

## Datasheet: MCA2365A647

<b>Description:</b>	MOUSE ANTI BOVINE CD335:Alexa Fluor® 647
<b>Specificity:</b>	CD335
<b>Other names:</b>	NKp46
<b>Format:</b>	ALEXA FLUOR® 647
<b>Product Type:</b>	Monoclonal Antibody
<b>Clone:</b>	AKS1
<b>Isotype:</b>	IgG1
<b>Quantity:</b>	100 TESTS/1ml

### 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 antibody has not been tested for use in a particular technique this does not necessarily exclude its use in such procedures. It is recommended that the user titrates the antibody for use in their own system to a concentration equivalent to their test reagent.

#### Target Species

Bovine

#### Species Cross Reactivity

Reacts with: American Bison

**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.

#### Product Form

Purified IgG conjugated to Alexa Fluor 647 - liquid

Max Ex/Em	Fluorophore	Excitation Max (nm)	Emission Max (nm)
	Alexa Fluor®647	650	665

#### Preparation

Purified IgG prepared by affinity chromatography on Protein A

#### Buffer Solution

Phosphate buffered saline

#### Preservative

0.09% Sodium Azide (NaN<sub>3</sub>)

<b>Stabilisers</b>	1% Bovine Serum Albumin
<b>Approx. Protein Concentrations</b>	IgG concentration 0.05 mg/ml
<b>Immunogen</b>	Fusion protein consisting of the extracellular region of bovine CD335.
<b>External Database Links</b>	<p><b>UniProt:</b>  <a href="#">Q863H2</a>    <a href="#">Related reagents</a></p> <p><b>Entrez Gene:</b>  <a href="#">369024</a>    NCR1    <a href="#">Related reagents</a></p>
<b>Fusion Partners</b>	Spleen cells from immunised Balb/c mice were fused with cells of the NS-0 myeloma cell line.
<b>Specificity</b>	<p><b>Mouse anti Bovine CD335 antibody, clone AKS1</b> 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 (<a href="#">Sivori <i>et al.</i> 1997</a>). The bovine homologue is expressed on bovine NK cells (<a href="#">Storset <i>et al.</i> 2004</a>) and no expression of CD335 has been detected on B cells, T cells, monocytes or granulocytes.</p> <p>Clone AKS1 is reported to activate lysis of FcγR-expressing cell line P815, by IL-2 activated NKp46+ cells (<a href="#">Storset <i>et al.</i> 2004</a>).</p>
<b>Flow Cytometry</b>	Use 10ul of the suggested working dilution to label 10 <sup>6</sup> cells in 100ul.
<b>References</b>	<ol style="list-style-type: none"> <li>1. Storset, A.K. <i>et al.</i> (2004) NKp46 defines a subset of bovine leukocytes with natural killer cell characteristics. <a href="#">Eur J Immunol. 34 (3): 669-76.</a></li> <li>2. Kulberg, S. <i>et al.</i> (2004) Reference values for relative numbers of natural killer cells in cattle blood. <a href="#">Dev Comp Immunol. 28 (9): 941-8.</a></li> <li>3. Van Rhijn, I. <i>et al.</i> (2007) Massive, sustained γδ T cell migration from the bovine skin <i>in vivo</i>. <a href="#">J Leukoc Biol. 81: 968-73.</a></li> <li>4. Toka, F.N. <i>et al.</i> (2011) Rapid and Transient Activation of γδ T Cells to IFN-γ Production, NK Cell-Like Killing, and Antigen Processing during Acute Virus Infection. <a href="#">J Immunol. 186: 4853-61.</a></li> <li>5. Bastos, R.G. <i>et al.</i> (2008) Bovine NK cells acquire cytotoxic activity and produce IFN-γ after stimulation by <i>Mycobacterium bovis</i> BCG- or <i>Babesia bovis</i>-exposed splenic dendritic cells. <a href="#">Vet Immunol Immunopathol. 124: 302-12.</a></li> <li>6. Boysen P <i>et al.</i> (2006) Bovine CD2-/NKp46+ cells are fully functional natural killer cells with a high activation status. <a href="#">BMC Immunol. 7: 10.</a></li> <li>7. Elhmouzi-Younes, J. <i>et al.</i> (2009) Bovine neonate natural killer cells are fully functional and highly responsive to interleukin-15 and to NKp46 receptor stimulation. <a href="#">Vet Res. 40: 54.</a></li> <li>8. Elhmouzi-Younes, J. <i>et al.</i> (2010) Ovine CD16+/CD14- blood lymphocytes present all the major characteristics of natural killer cells. <a href="#">Vet Res. 41:4.</a></li> </ol>

9. Hoek, A. *et al.* (2009) Subpopulations of bovine WC1(+)  $\gamma\delta$  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(-)  $\gamma\delta$ T cells, not CD8(+)  $\alpha\beta$  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, oenothin 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 E<sub>2</sub> 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- $\beta$  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- $\gamma$  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

---

**Acknowledgements** This product is provided under an intellectual property licence from Life Technologies Corporation. The transfer of this product is contingent on the buyer using the purchased product solely in research, excluding contract research or any fee for service research, and the buyer must not sell or otherwise transfer this product or its components for (a) diagnostic, therapeutic or prophylactic purposes; (b) testing, analysis or screening services, or information in return for compensation on a per-test basis; (c) manufacturing or quality assurance or quality control, or (d) resale, whether or not resold for use in research. For information on purchasing a license to this product for purposes other than as described above, contact Life Technologies Corporation, 5791 Van Allen Way, Carlsbad CA 92008 USA or [outlicensing@thermofisher.com](mailto:outlicensing@thermofisher.com)

---

**Health And Safety Information** Material Safety Datasheet documentation #10041 available at: 10041: <https://www.bio-rad-antibodies.com/uploads/MSDS/10041.pdf>

---

**Regulatory** For research purposes only

---

## Related Products

### Recommended Negative Controls

[MOUSE IgG1 NEGATIVE CONTROL:Alexa Fluor® 647 \(MCA928A647\)](#)

**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://bio-rad-antibodies.com/datasheets)

'M384339:210513'

**Printed on 16 Nov 2021**

---

© 2021 Bio-Rad Laboratories Inc | [Legal](#) | [Imprint](#)