

## Datasheet: MCA709SBV440

**BATCH NUMBER 100004785**

|                      |   |
|----------------------|---|
| <b>Description:</b>  | RAT ANTI HUMAN CD28:StarBright Violet 440 |
| <b>Specificity:</b>  | CD28                                      |
| <b>Format:</b>       | StarBright Violet 440                     |
| <b>Product Type:</b> | Monoclonal Antibody                       |
| <b>Clone:</b>        | YTH913.12                                 |
| <b>Isotype:</b>      | IgG2b                                     |
| <b>Quantity:</b>     | 100 TESTS/0.5ml                           |

### Product Details

#### Applications

This product has been reported to work in the following applications. This information is derived from testing within our laboratories, peer-reviewed publications or personal communications from the originators. Please refer to references indicated for further information. For general protocol recommendations, please visit [www.bio-rad-antibodies.com/protocols](http://www.bio-rad-antibodies.com/protocols).

|                | Yes | No | Not Determined | Suggested Dilution |
|----------------|-----|----|----------------|--------------------|
| Flow Cytometry | ▪   |    |                | Neat               |

Where this product has not been tested for use in a particular technique this does not necessarily exclude its use in such procedures. Suggested working dilutions are given as a guide only. It is recommended that the user titrates the product for use in their own system using appropriate negative/positive controls.

|                        |   |                            |                          |
|------------------------|---|----------------------------|--------------------------|
| <b>Target Species</b>  | Human   |                            |                          |
| <b>Product Form</b>    | Purified IgG conjugated to StarBright Violet 440 - liquid                                     |                            |                          |
| <b>Max Ex/Em</b>       | <b>Fluorophore</b>  | <b>Excitation Max (nm)</b> | <b>Emission Max (nm)</b> |
|                        | StarBright Violet 440   | 385                        | 438                      |
| <b>Preparation</b>     | Purified IgG prepared by affinity chromatography on Protein G from tissue culture supernatant |                            |                          |
| <b>Buffer Solution</b> | Phosphate buffered saline   |                            |                          |
| <b>Preservative</b>    | 0.09% Sodium Azide (NaN <sub>3</sub> )  |                            |                          |
| <b>Stabilisers</b>     | 1% Bovine Serum Albumin   |                            |                          |
|                        | 0.1% Pluronic F68   |                            |                          |
|                        | 0.1% PEG 3350   |                            |                          |

**Immunogen** Human peripheral blood T-cells

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**External Database Links**

**UniProt:**

[P10747](#) [Related reagents](#)

**Entrez Gene:**

[940](#) CD28 [Related reagents](#)

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**Fusion Partners**

Spleen cells from an immunised DA rat were fused with cells of the Y3/Ag 1.2.3 rat myeloma cell line

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**Specificity**

**Rat anti Human CD28 antibody, clone YTH913.12** recognizes human CD28, a ~44 kDa single pass type 1 trans-membrane protein expressed as a homodimer on a major subset of human T-cells ([Thompson \*et al.\* 1989](#)), responsible for activation of these cells via interaction with the TCR. CD28 is involved in the tuning of the T-cell for activation via TCR, lowering the threshold for activation from around 8000 triggered TCRs to approximately 1500 ([Viola \*et al.\* 1996](#)).

CD28 along with CD152, also known as CTLA-4 acts as a co-receptor for the co-stimulatory molecules CD80 and CD86 ([Azuma \*et al.\* 1993](#)). CD28 offers a positive stimulatory role on ligation of CD80 and CD86 while CTLA-4 offers a negative feedback signal preventing CD28 mediated T-cell activation of CD86 ([Krummel \*et al.\* 1995](#)).

Rat anti human CD28, clone YTH913.12 has been reported to recognize an epitope of CD28 expressed by NK cells, which is not recognized by other anti human CD28 clones such as 9.3 and CD28.2 ([Galea-Lauri \*et al.\* 1999](#).) Other reports however have failed to demonstrate CD28 staining on peripheral blood derived NK cells using clone YTH913.12 ([Wilson \*et al.\* 1999](#)).

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**Flow Cytometry**

Use 5ul of the suggested working dilution to label  $10^6$  cells in 100ul. Best practices suggest a 5 minutes centrifugation at 6,000g prior to sample application.

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**References**

1. Reiter, C. (1989) Cluster Report: CD28 in Leucocyte Typing IV: White Cell Differentiation Antigens. Edited by Knapp, W., Dorken, B., Gilks, W.R., Rieber, E.P., Schmidt, R.E., Stein, H. and von dem Borne, A.E.G.Kr. Oxford University Press. pp 352-3.
2. Galea-Lauri, J. *et al.* (1999) Expression of a variant of CD28 on a subpopulation of human NK cells: implications for B7-mediated stimulation of NK cells. [J Immunol. 163 \(1\): 62-70.](#)
3. Gabdoulkhakova, A. *et al.* (2007) High rate of mutation reporter gene inactivation during human T cell proliferation. [Immunogenetics. 59: 135-43.](#)
4. Pridgeon, C. *et al.* (2011) Regulation of IL-17 in chronic inflammation in the human lung. [Clin Sci \(Lond\). 120: 515-24.](#)
5. Blanco, B. *et al.* (2003) Induction of human T lymphocyte cytotoxicity and inhibition of tumor growth by tumor-specific diabody-based molecules secreted from gene-modified bystander cells. [J Immunol. 171: 1070-7.](#)
6. Costa, C. *et al.* (2002) Human NK cell-mediated cytotoxicity triggered by CD86 and Gal alpha 1,3-Gal is inhibited in genetically modified porcine cells. [J Immunol. 168: 3808-16.](#)

7. Litjens, N.H. *et al.* (2011) Identification of Circulating Human Antigen-Reactive CD4+FOXP3+ Natural Regulatory T Cells. [J Immunol. 188: 1083-90.](#)
8. Goodier, M.R. and Londei, M. (2004) CD28 is not directly involved in the response of human CD3- CD56+ natural killer cells to lipopolysaccharide: a role for T cells. [Immunology. 111: 384-90.](#)
9. Wilson, J.L. *et al.* (1999) NK cell triggering by the human costimulatory molecules CD80 and CD86. [J Immunol. 163: 4207-12.](#)
10. Kropf, P. *et al.* (2007) Arginase activity mediates reversible T cell hyporesponsiveness in human pregnancy. [Eur J Immunol. 37: 935-45.](#)
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12. McLeod, J.D. *et al.* (1998) Activation of human T cells with superantigen (staphylococcal enterotoxin B) and CD28 confers resistance to apoptosis via CD95. [J Immunol. 160: 2072-9.](#)
13. Svensson-Arvelund, J. *et al.* (2015) The human fetal placenta promotes tolerance against the semiallogeneic fetus by inducing regulatory T cells and homeostatic M2 macrophages. [J Immunol. 194 \(4\): 1534-44.](#)
14. Hasib, L. *et al.* (2016) Functional and homeostatic defects of regulatory T cells in patients with coronary artery disease. [J Intern Med. 279 \(1\): 63-77.](#)
15. Siska, E.K. *et al.* (2017) Generation of an immortalized mesenchymal stem cell line producing a secreted biosensor protein for glucose monitoring. [PLoS One. 12 \(9\): e0185498.](#)

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| <b>Storage</b>                       | Store at +4°C. DO NOT FREEZE.<br>This product should be stored undiluted.   |
| <b>Guarantee</b>                     | 12 months from date of despatch   |
| <b>Acknowledgements</b>              | This product is covered by U.S. Patent No. 10,150,841 and related U.S. and foreign counterparts   |
| <b>Health And Safety Information</b> | Material Safety Datasheet documentation #20438 available at: <a href="https://www.bio-rad-antibodies.com/SDS/MCA709SBV440">https://www.bio-rad-antibodies.com/SDS/MCA709SBV440</a><br>20438 |
| <b>Regulatory</b>                    | For research purposes only  |

## Related Products

### Recommended Useful Reagents

[HUMAN SEROBLOCK \(BUF070A\)](#)

[HUMAN SEROBLOCK \(BUF070B\)](#)

**North & South** Tel: +1 800 265 7376

**America** Fax: +1 919 878 3751

Email: [antibody\\_sales\\_us@bio-rad.com](mailto:antibody_sales_us@bio-rad.com)

**Worldwide**

Tel: +44 (0)1865 852 700

Fax: +44 (0)1865 852 739

Email: [antibody\\_sales\\_uk@bio-rad.com](mailto:antibody_sales_uk@bio-rad.com)

**Europe**

Tel: +49 (0) 89 8090 95 21

Fax: +49 (0) 89 8090 95 50

Email: [antibody\\_sales\\_de@bio-rad.com](mailto:antibody_sales_de@bio-rad.com)

To find a batch/lot specific datasheet for this product, please use our online search tool at: [bio-rad-antibodies.com/datasheets](https://www.bio-rad-antibodies.com/datasheets)

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