

## Datasheet: MCA1038A488

<b>Description:</b>	RAT ANTI DOG CD4:Alexa Fluor® 488
<b>Specificity:</b>	CD4
<b>Format:</b>	ALEXA FLUOR® 488
<b>Product Type:</b>	Monoclonal Antibody
<b>Clone:</b>	YKIX302.9
<b>Isotype:</b>	IgG2a
<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 - 1/10

Where this antibody 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 antibody for use in their own system using appropriate negative/positive controls.

<b>Target Species</b>	Dog		
<b>Product Form</b>	Purified IgG conjugated to Alexa Fluor 488 - liquid		
<b>Max Ex/Em</b>	<b>Fluorophore</b>	<b>Excitation Max (nm)</b>	<b>Emission Max (nm)</b>
	Alexa Fluor®488	495	519
<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 Stabilisers</b>	0.09% sodium azide (NaN <sub>3</sub> )		
	1% bovine serum albumin		
<b>Approx. Protein Concentrations</b>	IgG concentration 0.05 mg/ml		
<b>Immunogen</b>	Canine concanavilin A activated T cell blasts.		

<b>External Database Links</b>	<b>UniProt:</b> <a href="#">P33705</a> <a href="#">Related reagents</a>
	<b>Entrez Gene:</b> <a href="#">403931</a> CD4 <a href="#">Related reagents</a>
<b>RRID</b>	AB_10588030
<b>Fusion Partners</b>	Spleen cells from immunized DA rats were fused with cells of the Y3/Ag1.2.3 rat myeloma cell line.
<b>Specificity</b>	<p><b>Rat anti Dog CD4 antibody, clone YKIX302.9</b>, is a monoclonal antibody specific for the canine CD4 cell surface antigen. Clone YKIX302.9 was clustered at the first Canine Leukocyte Antigen Workshop (CLAW) [<a href="#">Cobbold et al. 1992</a>] along with clone <a href="#">CA13.1E4</a>.</p> <p>Rat anti Dog CD4 antibody, clone YKIX302.9 partially depletes circulating T lymphocytes when administered <i>in vivo</i>, but alone is not sufficient to prolong allograft survival in a canine transplant model (<a href="#">Watson et al. 1993</a>).</p> <p>Uniquely amongst mammals, canine CD4 is expressed by neutrophils as well as by lymphocyte subsets (<a href="#">Moore et al. 1992</a>).</p>
<b>Flow Cytometry</b>	Use 10µl of the suggested working dilution to label 10 <sup>6</sup> cells or 100µl whole blood
<b>References</b>	<ol style="list-style-type: none"> <li>1. Watson, C.J. <i>et al.</i> (1993) CD4 and CD8 monoclonal antibody therapy: strategies to prolong renal allograft survival in the dog. <a href="#">Br J Surg. 80 (11): 1389-92.</a></li> <li>2. Gorman, S.D. <i>et al.</i> (1994) Isolation and expression of cDNA encoding the canine CD4 and CD8 alpha antigens. <a href="#">Tissue Antigens. 43 (3): 184-8.</a></li> <li>3. Out, T.A. <i>et al.</i> (2002) Local T-cell activation after segmental allergen challenge in the lungs of allergic dogs. <a href="#">Immunology. 105: 499-508.</a></li> <li>4. Benyacoub, J. <i>et al.</i> (2003) Supplementation of food with <i>Enterococcus faecium</i> (SF68) stimulates immune functions in young dogs. <a href="#">J Nutr. 133: 1158-62.</a></li> <li>5. Bauer, T.R. Jr. <i>et al.</i> (2006) Correction of the disease phenotype in canine leukocyte adhesion deficiency using ex vivo hematopoietic stem cell gene therapy. <a href="#">Blood. 108: 3313-20.</a></li> <li>6. Reis, A.B. <i>et al.</i> (2006) Phenotypic features of circulating leucocytes as immunological markers for clinical status and bone marrow parasite density in dogs naturally infected by <i>Leishmania chagasi</i>. <a href="#">Clin Exp Immunol. 146: 303-11.</a></li> <li>7. Miranda, S. <i>et al.</i> (2007) Characterization of circulating lymphocyte subpopulations in canine leishmaniasis throughout treatment with antimonials and allopurinol. <a href="#">Vet Parasitol. 144 (3-4): 251-60.</a></li> <li>8. Yasuda, N. <i>et al.</i> (2008) CC chemokine receptor 4-positive CD4(+) lymphocytes in peripheral blood increases during maturation in healthy beagles. <a href="#">J Vet Med Sci. 70 (9): 989-92.</a></li> <li>9. Papadogiannakis, E.I. <i>et al.</i> (2009) Determination of intracellular cytokines IFN-gamma and IL-4 in canine T lymphocytes by flow cytometry following whole-blood culture. <a href="#">Can J Vet Res. 73 (2): 137-43.</a></li> </ol>

10. Estrela-Lima, A. *et al.* (2010) Immunophenotypic features of tumor infiltrating lymphocytes from mammary carcinomas in female dogs associated with prognostic factors and survival rates. [BMC Cancer. 10: 256.](#)
11. Boggiatto, P.M. *et al.* (2010) Immunologic indicators of clinical progression during canine *Leishmania infantum* infection. [Clin Vaccine Immunol. 17: 267-73.](#)
12. Tominaga, M. *et al.* (2010) Flow cytometric analysis of peripheral blood and tumor-infiltrating regulatory T cells in dogs with oral malignant melanoma. [J Vet Diagn Invest. 22: 438-41.](#)
13. Bund, D. *et al.* (2010) Canine-DCs using different serum-free methods as an approach to provide an animal-model for immunotherapeutic strategies. [Cell Immunol. 263: 88-98.](#)
14. Pinheiro, D. (2011) Phenotypic and functional characterization of a CD4(+) CD25(high) FOXP3(high) regulatory T-cell population in the dog. [Immunology. 132: 111-22.](#)
15. Araújo, M.S. *et al.* (2011) Immunological changes in canine peripheral blood leukocytes triggered by immunization with first or second generation vaccines against canine visceral leishmaniasis. [Vet Immunol Immunopathol. 141: 64-75.](#)
16. Mitchell, L. *et al.* (2012) Induction of remission results in spontaneous enhancement of anti-tumor cytotoxic T-lymphocyte activity in dogs with B cell lymphoma. [Vet Immunol Immunopathol. 145 \(3-4\): 597-603.](#)
17. Mitchell, L. *et al.* (2012) Clinical and immunomodulatory effects of toceranib combined with low-dose cyclophosphamide in dogs with cancer. [J Vet Intern Med. 26: 355-62.](#)
18. Aricò, A. *et al.* (2013) The role of vascular endothelial growth factor and matrix metalloproteinases in canine lymphoma: *in vivo* and *in vitro* study. [BMC Vet Res. 9: 94.](#)
19. Michael HT *et al.* (2013) Isolation and characterization of canine natural killer cells. [Vet Immunol Immunopathol. 155 \(3\): 211-7.](#)
20. Figueiredo, M.M. *et al.* (2014) Expression of Regulatory T Cells in Jejunum, Colon, and Cervical and Mesenteric Lymph Nodes of Dogs Naturally Infected with *Leishmania infantum*. [Infect Immun. 82: 3704-12.](#)
21. Aresu, L. *et al.* (2014) VEGF and MMP-9: biomarkers for canine lymphoma. [Vet Comp Oncol. 12: 29-36.](#)
22. Duz AL *et al.* (2014) The TcI and TcII *Trypanosoma cruzi* experimental infections induce distinct immune responses and cardiac fibrosis in dogs. [Mem Inst Oswaldo Cruz. 109 \(8\): 1005-13.](#)
23. Gelain, M.E. *et al.* (2014) CD44 in canine leukemia: analysis of mRNA and protein expression in peripheral blood. [Vet Immunol Immunopathol. 159 \(1-2\): 91-6.](#)
24. Yamaya, Y. & Watari, T. (2015) Increased proportions of CCR4(+) cells among peripheral blood CD4(+) cells and serum levels of allergen-specific IgE antibody in canine chronic rhinitis and bronchitis. [J Vet Med Sci. 77 \(4\): 421-5.](#)
25. Miller, J. *et al.* (2015) Humoral and Cellular Immune Response in Canine Hypothyroidism. [J Comp Pathol. 153 \(1\): 28-37.](#)
26. Viana, K.F. *et al.* (2015) Setting the proportion of CD4+ and CD8+ T-cells co-cultured with canine macrophages infected with *Leishmania chagasi*. [Vet Parasitol. 211 \(3-4\): 124-32.](#)
27. Costa-Pereira, C. *et al.* (2015) One-year timeline kinetics of cytokine-mediated cellular immunity in dogs vaccinated against visceral leishmaniasis. [BMC Vet Res. 11 \(1\): 92.](#)
28. Hauck, V. *et al.* (2016) Increased numbers of FoxP3-expressing CD4(+) CD25(+) regulatory T cells in peripheral blood from dogs with atopic dermatitis and its correlation with disease severity. [Vet Dermatol. 27 \(1\): 26-e9.](#)

29. Riondato, F. *et al.* (2016) Analytical and diagnostic validation of a flow cytometric strategy to quantify blood and marrow infiltration in dogs with large B-cell lymphoma. [Cytometry B Clin Cytom. 90 \(6\): 525-30.](#)
30. Bonnefont-Rebeix, C. *et al.* (2016) Characterization of a novel canine T-cell line established from a spontaneously occurring aggressive T-cell lymphoma with large granular cell morphology. [Immunobiology. 221 \(1\): 12-22.](#)
31. Viana, K.F. *et al.* (2016) Application of rapid in vitro co-culture system of macrophages and T-cell subsets to assess the immunogenicity of dogs vaccinated with live attenuated *Leishmania donovani* centrin deleted parasites (LdCen-/-). [Parasit Vectors. 9: 250.](#)
32. Munhoz.T.D. *et al.* (2016) Regulatory T cells in dogs with multicentric lymphoma: peripheral blood quantification at diagnosis and after initial stage chemotherapy. [Arq. Bras. Med. Vet. Zootec. 68 \(1\): 1-9.](#)
33. Tagawa, M. *et al.* (2016) Evaluation of Costimulatory Molecules in Peripheral Blood Lymphocytes of Canine Patients with Histiocytic Sarcoma. [PLoS One. 11 \(2\): e0150030.](#)
34. Schaut, R.G. *et al.* (2016) Regulatory IgDhi B Cells Suppress T Cell Function via IL-10 and PD-L1 during Progressive Visceral Leishmaniasis. [J Immunol. 196 \(10\): 4100-9.](#)
35. Schaut, R.G. *et al.* (2016) Recovery of antigen-specific T cell responses from dogs infected with *Leishmania (L.) infantum* by use of vaccine associated TLR-agonist adjuvant. [Vaccine. 34 \(44\): 5225-34.](#)
36. Deravi, N. *et al.* (2017) Specific immunotypes of canine T cell lymphoma are associated with different outcomes. [Vet Immunol Immunopathol. 191: 5-13.](#)
37. Bahamondes, F. *et al.* (2017) Omental adipose tissue is a more suitable source of canine Mesenchymal stem cells. [BMC Vet Res. 13 \(1\): 166.](#)
38. Roatt, B.M. *et al.* (2017) A Vaccine Therapy for Canine Visceral Leishmaniasis Promoted Significant Improvement of Clinical and Immune Status with Reduction in Parasite Burden. [Front Immunol. 8: 217.](#)
39. Anai, L.A. *et al.* (2017) Quantification of Treg cells in peripheral blood and lymph nodes of dogs with multicentric lymphoma [Arq Bras Med Vet Zootec. 69 \(6\): 1496-502.](#)
40. Pellin, M.A. *et al.* (2017) Safety evaluation of combination doxorubicin and toceranib phosphate (Palladia®) in tumour bearing dogs: a phase I dose-finding study. [Vet Comp Oncol. 15 \(3\): 919-31.](#)
41. Martins, G.C. *et al.* (2018) Clinical-pathological and immunological biomarkers in dogs with atopic dermatitis. [Vet Immunol Immunopathol. 205: 58-64.](#)
42. Withers, S.S. *et al.* (2018) Multi-color flow cytometry for evaluating age-related changes in memory lymphocyte subsets in dogs. [Dev Comp Immunol. 87: 64-74.](#)
43. DeClue, A.E. *et al.* (2018) Identification of immunologic and clinical characteristics that predict inflammatory response to C. Novyi-NT bacteriolytic immunotherapy. [BMC Vet Res. 14 \(1\): 119.](#)
44. DaSilva, A.V.A. *et al.* (2018) Morphophysiological changes in the splenic extracellular matrix of *Leishmania infantum*-naturally infected dogs is associated with alterations in lymphoid niches and the CD4+ T cell frequency in spleens. [PLoS Negl Trop Dis. 12 \(4\): e0006445.](#)
45. Lisiecka, U. *et al.* (2019) Evaluation of T regulatory lymphocytes and serum concentration of selected cytokines in dogs with perianal tumors. [Vet Immunol Immunopathol. 207: 10-17.](#)
46. Akiyama, S. *et al.* (2019) Th17 cells increase during maturation in peripheral blood of healthy dogs. [Vet Immunol Immunopathol. 209: 17-21.](#)

47. Martini, V. *et al.* (2019) Prognostic role of non-neoplastic lymphocytes in lymph node aspirates from dogs with diffuse large B-cell lymphoma treated with chemo-immunotherapy. [Res Vet Sci. 125: 130-5.](#)
48. Aguiar-Soares, R.D.O. *et al.* (2020) Phase I and II Clinical Trial Comparing the LBSap, Leishmune<sup>®</sup>, and Leish-Tec<sup>®</sup> Vaccines against Canine Visceral Leishmaniasis. [Vaccines \(Basel\). 8 \(4\): 690.](#)
49. Wolf-Ringwall, A. *et al.* (2020) Prospective evaluation of flow cytometric characteristics, histopathologic diagnosis and clinical outcome in dogs with naïve B-cell lymphoma treated with a 19-week CHOP protocol. [Vet Comp Oncol. 18 \(3\): 342-52.](#)
50. Sayag, D. *et al.* (2020) Proof-of-concept study: Evaluation of plasma and urinary electrolytes as markers of response to L-asparaginase therapy in dogs with high-grade lymphoma. [Vet Clin Pathol. 49 \(3\): 476-83.](#)
51. Lee, J. *et al.* (2021) Canine Natural Killer Cell-Derived Exosomes Exhibit Antitumor Activity in a Mouse Model of Canine Mammary Tumor. [Biomed Res Int. 2021: 6690704.](#)
52. Grudzien, M. *et al.* (2021) A newly established canine NK-type cell line and its cytotoxic properties. [Vet Comp Oncol. 19 \(3\): 567-77.](#)
53. Lee, S.H. *et al.* (2021) Safety and immunological effects of recombinant canine IL-15 in dogs. [Cytokine. 148: 155599.](#)
54. Knebel, A. *et al.* (2021) Measurement of canine Th17 cells by flow cytometry. [Vet Immunol Immunopathol. 243: 110366.](#)
55. Konno, H. *et al.* (2022) An experimental challenge model for *Leishmania donovani* in beagle dogs, showing a similar pattern of parasite burden in the peripheral blood and liver. [Parasitol Res. 121 \(12\): 3569-79.](#)
56. Kanei, T. *et al.* (2022) Expression and functional analysis of chemokine receptor 7 in canine lymphoma cell lines. [J Vet Med Sci. 84 \(1\): 25-30.](#)
57. do Prado Duzanski, A. *et al.* (2022) Cell-mediated immunity and expression of MHC class I and class II molecules in dogs naturally infected by canine transmissible venereal tumor: Is there complete spontaneous regression outside the experimental CTVT? [Res Vet Sci. 145: 193-204.](#)
58. Karayannopoulou, M. *et al.* (2022) Effect of major versus minor mastectomy on host immunity in canine mammary cancer [Vet Immunol Immunopathol. Feb 24: 110403.](#)
59. Bragato, J.P. *et al.* (2022) miRNA-21 regulates CD69 and IL-10 expression in canine leishmaniasis. [PLoS One. 17 \(3\): e0265192.](#)
60. Riccardo, F. *et al.* (2022) Antigen mimicry as an effective strategy to induce CSPG4-targeted immunity in dogs with oral melanoma: a veterinary trial. [J Immunother Cancer. 10\(5\):e004007.](#)
61. Matralis, D.T. *et al.* (2023) Intracellular IFN- $\gamma$  and IL-4 levels of CD4 + and CD8 + T cells in the peripheral blood of naturally infected (*Leishmania infantum*) symptomatic dogs before and following a 4-week treatment with miltefosine and allopurinol: a double-blinded, controlled and cross-sectional study. [Acta Vet Scand. 65 \(1\): 2.](#)
62. Hamouzová, P. *et al.* (2023) Lymphocyte immunophenotyping in dogs with lymphopenia of common causes. [Vet Immunol Immunopathol. 261: 110620.](#)
63. Tarone, L. *et al.* (2023) A chimeric human/dog-DNA vaccine against CSPG4 induces immunity with therapeutic potential in comparative preclinical models of osteosarcoma. [Mol Ther. 31 \(8\): 2342-59.](#)
64. Yamauchi, A. *et al.* (2023) Negative Influence of Aging on Differentiation and Proliferation of CD8(+) T-Cells in Dogs. [Vet Sci. 10 \(9\): 541.](#)

65. Bencze, M. *et al.* (2023) Receptor interacting protein kinase-3 mediates both myopathy and cardiomyopathy in preclinical animal models of Duchenne muscular dystrophy. [J Cachexia Sarcopenia Muscle. Nov 01 \[Epub ahead of print\].](#)
66. Martini, V. *et al.* (2018) A retrospective study of flow cytometric characterization of suspected extranodal lymphomas in dogs. [J Vet Diagn Invest. 30 \(6\): 830-6.](#)
67. DeClue, A.E. *et al.* (2020) Transportation and Routine Veterinary Interventions Alter Immune Function in the Dog. [Top Companion Anim Med. 39: 100408.](#)
68. Lee, G.W. *et al.* (2021) Case Report: Long-Term Survival of a Dog With Chronic Lymphocytic Leukemia Treated With Chlorambucil, Prednisolone, and Imatinib. [Front Vet Sci. 8: 625527.](#)
69. Sainz, Á. *et al.* (2021) Effect of chemically modified tetracycline-8 (CMT-8) on hematology, blood chemistry, cytokines and peripheral blood lymphocyte subsets of healthy dogs. [Res Vet Sci. 136: 200-8.](#)
70. Kang, S.J. *et al.* (2023) Immunomodulatory effects of canine mesenchymal stem cells in an experimental atopic dermatitis model. [Front Vet Sci. 10: 1201382.](#)
71. Sheng, R. *et al.* (2023) Prognostic significance of CD25 expression in dogs with a noninvasive diagnosis of B-cell lymphoma treated with CHOP chemotherapy. [Vet Comp Oncol. 21 \(1\): 28-35.](#)
72. Miguelena Chamorro, B. *et al.* (2023) Characterization of Canine Peyer's Patches by Multidimensional Analysis: Insights from Immunofluorescence, Flow Cytometry, and Single-Cell RNA Sequencing. [Immunohorizons. 7 \(11\): 788-805.](#)
73. Stokol, T. *et al.* (2024) Flow cytometric-based detection of CD80 is a useful diagnostic marker of acute myeloid leukemia in dogs. [Front Vet Sci. 11: 1405297.](#)
74. Rogato, F. *et al.* (2024) Leukemia cutis as a prominent clinical sign in a dog with acute myeloid leukemia. [Vet Clin Pathol. 53 \(4\): 448-457.](#)

---

**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. This product is photosensitive and should be protected from light.

---

**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 purchase 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**

Material Safety Datasheet documentation #10041 available at:

**Information** <https://www.bio-rad-antibodies.com/SDS/MCA1038A488>

---

**Regulatory** For research purposes only

---

## Related Products

### Recommended Negative Controls

[RAT IgG2a NEGATIVE CONTROL:Alexa Fluor® 488 \(MCA1212A488\)](#)

**Product inquiries:** [www.bio-rad-antibodies.com/technical-support](http://www.bio-rad-antibodies.com/technical-support)

To find a batch/lot specific datasheet for this product, please use our online search tool at: [bio-rad-antibodies.com/datasheets](http://bio-rad-antibodies.com/datasheets)  
'M407904:221010'

**Printed on 17 Jul 2025**

---

© 2025 Bio-Rad Laboratories Inc | [Legal](#) | [Imprint](#)