

Datasheet: MCA2365GA

Description:	MOUSE ANTI BOVINE CD335
Specificity:	CD335
Other names:	NKp46
Format:	Purified
Product Type:	Monoclonal Antibody
Clone:	AKS1
Isotype:	IgG1
Quantity:	0.1 mg

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.

	Yes	No	Not Determined	Suggested Dilution
Flow Cytometry	▪			1/50 - 1/200
Immunohistology - Frozen			▪	
Immunohistology - Paraffin			▪	
ELISA			▪	
Immunoprecipitation			▪	
Western Blotting	▪			
Immunofluorescence	▪			

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.

Target Species	Bovine
Species Cross Reactivity	<p>Reacts with: American Bison</p> <p>N.B. Antibody reactivity and working conditions may vary between species. Cross reactivity is derived from testing within our laboratories, peer-reviewed publications or personal communications from the originators. Please refer to references indicated for further information.</p>
Product Form	Purified IgG - liquid
Preparation	Purified IgG prepared by affinity chromatography on Protein G from tissue culture

supernatant

Buffer Solution Phosphate buffered saline

Preservative Stabilisers 0.09% sodium azide (NaN₃)

Carrier Free Yes

Approx. Protein Concentrations IgG concentration 1.0 mg/ml

Immunogen Fusion protein consisting of the extracellular region of bovine CD335.

External Database Links

UniProt:

[Q863H2](#)

[Related reagents](#)

Entrez Gene:

[369024](#)

NCR1

[Related reagents](#)

Fusion Partners Spleen cells from immunised Balb/c mice were fused with cells of the NS-0 myeloma cell line.

Specificity **Mouse anti Bovine CD335 antibody, clone AKS1** recognizes bovine CD335, also known as NKp46 and Natural cytotoxicity triggering receptor 1. CD335 is a type I transmembrane protein, with two extracellular C2-type immunoglobulin-like domains, which functions as an activating receptor. CD335 is expressed by human natural killer cells ([Sivori *et al.* 1997](#)). The bovine homologue is expressed on bovine NK cells ([Storset *et al.* 2004](#)) and no expression of CD335 has been detected on B cells, T cells, monocytes or granulocytes.

Clone AKS1 is reported to activate lysis of FcγR-expressing cell line P815, by IL-2 activated NKp46+ cells ([Storset *et al.* 2004](#)).

Flow Cytometry Use 10µl of the suggested working dilution to label 10⁶ cells in 100µl

References

1. Storset, A.K. *et al.* (2004) NKp46 defines a subset of bovine leukocytes with natural killer cell characteristics. [Eur J Immunol. 34 \(3\): 669-76.](#)
2. Kulberg, S. *et al.* (2004) Reference values for relative numbers of natural killer cells in cattle blood. [Dev Comp Immunol. 28 \(9\): 941-8.](#)
3. Van Rhijn, I. *et al.* (2007) Massive, sustained γδ T cell migration from the bovine skin *in vivo*. [J Leukoc Biol. 81: 968-73.](#)
4. Toka, F.N. *et al.* (2011) Rapid and Transient Activation of γδ T Cells to IFN-γ Production, NK Cell-Like Killing, and Antigen Processing during Acute Virus Infection. [J Immunol. 186: 4853-61.](#)
5. Bastos, R.G. *et al.* (2008) Bovine NK cells acquire cytotoxic activity and produce IFN-γ after stimulation by *Mycobacterium bovis* BCG- or *Babesia bovis*-exposed splenic dendritic cells. [Vet Immunol Immunopathol. 124: 302-12.](#)
6. Boysen P *et al.* (2006) Bovine CD2-/NKp46+ cells are fully functional natural killer cells

- with a high activation status. [BMC Immunol. 7: 10.](#)
7. Elh mouzi-Younes, J. *et al.* (2009) Bovine neonate natural killer cells are fully functional and highly responsive to interleukin-15 and to NKp46 receptor stimulation. [Vet Res. 40: 54.](#)
 8. Elh mouzi-Younes, J. *et al.* (2010) Ovine CD16+/CD14- blood lymphocytes present all the major characteristics of natural killer cells. [Vet Res. 41:4.](#)
 9. Hoek, A. *et al.* (2009) Subpopulations of bovine WC1(+) γ/δ T cells rather than CD4(+)CD25(high) Foxp3(+) T cells act as immune regulatory cells *ex vivo*. [Vet Res. 40:6.](#)
 10. Zuerner, R.L. *et al.* (2011) A *Leptospira borgpetersenii* Serovar Hardjo Vaccine Induces a Th1 Response, Activates NK Cells, and Reduces Renal Colonization. [Clin Vaccine Immunol. 18: 684-91.](#)
 11. Nelson, D.D. *et al.* (2010) CD8(+)/perforin(+)/WC1(-) γ/δ T cells, not CD8(+) α/β T cells, infiltrate vasculitis lesions of American bison (*Bison bison*) with experimental sheep-associated malignant catarrhal fever. [Vet Immunol Immunopathol. 136: 284-91.](#)
 12. Banos, G. *et al.* (2013) Identification of immune traits correlated with dairy cow health, reproduction and productivity. [PLoS One. 8: e65766.](#)
 13. Ramstead, A.G. *et al.* (2015) Aging influences the response of T cells to stimulation by the ellagitannin, oenothein B. [Int Immunopharmacol. 26 \(2\): 367-77.](#)
 14. Boysen, P. *et al.* (2008) Natural killer cells in lymph nodes of healthy calves express CD16 and show both cytotoxic and cytokine-producing properties. [Dev Comp Immunol. 32 \(7\): 773-83.](#)
 15. González-Cano, P. *et al.* (2014) Two functionally distinct myeloid dendritic cell subpopulations are present in bovine blood. [Dev Comp Immunol. 44 \(2\): 378-88.](#)
 16. Di Palma, S. *et al.* (2012) Comparative spatiotemporal analysis of the intrathecal immune response in natural listeric rhombencephalitis of cattle and small ruminants. [Comp Immunol Microbiol Infect Dis. 35 \(5\): 429-41.](#)
 17. Pirson, C. *et al.* (2015) Highly purified mycobacterial phosphatidylinositol mannosides drive cell-mediated responses and activate NKT cells in cattle. [Clin Vaccine Immunol. 22 \(2\): 178-84.](#)
 18. Schneider, D.A. *et al.* (2011) Dynamics of bovine spleen cell populations during the acute response to *Babesia bovis* infection: an immunohistological study. [Parasite Immunol. 33 \(1\): 34-44.](#)
 19. Van Meulder F *et al.* (2015) Analysis of the protective immune response following intramuscular vaccination of calves against the intestinal parasite *Cooperia oncophora*. [Int J Parasitol. 45 \(9-10\): 637-46.](#)
 20. Patch, J.R. *et al.* (2014) Infection with foot-and-mouth disease virus (FMDV) induces a natural killer (NK) cell response in cattle that is lacking following vaccination. [Comp Immunol Microbiol Infect Dis. 37 \(4\): 249-57.](#)
 21. Hedges, J.F. *et al.* (2015) Amphotericin B stimulates $\gamma\delta$ T and NK cells, and enhances protection from *Salmonella* infection. [Innate Immun. 21 \(6\): 598-608.](#)
 22. Allan, A.J. *et al.* (2015) Cattle NK Cell Heterogeneity and the Influence of MHC Class I. [J Immunol. 195 \(5\): 2199-206.](#)
 23. Maślanka, T. *et al.* (2016) Prostaglandin E₂ exerts the proapoptotic and antiproliferative effects on bovine NK cells [Res Vet Sci. 107: 80-7.](#)
 24. Hecker YP *et al.* (2015) Cell mediated immune responses in the placenta following challenge of vaccinated pregnant heifers with *Neospora caninum*. [Vet Parasitol. 214 \(3-4\): 247-54.](#)

25. Ohira K *et al.* (2016) Bovine leukemia virus reduces anti-viral cytokine activities and NK cytotoxicity by inducing TGF- β secretion from regulatory T cells. [Immun Inflamm Dis. 4 \(1\): 52-63.](#)
26. Johnson, W.C. *et al.* (2008) Bovine WC1(-) $\gamma\delta$ T cells incubated with IL-15 express the natural cytotoxicity receptor CD335 (NKp46) and produce IFN- γ in response to exogenous IL-12 and IL-18. [Dev Comp Immunol. 32 \(8\): 1002-10.](#)
27. Sipka, A. *et al.* (2016) Bovine natural killer cells are present in *Escherichia coli* infected mammary gland tissue and show antimicrobial activity *in vitro*. [Comp Immunol, Microbiol Infect Dis. 48: 54-60.](#)
28. Hamilton, C.A. *et al.* (2016) Interactions between natural killer cells and dendritic cells favour T helper1-type responses to BCG in calves. [Vet Res. 47 \(1\): 85.](#)
29. Krueger, L.A. *et al.* (2016) Gamma delta T cells are early responders to *Mycobacterium avium* ssp. *paratuberculosis* in colostrum-replete Holstein calves. [J Dairy Sci. Sep 7. pii: S0022-0302\(16\)30611-7. \[Epub ahead of print\]](#)
30. Steinbach, S. *et al.* (2016) CD4+ and $\gamma\delta$ T Cells are the main Producers of IL-22 and IL-17A in Lymphocytes from *Mycobacterium bovis*-infected Cattle. [Sci Rep. 6: 29990.](#)
31. Rutigliano, H.M. *et al.* (2016) Trophoblast Major Histocompatibility Complex Class I Expression Is Associated with Immune-Mediated Rejection of Bovine Fetuses Produced by Cloning. [Biol Reprod. 95 \(2\): 39.](#)
32. González-Hernández A *et al.* (2016) Host protective ASP-based vaccine against the parasitic nematode *Ostertagia ostertagi* triggers NK cell activation and mixed IgG1-IgG2 response. [Sci Rep. 6: 29496.](#)
33. Khosa, S. *et al.* (2020) Bovine Adenovirus-3 Tropism for Bovine Leukocyte Sub-Populations. [Viruses. 12 \(12\)Dec 12 \[Epub ahead of print\].](#)
34. Denholm, S.J. *et al.* (2017) Estimating genetic and phenotypic parameters of cellular immune-associated traits in dairy cows. [J Dairy Sci. 100 \(4\): 2850-2862.](#)
35. Hamilton, C.A. *et al.* (2017) Frequency and phenotype of natural killer cells and natural killer cell subsets in bovine lymphoid compartments and blood. [Immunology. 151 \(1\): 89-97.](#)
36. Bassi, P.B. *et al.* (2018) Parasitological and immunological evaluation of cattle experimentally infected with *Trypanosoma vivax*. [Exp Parasitol. 185: 98-106.](#)
37. de Araújo, F.F. *et al.* (2019) Distinct immune response profile during *Rhipicephalus* (*Boophilus*) *microplus*. infestations of guzerat dairy herd according to the maternal lineage ancestry (mitochondrial DNA). [Vet Parasitol. 273: 36-44.](#)
38. Nakajima, N. *et al.* (2019) Effects of direct exposure to cold weather under grazing in winter on the physiological, immunological, and behavioral conditions of Japanese Black beef cattle in central Japan. [Anim Sci J. 90 \(8\): 1033-1041.](#)
39. Okino, C.H. *et al.* (2020) A polymorphic CD4 epitope related to increased susceptibility to *Babesia bovis*. in Canchim calves. [Vet Immunol Immunopathol. 230: 110132.](#)
40. de Araújo, F.F. *et al.* (2019) Distinct immune response profile during *Rhipicephalus* (*Boophilus*) *microplus*. infestations of guzerat dairy herd according to the maternal lineage ancestry (mitochondrial DNA). [Vet Parasitol. 273: 36-44.](#)
41. Colombatti Olivieri, M.A. *et al.* (2021) Evaluation of a virulent strain of *Mycobacterium avium*. subsp. *paratuberculosis*. used as a heat-killed vaccine. [Vaccine. Nov 10;S0264-410X\(21\)01433-X.](#)

Further Reading

1. Sivori, S. *et al.* (1997) p46, a novel natural killer cell-specific surface molecule that

mediates cell activation. [J Exp Med. 186 \(7\): 1129-36.](#)

2. Storset, A.K. *et al.* (2003) Natural killer cell receptors in cattle: a bovine killer cell immunoglobulin-like receptor multigene family contains members with divergent signaling motifs. [Eur J Immunol. 33 \(4\): 980-90.](#)

Storage This product is shipped at ambient temperature. It is recommended to aliquot and store at -20°C on receipt. When thawed, aliquot the sample as needed. Keep aliquots at 2-8°C for short term use (up to 4 weeks) and store the remaining aliquots at -20°C.

Avoid repeated freezing and thawing as this may denature the antibody. Storage in frost-free freezers is not recommended.

Guarantee 12 months from date of despatch

Health And Safety Information Material Safety Datasheet documentation #10040 available at: 10040: <https://www.bio-rad-antibodies.com/uploads/MSDS/10040.pdf>

Regulatory For research purposes only

Related Products

Recommended Secondary Antibodies

Goat Anti Mouse IgG (STAR77...) [HRP](#)
Rabbit Anti Mouse IgG (STAR12...) [RPE](#)
Goat Anti Mouse IgG (STAR70...) [FITC](#)
Goat Anti Mouse IgG IgA IgM (STAR87...) [Alk. Phos.](#), [HRP](#)
Rabbit Anti Mouse IgG (STAR9...) [FITC](#)
Goat Anti Mouse IgG (STAR76...) [RPE](#)
Goat Anti Mouse IgG (H/L) (STAR117...) [Alk. Phos.](#), [DyLight®488](#), [DyLight®550](#),
[DyLight®650](#), [DyLight®680](#), [DyLight®800](#),
[FITC](#), [HRP](#)
Rabbit Anti Mouse IgG (STAR13...) [HRP](#)
Goat Anti Mouse IgG (Fc) (STAR120...) [FITC](#), [HRP](#)

Recommended Negative Controls

[MOUSE IgG1 NEGATIVE CONTROL \(MCA928\)](#)

North & South America	Tel: +1 800 265 7376 Fax: +1 919 878 3751 Email: 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	Europe	Tel: +49 (0) 89 8090 95 21 Fax: +49 (0) 89 8090 95 50 Email: 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)
'M414726:221213'

Printed on 08 Feb 2023