - |

## Target data

See full target information Integrin beta-1/CD29

**Function**

Integrins alpha-1/beta-1, alpha-2/beta-1, alpha-10/beta-1 and alpha-11/beta-1 are receptors for collagen. Integrins alpha-1/beta-1 and alpha-2/beta-2 recognize the proline-hydroxylated sequence G-F-P-G-E-R in collagen. Integrins alpha-2/beta-1, alpha-3/beta-1, alpha-4/beta-1, alpha-5/beta-1, alpha-8/beta-1, alpha-10/beta-1, alpha-11/beta-1 and alpha-V/beta-1 are receptors for fibronectin. Alpha-4/beta-1 recognizes one or more domains within the alternatively spliced CS-1 and CS-5 regions of fibronectin. Integrin alpha-5/beta-1 is a receptor for fibrinogen. Integrin alpha-1/beta-1, alpha-2/beta-1, alpha-6/beta-1 and alpha-7/beta-1 are receptors for lamimin. Integrin alpha-6/beta-1 (ITGA6:ITGB1) is present in oocytes and is involved in sperm-egg fusion (By similarity). Integrin alpha-4/beta-1 is a receptor for VCAM1. It recognizes the sequence Q-I-D-S in VCAM1. Integrin alpha-9/beta-1 is a receptor for VCAM1, cytotactin and osteopontin. It recognizes the sequence A-E-I-D-G-I-E-L in cytotactin. Integrin alpha-3/beta-1 is a receptor for epiligrin, thrombospondin and CSPG4. Alpha-3/beta-1 may mediate with LGALS3 the stimulation by CSPG4 of endothelial cells migration. Integrin alpha-V/beta-1 is a receptor for vitronectin. Beta-1 integrins recognize the sequence R-G-D in a wide array of ligands. When associated with alpha-7 integrin, regulates cell adhesion and laminin matrix deposition. Involved in promoting endothelial cell motility and angiogenesis. Involved in osteoblast compaction through the fibronectin fibrillogenesis cell-mediated matrix assembly process and the formation of mineralized bone nodules. May be involved in up-regulation of the activity of kinases such as PKC via binding to KRT1. Together with KRT1 and RACK1, serves as a platform for SRC activation or inactivation. Plays a mechanistic adhesive role during telophase, required for the successful completion of cytokinesis. Integrin alpha-3/beta-1 provides a docking site for FAP (seprase) at invadopodia plasma membranes in a collagen-dependent manner and hence may participate in the adhesion, formation of invadopodia and matrix degradation processes, promoting cell invasion. ITGA4:ITGB1 binds to fractalkine (CX3CL1) and may act as its coreceptor in CX3CR1-dependent fractalkine signaling (PubMed:23125415,

PubMed:24789099). ITGA4:ITGB1 and ITGA5:ITGB1 bind to PLA2G2A via a site (site 2) which is distinct from the classical ligand-binding site (site 1) and this induces integrin conformational changes and enhanced ligand binding to site 1 (PubMed:18635536, PubMed:25398877). ITGA5:ITGB1 acts as a receptor for fibrillin-1 (FBN1) and mediates R-G-D-dependent cell adhesion to FBN1 (PubMed:12807887, PubMed:17158881). ITGA5:ITGB1 acts as a receptor for fibronectin FN1 and mediates R-G-D-dependent cell adhesion to FN1 (PubMed:33962943). ITGA5:ITGB1 is a receptor for IL1B and binding is essential for IL1B signaling (PubMed:29030430). ITGA5:ITGB3 is a receptor for soluble CD40LG and is required for CD40/CD40LG signaling (PubMed:31331973). ITGA5:ITGB1 acts as a receptor for SNED1 and mediates R-G-D-dependent cell adhesion to SNED1 (PubMed:39713860). Plays an important role in myoblast differentiation and fusion during skeletal myogenesis (By similarity). ITGA9:ITGB1 may play a crucial role in SVEP1/polydom-mediated myoblast cell adhesion (By similarity). Integrins ITGA9:ITGB1 and ITGA4:ITGB1 repress PRKCA-mediated L-type voltage-gated channel Ca(2+) influx and ROCK-mediated calcium sensitivity in vascular smooth muscle cells via their interaction with SVEP1, thereby inhibit vasocontraction (PubMed:35802072). Isoform 2. Interferes with isoform 1 resulting in a dominant negative effect on cell adhesion and migration (in vitro). Isoform 5. Isoform 5 displaces isoform 1 in striated muscles. (Microbial infection) Integrin ITGA2:ITGB1 acts as a receptor for Human echoviruses 1 and 8. (Microbial infection) Acts as a receptor for Cytomegalovirus/HHV-5. (Microbial infection) Acts as a receptor for Epstein-Barr virus/HHV-4. (Microbial infection) Integrin ITGA5:ITGB1 acts as a receptor for Human parvovirus B19. (Microbial infection) Integrin ITGA2:ITGB1 acts as a receptor for Human rotavirus. (Microbial infection) Acts as a receptor for Mammalian reovirus. (Microbial infection) In case of HIV-1 infection, integrin ITGA5:ITGB1 binding to extracellular viral Tat protein seems to enhance angiogenesis in Kaposi's sarcoma lesions. (Microbial infection) Interacts with CotH proteins expressed by fungi of the order mucorales, the causative agent of mucormycosis, which plays an important role in epithelial cell invasion by the fungi (PubMed:32487760). Integrin ITGA3:ITGB1 may act as a receptor for R.delemar CotH7 in alveolar epithelial cells, which may be an early step in pulmonary mucormycosis disease progression (PubMed:32487760). (Microbial infection) May serve as a receptor for adhesin A (nadA) of N.meningitidis. (Microbial infection) Facilitates rabies infection in a fibronectin-dependent manner and participates in rabies virus traffic after internalization.

## Storage

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|---|---|
| **Shipped at conditions** | Blue Ice |
| **Appropriate short-term storage conditions** | +4°C |
| **Appropriate long-term storage conditions** | -20°C |
| **Aliquoting information** | Upon delivery aliquot |
| **Storage information** | Avoid freeze / thaw cycle |

## Notes

This monoclonal antibody to integrin beta 1 has been knockout validated in ICC/IF and flow cytometry. The expected signal was observed in wild type cells and no signal was seen in knockout cells.

This antibody inhibits the function of beta 1 integrins and can be used to block cell adhesion (Dittell et al., 1993 and Yokosaki et al., 1994).

**Product Specifications**
Anti-Integrin beta 1 antibody [P5D2] (ab24693) is a mouse monoclonal antibody and is validated for use in Flow Cyt, ICC/IF in human samples.
Anti-Integrin beta 1 antibody [P5D2] (ab24693) specifically detects Integrin beta 1 (UniProt ID: P05556; Molecular weight: 86kDa) and is sold in 100 µg selling sizes.

**Quality and Validation**
Abcam's high quality validation processes ensure Anti-Integrin beta 1 antibody [P5D2] (ab24693) has high sensitivity and specificity.
The specificity of Anti-Integrin beta 1 antibody [P5D2] (ab24693) has been confirmed by testing in knockout samples.
Anti-Integrin beta 1 antibody [P5D2] (ab24693) has been cited over 90 times in peer reviewed journals and is trusted by the scientific community.
Anti-Integrin beta 1 antibody [P5D2] (ab24693) has 4 independent reviews from customers.

**Related Products**
Antibody clone P5D2 is also available pre-conjugated to a variety of labels for your convenience - Alexa Fluor® 488, PE, PerCP, APC (ab193591, ab218273, ab219738, ab221241).

**Want a custom formulation?**
This antibody clone is manufactured by Abcam. If you require a custom buffer formulation or conjugation for your experiments, please contact orders@abcam.com

## Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

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|---|---|
| **Activity summary** | Integrin beta 1 also known as CD29 ITGB1 or integrin β1 is a part of the integrin family of cell surface receptors. This protein plays a role in cell adhesion and signal transduction processes. Integrin beta 1 weighs around 88 kDa and typically expresses on the surface of various cell types including epithelial endothelial and certain blood cells. As a transmembrane receptor it interacts with extracellular matrix components such as fibronectin collagen and laminin facilitating cell-matrix adhesion which is key in maintaining cellular structure and function. |
| **Biological function summary** | Integrin beta 1 functions in cells as a component of heterodimeric complexes with alpha integrin subunits forming adhesion receptors that mediate cellular signaling. These integrins are important for processes like cell migration differentiation proliferation and apoptosis. As they interact with various extracellular ligands integrin beta 1 influences numerous cellular responses particularly in tissue remodeling wound healing and embryonic development. |
| **Pathways** | |

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|---|---|
| | Integrin beta 1 plays significant roles in the MAPK/ERK and PI3K/Akt signaling pathways both of which are essential for cellular growth and survival signals. It forms connections with associated proteins including focal adhesion kinase (FAK) and talin which participate in mechanotransduction and signal propagation. These interactions influence cellular responses to environmental changes impacting processes such as tissue repair and immune response modulation. |
| **Associated diseases and disorders** | Integrin beta 1 associates with cancer progression and fibrosis disorders. Abnormal expression or function of integrin beta 1 can promote tumor invasion and metastasis making it a target for cancer research and potential therapeutic interventions. Furthermore in fibrosis integrin beta 1 interacts with transforming growth factor-beta (TGF-β) signaling contributing to excessive extracellular matrix production and scarring. Understanding these relationships helps in developing targeted treatments for conditions where integrin beta 1 plays a critical role. |

## Product promise

**Tested**

We have tested this species and application combination and it works. It is covered by our product promise.

**Expected**

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

**Predicted**

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

**Not recommended**

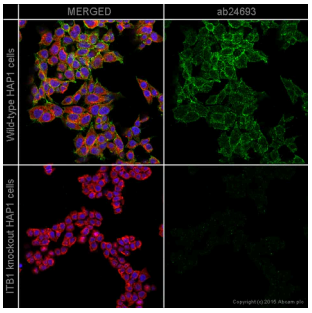
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

## 6 product images

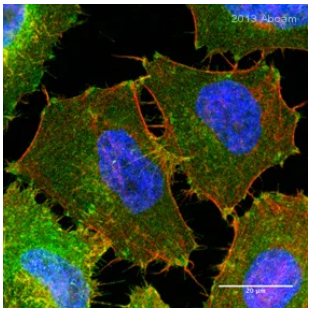



## Immunocytochemistry/ Immunofluorescence - Anti-Integrin beta-1/CD29 antibody [P5D2] (ab24693)

Integrin beta-1/CD29 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-Integrin beta-1/CD29 antibody

ab24693 staining Integrin beta 1 in wild-type HAP1 cells (top panel) and Integrin beta 1 knockout HAP1 cells (bottom panel). The cells were fixed with 4% formaldehyde (10min), permeabilized with 0.1% Triton X-100 for 5 minutes and then blocked with 1% BSA/10% normal goat serum/0.3M glycine in 0.1% PBS-Tween for 1h. The cells were then incubated with ab24693 at 5µg/ml concentration and ab202272 at 1/250 dilution (shown in pseudo colour red) overnight at +4°C, followed by a further incubation at room temperature for 1h with a goat secondary antibody to Mouse IgG (Alexa Fluor® 488) (ab150117) at 2 µg/ml (shown in green). Nuclear DNA was labelled in blue with DAPI.

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This image is courtesy of an anonymous customer review.

## Immunocytochemistry/ Immunofluorescence - Anti-Integrin beta-1/CD29 antibody [P5D2] (ab24693)

Integrin beta-1/CD29 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-Integrin beta-1/CD29 antibody

ICC/IF image of ab24693 stained HeLa cells. The cells were formaldehyde fixed, permeabilization with 0.5% TritonX/PBS and then blockedwith 5% BSA for 30 minutes at 21°C. The cells were then incubated with the antibody (ab24693, 1/200) for 1 hour at 21°C. The secondary antibody (green) was Alexa Fluor® 488 goat anti-mouse IgG (H+L) used at a 1/500 dilution. DAPI was used to stain the cell nuclei (blue) and Phalloidin-TRITC (red) the actin cytoskeleton.

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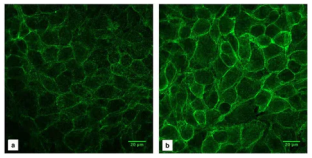


Image from Molladavoodi S et al., PLoS One. 2017;12(6):e0178981. Fig 8.; doi: 10.1371/journal.pone.0178981. Reproduced under the Creative Commons license http://creativecommons.org/licenses/by/4.0/

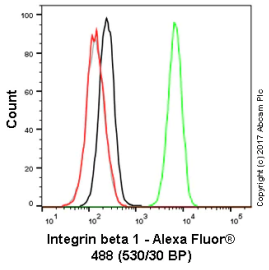
## Immunocytochemistry/ Immunofluorescence - Anti-Integrin beta-1/CD29 antibody [P5D2] (ab24693)

Integrin beta-1/CD29 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-Integrin beta-1/CD29 antibody

Higher intensity for integrin $\beta_1$ staining can be observed in the low shear sample compared to no shear.
a) Control (no shear) sample, b) After 24 hours of low shear stress exposure.

Control cells and cells exposed to low shear for 24-hr were fixed with 4% paraformaldehyde. Samples were permeabilized with 0.1% Triton and nonspecific binding was blocked with 1% BSA/10% goat serum. Samples were incubated with ab24693 followed by Alexa Fluor® 488 conjugated secondary antibody (ab150113).

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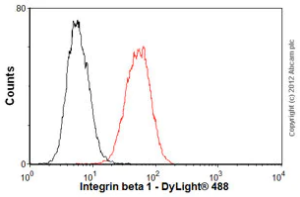



## Flow Cytometry - Anti-Integrin beta-1/CD29 antibody [P5D2] (ab24693)

Integrin beta-1/CD29 Flow Cytometry staining using mouse Anti-Integrin beta-1/CD29 antibody

Overlay histogram showing HAP1 wildtype (green line) and HAP1-ITGB1 knockout cells (red line) stained with ab24693. Live HAP1 wildtype and HAP1-ITGB1 knockout cells were incubated in 1x PBS / 10% normal goat serum to block non-specific protein-protein interactions followed by the antibody (ab24693, 0.1µg/0.5x$10^6$ cells) for 30 min at 22°C. A mouse IgG1 isotype control antibody (ab170190) was used at the same concentration and conditions as the primary antibody (HAP1

wildtype - black line, HAP1-ITGB1 knockout - grey line). Unlabelled sample was also used as a control (this line is not shown for the purpose of simplicity). Acquisition of >5,000 events were collected using a 50 mW Blue laser (488nm) and 530/30 bandpass filter.




## Flow Cytometry - Anti-Integrin beta-1/CD29 antibody [P5D2] (ab24693)

Integrin beta-1/CD29 Flow Cytometry staining using mouse Anti-Integrin beta-1/CD29 antibody

Overlay histogram showing MCF7 cells stained with ab24693 (red line). The cells were fixed with 4% paraformaldehyde (10 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab24693, 1µg/1x$10^6$ cells) for 30 min at 22°C. The secondary antibody used was a goat anti-mouse DyLight® 488 (IgG; H+L) (ab96879) at 1/500 dilution for 30 min at 22°C. Isotype control antibody (black line) was mouse IgG1 [ICIGG1] (ab91353, 2µg/1x$10^6$ cells) used under the same conditions. Acquisition of >5,000 events was performed. This antibody gave a positive signal in MCF7 cells fixed with 80% methanol (5 min)/permeabilized with 0.1% PBS-Tween for 20 min used under the same conditions.

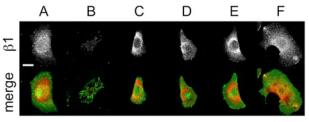



Image from Modulevsky DJ et al., PLoS One. 2012;7(9):e45329. Fig 7.; doi: 10.1371/journal.pone.0045329. Reproduced under the Creative Commons license http://creativecommons.org/licenses/by/4.0/

## Immunocytochemistry/ Immunofluorescence - Anti-Integrin beta-1/CD29 antibody [P5D2] (ab24693)

Integrin beta-1/CD29 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-Integrin beta-1/CD29 antibody

Cells were exposed to inhibitors for 60 min and then fixed and stained for the presence of β1-integrin (greyscale and red in the merge) and the plasma membrane (green in the merge). LSCM images were acquired at the cell-substrate interface. (A) Control (scale bar=20 µm and applies to all), (B) Cyt-D, (C) nocodazole, (D) Y-27632A, (E) ML-7 and (F) blebbistatin treated cells. In all cases, integrin-ß1 is well distributed over the cell contact area. However, after 60 min of CytD treatment a significant decrease in integrin-ß1 was observed, correlating to a significant decrease in cell adhesion strength (Fig. 5).
Cells were first fixed by parafromaldehyde and subsequently extracted by methanol. ab24693 and Alexa Fluor® 546 rabbit anti-mouse immunoglobin were used as primary and secondary antibodies, respectively. Cells were also stained with wheat germ agglutinin coupled to Oregon Green 488 to reveal the cell membrane.

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.