The monoclonal antibody BV7 recognizes human β1-integrin. Beta-1 integrin is a ubiquitously expressed ~89 kDa type I transmembrane protein functioning as receptor when heterodimerized with one alpha subunit. It belongs to the integrin beta chain family consisting of four different genes, encoding multiple β-integrins via alternative splicing. Ligand-recognition depends on the composition of the heterodimer: either collagen, fibronectin, VCAM1, laminin, cytotactin, osteopontin, epiligrin, thrombospondin and CSPG4 can bind to the integrin-complex. Beta-1 integrins recognize the sequence R-G-D in a wide array of ligands. Isoform beta-1B interferes with isoform beta-1A resulting in a dominant negative effect on cell adhesion and migration (in vitro). In case of HIV-1 infection, the interaction with extracellular viral Tat protein seems to enhance angiogenesis in Kaposi's sarcoma lesions. When associated with α7, β1-integrin regulates cell adhesion and laminin matrix deposition. BV7 is active on HT-29 colon carcinoma cells and on HCCP-2998 tumor cells. It is involved in promoting endothelial cell motility and angiogenesis. Furthermore, β1-integrin plays a mechanistic adhesive role during telophase, and is required for the successful completion of cytokinesis. Upon activation integrins in general, including β1-integrin, are known to exhibit global structural rearrangements and exposure of ligand binding sites. β1-integrin modulation is of importance in tissue repair and regeneration. In cultured primary hippocampal neurons, astrocytes and tissues, cell surface expression of amyloid beta fibrils (key hallmark of Alzheimer’s disease) selectively co-localized with β1-integrin. Preincubation of cells with antibodies against β1-integrin, as well as α1-integrin, greatly enhanced amyloid beta-induced apoptosis, indicating a protective role for integrins in apoptosis. The monoclonal antibody BV7 is active on HT-29 colon carcinoma cells and on HCCP-2998 tumor cells. BV7 binds to several other tumor cells (MG3 osteosarcoma, A375 melanoma, MHCC-1410 and Lovo colon carcinoma) but does not affect adhesion to endothelial cells.

**Applications**

- FC: Antibody BV7 stains the extracellular domain of beta-1 integrin. HUVEC cells were fixed in 4% paraformaldehyde before staining. Mouse IgG1 isotype was used as negative.
- FS: Antibody BV7 functions as an inhibiting antibody. The antibody was functionally tested by adhesion assay (ref 1), chemotaxis (ref 2), patch clamp analysis (ref 3) and neurotoxicity induced apoptosis (ref 4).

**Application FC** has been tested by Hycult Biotech. Application W is based on personal communication.

**Application notes**

**Catalog no**

HM2033 (lot number and expiry date are indicated on the label)

**Description**

The monoclonal antibody BV7 recognizes human β1-integrin. Beta-1 integrin is a ubiquitously expressed ~89 kDa type I transmembrane protein functioning as receptor when heterodimerized with one alpha subunit. It belongs to the integrin beta chain family consisting of four different genes, encoding multiple β-integrins via alternative splicing. Ligand-recognition depends on the composition of the heterodimer: either collagen, fibronectin, VCAM1, laminin, cytotactin, osteopontin, epiligrin, thrombospondin and CSPG4 can bind to the integrin-complex. Beta-1 integrins recognize the sequence R-G-D in a wide array of ligands. Isoform beta-1B interferes with isoform beta-1A resulting in a dominant negative effect on cell adhesion and migration (in vitro). In case of HIV-1 infection, the interaction with extracellular viral Tat protein seems to enhance angiogenesis in Kaposi's sarcoma lesions. When associated with α7, β1-integrin regulates cell adhesion and laminin matrix deposition. BV7 is active on HT-29 colon carcinoma cells and on HCCP-2998 tumor cells. It is involved in promoting endothelial cell motility and angiogenesis. Furthermore, β1-integrin plays a mechanistic adhesive role during telophase, and is required for the successful completion of cytokinesis. Upon activation integrins in general, including β1-integrin, are known to exhibit global structural rearrangements and exposure of ligand binding sites. β1-integrin modulation is of importance in tissue repair and regeneration. In cultured primary hippocampal neurons, astrocytes and tissues, cell surface expression of amyloid beta fibrils (key hallmark of Alzheimer’s disease) selectively co-localized with β1-integrin. Preincubation of cells with antibodies against β1-integrin, as well as α1-integrin, greatly enhanced amyloid beta-induced apoptosis, indicating a protective role for integrins in apoptosis. The monoclonal antibody BV7 is active on HT-29 colon carcinoma cells and on HCCP-2998 tumor cells. BV7 binds to several other tumor cells (MG3 osteosarcoma, A375 melanoma, MHCC-1410 and Lovo colon carcinoma) but does not affect adhesion to endothelial cells.

**Application**

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N.D. = Not Determined; F = Frozen sections; FC = Flow Cytometry; FS = Functional Studies; IA = Immuno Assays; IF = Immuno Fluorescence; IP = Immuno Precipitation; P = Paraﬁn sections; W = Western blot

Application FC has been tested by Hycult Biotech. Application W is based on personal communication.

**Application notes**

FC: Antibody BV7 stains the extracellular domain of beta-1 integrin. HUVEC cells were fixed in 4% paraformaldehyde before staining. Mouse IgG1 isotype was used as negative.

FS: Antibody BV7 functions as an inhibiting antibody. The antibody was functionally tested by adhesion assay (ref 1), chemotaxis (ref 2), patch clamp analysis (ref 3) and neurotoxicity induced apoptosis (ref 4).
Beta-1 integrin expression on HUVEC cells. Flow cytometric detection of human β1-integrin on HUVECs (mAb BV7; Cat# HM2033). Controls and anti-human β1-integrin at 0.4 µg/100000 cells (1 hr 4 °C).

References

Use
For flow cytometry, dilutions to be used depend on detection system applied. It is recommended that users test the reagent and determine their own optimal dilutions. The typical starting working dilution is 1:50. For functional studies, in vitro dilutions have to be optimized in user’s experimental setting.

Positive control
HT-29 colon carcinoma, Endothelial cells

Storage and stability
Product should be stored at 4°C. Under recommended storage conditions, product is stable for at least one year. The exact expiry date is indicated on the label.

Precautions
For research use only. Not for use in or on humans or animals or for diagnostics. It is the responsibility of the user to comply with all local/state and federal rules in the use of this product. Hycult Biotech is not responsible for any patent infringements that might result from the use or derivation of this product.

Also available
HM2033F  FITC-conjugated monoclonal antibody against Human β1-Integrin, clone BV7
HM2032  Monoclonal antibody against Human VE-cadherin, clone BV9
HM2034  Monoclonal antibody against Human α5β3 integrin, clone BV3
HM2035  Monoclonal antibody against Human β3 integrin, clone BV4
HM2036  Monoclonal antibody against Human Vitronectin, clone BV1

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