

Datasheet: MCA2235BT

Description:	RAT ANTI MOUSE CD206:Biotin
Specificity:	CD206
Other names:	MANNOSE RECEPTOR C TYPE 1
Format:	Biotin
Product Type:	Monoclonal Antibody
Clone:	MR5D3
Isotype:	IgG2a
Quantity:	25 µg

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)	▪			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 their own system using appropriate negative/positive controls.

(1) CD206 is expressed weakly at the cell surface. Staining may be increased following membrane permeabilisation. Bio-Rad recommends the use of Leucoperm (Product Code [BUF09](#)) for this purpose.

Target Species	Mouse
Product Form	Purified IgG conjugated to biotin - 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 (NaN ₃) 1% bovine serum albumin
Approx. Protein Concentrations	IgG concentration 0.1 mg/ml

Immunogen Chimaeric CRD4-7-Fc protein

External Database Links

UniProt:

[Q61830](#) [Related reagents](#)

Entrez Gene:

[17533](#) Mrc1 [Related reagents](#)

RRID AB_1101315

Fusion Partners Spleen cells from immunized Fischer rats were fused with cells of the Y3 myeloma cell line

Specificity **Rat anti Mouse CD206 antibody, clone MR5D3** recognizes the mouse mannose receptor, a ~175 kDa type 1 membrane glycoprotein that is also known as CD206. CD206 is expressed on most tissue macrophages, certain endothelial cells and *in vitro* derived dendritic cells ([Zamze et al. 2002](#)).

The mannose receptor, CD206, is composed of a N-terminal cysteine-rich domain, a fibronectin type II domain, eight tandemly arranged C-type lectin domains (CTLD), a transmembrane domain, and a cytoplasmic domain. The terminal cysteine-rich domain binds sulfated sugars, and the CTLD recognizes carbohydrates terminating in mannose, fucose and N-acetylglucosamine, all sugars found on microorganisms and on some endogenous proteins ([Su et al. 2005](#)).

Rat anti mouse CD206 antibody, clone MR5D3 has been reported to be non-inhibitory for the binding of the mannose receptor to carbohydrate ligands ([Zamze et al. 2002](#)). Clone MR5D3 has also been shown to work in western blotting ([Martinez-Pomares et al. 2003](#) and [Su et al. 2005](#)).

Flow Cytometry Use 10µl of the suggested working dilution to label 10⁶ cells in 100µl. The Fc region of monoclonal antibodies may bind to cells expressing low affinity Fc receptors. This may be reduced by using SeroBlock FcR ([BUF041A/BUF041B](#)).

References

1. Martinez-Pomares, L. *et al.* (2003) Analysis of mannose receptor regulation by IL-4, IL-10, and proteolytic processing using novel monoclonal antibodies. [J Leukoc Biol. 73 \(5\): 604-13.](#)
2. Su, Y. *et al.* (2005) Glycosylation influences the lectin activities of the macrophage mannose receptor. [J Biol Chem. 280: 32811-20.](#)
3. Hassan, M.F. *et al.* (2006) The *Schistosoma mansoni* hepatic egg granuloma provides a favorable microenvironment for sustained growth of *Leishmania donovani*. [Am J Pathol. 169: 943-53.](#)
4. Devey, L. *et al.* (2009) Tissue-resident macrophages protect the liver from ischemia reperfusion injury via a heme oxygenase-1-dependent mechanism. [Mol Ther. 17: 65-72.](#)
5. Vetrone, S.A. *et al.* (2009) Osteopontin promotes fibrosis in dystrophic mouse muscle by modulating immune cell subsets and intramuscular TGF-beta. [J Clin Invest. 119: 1583-94.](#)

6. Autenrieth, S.E. & Autenrieth, I.B. (2009) Variable antigen uptake due to different expression of the macrophage mannose receptor by dendritic cells in various inbred mouse strains. [Immunology 127: 523-9.](#)
7. Westcott, D.J. *et al.* (2009) MGL1 promotes adipose tissue inflammation and insulin resistance by regulating 7/4hi monocytes in obesity. [J Exp Med. 206: 3143-56.](#)
8. Nair, M.G. *et al.* (2009) Alternatively activated macrophage-derived RELM- α is a negative regulator of type 2 inflammation in the lung. [J Exp Med. 206: 937-52.](#)
9. Takagi, H. *et al.* (2009) Cooperation of specific ICAM-3 grabbing nonintegrin-related 1 (SIGNR1) and complement receptor type 3 (CR3) in the uptake of oligomannose-coated liposomes by macrophages. [Glycobiology 19: 258-66.](#)
10. Bacci, M. *et al.* (2009) Macrophages are alternatively activated in patients with endometriosis and required for growth and vascularization of lesions in a mouse model of disease. [Am J Pathol. 175: 547-56.](#)
11. Hawkes, C.A. *et al.* (2009) Selective targeting of perivascular macrophages for clearance of beta-amyloid in cerebral amyloid angiopathy. [Proc Natl Acad Sci USA 106: 1261-6.](#)
12. deSchoolmeester, M.L. *et al.* (2009) The mannose receptor binds *Trichuris muris* excretory/secretory proteins but is not essential for protective immunity. [Immunology 126: 246-55.](#)
13. Famulski, K.S. *et al.* (2010) Alternative macrophage activation-associated transcripts in T-cell-mediated rejection of mouse kidney allografts. [Am J Transplant 10 \(3\): 490-7.](#)
14. Hardison, S.E. *et al.* (2010) Pulmonary infection with an interferon-gamma-producing *Cryptococcus neoformans* strain results in classical macrophage activation and protection. [Am J Pathol. 176: 774-85.](#)
15. Lin, J.S. *et al.* (2010) Distinct roles of complement receptor 3, Dectin-1, and sialic acids in murine macrophage interaction with *Histoplasma* yeast. [J Leukoc Biol. 88: 95-106.](#)
16. Chavele, K.M. *et al.* (2010) Mannose receptor interacts with Fc receptors and is critical for the development of crescentic glomerulonephritis in mice. [J Clin Invest. 120: 1469-78.](#)
17. Hardison, S.E. *et al.* (2010) Interleukin-17 Is Not Required for Classical Macrophage Activation in a Pulmonary Mouse Model of *Cryptococcus neoformans* Infection. [Infect Immun. 78: 5341-51.](#)
18. Asano, J. *et al.* (2010) Nucleotide oligomerization binding domain-like receptor signaling enhances dendritic cell-mediated cross-priming *in vivo*. [J Immunol. 184: 736-45.](#)
19. Dewals, B.G. *et al.* (2010) IL-4R α -independent expression of mannose receptor and Ym1 by macrophages depends on their IL-10 responsiveness. [PLoS Negl Trop Dis. 4 \(5\): e689.](#)
20. Zehner, M. *et al.* (2011) Mannose receptor polyubiquitination regulates endosomal recruitment of p97 and cytosolic antigen translocation for cross-presentation. [Proc Natl Acad Sci USA 108: 9933-8.](#)
21. Geier, H. & Celli, J. (2011) Phagocytic receptors dictate phagosomal escape and intracellular proliferation of *Francisella tularensis*. [Infect Immun. 79 \(6\): 2204-14.](#)
22. Deepe, G.S. Jr. & Buesing, W.R. (2011) Deciphering the Pathways of Death of *Histoplasma capsulatum*-Infected Macrophages: Implications for the Immunopathogenesis of Early Infection. [J Immunol. 188: 334-44.](#)
23. Kondo, Y. *et al.* (2011) Macrophages counteract demyelination in a mouse model of globoid cell leukodystrophy. [J Neurosci. 31: 3610-24.](#)

24. Sindrilaru, A. *et al.* (2011) An unrestrained proinflammatory M1 macrophage population induced by iron impairs wound healing in humans and mice. [J Clin Invest. 121: 985-97.](#)
25. Schneider, D. *et al.* (2012) Neonatal rhinovirus infection induces mucous metaplasia and airways hyperresponsiveness. [J Immunol. 188 \(6\): 2894-904.](#)
26. Joyce, K.L. *et al.* (2012) Using eggs from *Schistosoma mansoni* as an *in vivo* model of helminth-induced lung inflammation. [J Vis Exp. Jun 5 \(64\): e3905.](#)
27. Fridlender, Z.G. *et al.* (2013) Using macrophage activation to augment immunotherapy of established tumours. [Br J Cancer. 108 \(6\): 1288-97.](#)
28. Eskilsson, A. *et al.* (2014) Distribution of microsomal prostaglandin E synthase-1 in the mouse brain. [J Comp Neurol. 522 \(14\): 3229-44.](#)
29. Espagnolle, N. *et al.* (2014) Specific Inhibition of the VEGFR-3 Tyrosine Kinase by SAR131675 Reduces Peripheral and Tumor Associated Immunosuppressive Myeloid Cells. [Cancers \(Basel\). 6 \(1\): 472-90.](#)
30. Sameshima, A. *et al.* (2015) Teneligliptin improves metabolic abnormalities in a mouse model of postmenopausal obesity. [J Endocrinol. 227 \(1\): 25-36.](#)
31. Manning, C.N. *et al.* (2015) Adipose-derived mesenchymal stromal cells modulate tendon fibroblast responses to macrophage-induced inflammation *in vitro*. [Stem Cell Res Ther. 6: 74.](#)
32. Verheijden, S. *et al.* (2015) Identification of a chronic non-neurodegenerative microglia activation state in a mouse model of peroxisomal β -oxidation deficiency. [Glia. 63 \(9\): 1606-20.](#)
33. O'Flaherty, B.M. *et al.* (2015) CD8+ T Cell Response to Gammaherpesvirus Infection Mediates Inflammation and Fibrosis in Interferon Gamma Receptor-Deficient Mice. [PLoS One. 10 \(8\): e0135719.](#)
34. Øie, C.I. *et al.* (2016) FITC Conjugation Markedly Enhances Hepatic Clearance of N-Formyl Peptides. [PLoS One. 11 \(8\): e0160602.](#)
35. Litvack ML *et al.* (2016) Alveolar-like Stem Cell-derived Myb(-) Macrophages Promote Recovery and Survival in Airway Disease. [Am J Respir Crit Care Med. 193 \(11\): 1219-29.](#)
36. Eßlinger M *et al.* (2016) Schizophrenia associated sensory gating deficits develop after adolescent microglia activation. [Brain Behav Immun. 58: 99-106.](#)
37. Hosono, K. *et al.* (2016) Signaling of Prostaglandin E Receptors, EP3 and EP4 Facilitates Wound Healing and Lymphangiogenesis with Enhanced Recruitment of M2 Macrophages in Mice. [PLoS One. 11 \(10\): e0162532.](#)
38. Rahman, K. *et al.* (2017) Inflammatory Ly6Chi monocytes and their conversion to M2 macrophages drive atherosclerosis regression. [J Clin Invest. 127 \(8\): 2904-2915.](#)
39. Brodaczewska, K. *et al.* (2017) Biodegradable Chitosan Decreases the Immune Response to *Trichinella spiralis* in Mice. [Molecules. 22\(11\):2008.](#)
40. Braune, J. *et al.* (2017) IL-6 Regulates M2 Polarization and Local Proliferation of Adipose Tissue Macrophages in Obesity. [J Immunol. 198 \(7\): 2927-34.](#)
41. Bongiorno, E.K. *et al.* (2017) Type 1 Immune Mechanisms Driven by the Response to Infection with Attenuated Rabies Virus Result in Changes in the Immune Bias of the Tumor Microenvironment and Necrosis of Mouse GL261 Brain Tumors. [J Immunol. 198 \(11\): 4513-23.](#)
42. Orsini, F. *et al.* (2018) Mannose-Binding Lectin Drives Platelet Inflammatory Phenotype and Vascular Damage After Cerebral Ischemia in Mice via IL (Interleukin)-1 α . [Arterioscler Thromb Vasc Biol. 38 \(11\): 2678-90.](#)

43. He, S. *et al.* (2018) Endothelial extracellular vesicles modulate the macrophage phenotype: Potential implications in atherosclerosis. [Scand J Immunol. 87 \(4\): e12648.](#)
44. Micanovic, R. *et al.* (2018) Tamm-Horsfall Protein Regulates Mononuclear Phagocytes in the Kidney. [J Am Soc Nephrol. 29 \(3\): 841-856.](#)
45. Igarashi, Y. *et al.* (2018) Partial depletion of CD206-positive M2-like macrophages induces proliferation of beige progenitors and enhances browning after cold stimulation. [Sci Rep. 8 \(1\): 14567.](#)
46. Han, Y.H. *et al.* (2019) A maresin 1/ROR α /12-lipoxygenase autoregulatory circuit prevents inflammation and progression of nonalcoholic steatohepatitis. [J Clin Invest. 130. pii: 124219](#)
47. Cao, W. *et al.* (2019) Hoxa5 alleviates obesity-induced chronic inflammation by reducing ER stress and promoting M2 macrophage polarization in mouse adipose tissue. [J Cell Mol Med. 23 \(10\): 7029-42.](#)
48. Sui, A. *et al.* (2020) Inhibiting NF- κ B Signaling Activation Reduces Retinal Neovascularization by Promoting a Polarization Shift in Macrophages. [Invest Ophthalmol Vis Sci. 61 \(6\): 4.](#)
49. Welc, S.S. *et al.* (2020) Modulation of Klotho expression in injured muscle perturbs Wnt signalling and influences the rate of muscle growth. [Exp Physiol. 105 \(1\): 132-47.](#)
50. Qiao, X. *et al.* (2020) Magnesium-doped Nanostructured Titanium Surface Modulates Macrophage-mediated Inflammatory Response for Ameliorative Osseointegration. [Int J Nanomedicine. 15: 7185-98.](#)
51. Fan, A. *et al.* (2020) High-salt diet decreases mechanical thresholds in mice that is mediated by a CCR2-dependent mechanism. [J Neuroinflammation. 17 \(1\): 179.](#)
52. Shiau, D.J. *et al.* (2020) Hepatocellular carcinoma-derived high mobility group box 1 triggers M2 macrophage polarization via a TLR2/NOX2/autophagy axis. [Sci Rep. 10 \(1\): 13582.](#)
53. Kishimoto, S. *et al.* (2020) Surgical Injury and Ischemia Prime the Adipose Stromal Vascular Fraction and Increase Angiogenic Capacity in a Mouse Limb Ischemia Model. [Stem Cells Int. 2020: 7219149.](#)
54. Kalovyрна, N. *et al.* (2020) A 3'UTR modification of the TNF- α mouse gene increases peripheral TNF- α and modulates the Alzheimer-like phenotype in 5XFAD mice. [Sci Rep. 10 \(1\): 8670.](#)
55. Lei, Y. *et al.* (2021) miR-129-5p Ameliorates Ischemic Brain Injury by Binding to SIAH1 and Activating the mTOR Signaling Pathway. [J Mol Neurosci. 71 \(9\): 1761-71.](#)
56. Ackermann, J. *et al.* (2021) Myeloid Cell-Specific IL-4 Receptor Knockout Partially Protects from Adipose Tissue Inflammation. [J Immunol. Nov 17;jj2100699.](#)
57. Flores, I. *et al.* (2021) Myeloid cell-mediated targeting of LIF to dystrophic muscle causes transient increases in muscle fiber lesions by disrupting the recruitment and dispersion of macrophages in muscle. [Hum Mol Genet. ddab230.](#)
58. Lindhorst, A. *et al.* (2021) Adipocyte death triggers a pro-inflammatory response and induces metabolic activation of resident macrophages. [Cell Death Dis. 12 \(6\): 579.](#)
59. Catrysse, L. *et al.* (2021) A20 deficiency in myeloid cells protects mice from diet-induced obesity and insulin resistance due to increased fatty acid metabolism. [Cell Rep. 36 \(12\): 109748.](#)
60. Zhang, H. *et al.* (2021) Circulating Pro-Inflammatory Exosomes Worsen Stroke Outcomes in Aging. [Circ Res. 129 \(7\): e121-e140.](#)
61. Yao, Y. *et al.* (2022) Antinociceptive and anti-inflammatory activities of ethanol-soluble

- acidic component from *Ganoderma atrum* by suppressing mannose receptor [Journal of Functional Foods. 89: 104915.](#)
62. Njock, M-S. (2022) Endothelial extracellular vesicles promote tumour growth by tumour-associated macrophage reprogramming. [J Extracell Vesicles. 2022 Jun;11\(6\):e12228.](#)
63. Balza, E. *et al.* (2022) Therapeutic efficacy of proton transport inhibitors alone or in combination with cisplatin in triple negative and hormone sensitive breast cancer models. [Cancer Med. 11 \(1\): 183-93.](#)
64. Yao, Y. *et al.* (2022) Antinociceptive and anti-inflammatory activities of ethanol-soluble acidic component from *Ganoderma atrum*. by suppressing mannose receptor. [J Funct Foods.89: 104915.](#)
65. Császár, E. *et al.* (2022) Microglia modulate blood flow, neurovascular coupling, and hypoperfusion via purinergic actions. [J Exp Med. 219 \(3\): e20211071.](#)
66. Klein, D. *et al.* (2022) Early targeting of endoneurial macrophages alleviates the neuropathy and affects abnormal Schwann cell differentiation in a mouse model of Charcot-Marie-Tooth 1A. [Glia. 70 \(6\): 1100-16.](#)
67. Han, I. *et al.* (2022) Therapeutic Effect of Melittin–dKLA Targeting Tumor-Associated Macrophages in Melanoma [International Journal of Molecular Sciences. 23 \(6\): 3094.](#)
68. Louet, E.R. *et al.* (2022) tPA-NMDAR Signaling Blockade Reduces the Incidence of Intracerebral Aneurysms. [Transl Stroke Res. 13 \(6\): 1005-16.](#)
69. Vlachou, F. *et al.* (2022) Galectin-3 interferes with tissue repair and promotes cardiac dysfunction and comorbidities in a genetic heart failure model. [Cell Mol Life Sci. 79 \(5\): 250.](#)
70. Bardin, M. *et al.* (2022) The resolvin D2 - GPR18 axis is expressed in human coronary atherosclerosis and transduces atheroprotection in apolipoprotein E deficient mice. [Biochem Pharmacol. : 115075.](#)
71. Spitzel, M. *et al.* (2022) Dysregulation of Immune Response Mediators and Pain-Related Ion Channels Is Associated with Pain-like Behavior in the GLA KO Mouse Model of Fabry Disease. [Cells. 11 \(11\): 1730.](#)
72. Tsuneki, H. *et al.* (2022) Hypothalamic orexin prevents non-alcoholic steatohepatitis and hepatocellular carcinoma in obesity. [Cell Rep. 41 \(3\): 111497.](#)
73. Wang, Y. *et al.* (2022) Myeloid cell-specific mutation of Spi1 selectively reduces M2-biased macrophage numbers in skeletal muscle, reduces age-related muscle fibrosis and prevents sarcopenia. [Aging Cell. 21 \(10\): e13690.](#)
74. Femel, J. *et al.* (2022) Vaccination against galectin-1 promotes cytotoxic T-cell infiltration in melanoma and reduces tumor burden. [Cancer Immunol Immunother. 71 \(8\): 2029-40.](#)
75. Chen, Z. *et al.* (2023) Vascularized polypeptide hydrogel modulates macrophage polarization for wound healing. [Acta Biomater. 155: 218-34.](#)
76. San Emeterio, C.L. *et al.* (2017) Selective recruitment of non-classical monocytes promotes skeletal muscle repair. [Biomaterials. 117: 32-43.](#)
77. Lee, K.E. *et al.* (2018) Hif1 α Deletion Limits Tissue Regeneration via Aberrant B Cell Accumulation in Experimental Pancreatitis. [Cell Rep. 23 \(12\): 3457-64.](#)
78. Weimershaus, M. *et al.* (2020) IRAP Endosomes Control Phagosomal Maturation in Dendritic Cells. [Front Cell Dev Biol. 8: 585713.](#)
79. Hagert, C. *et al.* (2018) The Macrophage Mannose Receptor Regulate Mannan-Induced Psoriasis, Psoriatic Arthritis, and Rheumatoid Arthritis-Like Disease Models. [Front](#)

[Immunol. 9: 114.](#)

80. Ono, Y. *et al.* (2018) CD11c+ M1-like macrophages (Mø) but not CD206+ M2-like Mø are involved in folliculogenesis in mice ovary. [Sci Rep. 8 \(1\): 8171.](#)

81. Aikawa, S. *et al.* (2020) Uterine deficiency of high-mobility group box-1 (HMGB1) protein causes implantation defects and adverse pregnancy outcomes. [Cell Death Differ. 27 \(5\): 1489-504.](#)

82. Rouanet, M. *et al.* (2022) The antitumoral activity of TLR7 ligands is corrupted by the microenvironment of pancreatic tumors. [Mol Ther. 30 \(4\): 1553-63.](#)

83. Klawonn, A.M. *et al.* (2021) Microglial activation elicits a negative affective state through prostaglandin-mediated modulation of striatal neurons. [Immunity. 54 \(2\): 225-234.e6.](#)

84. Ni, Y. *et al.* (2022) CX3CL1/CX3CR1 interaction protects against lipotoxicity-induced nonalcoholic steatohepatitis by regulating macrophage migration and M1/M2 status. [Metabolism. 136: 155272.](#)

85. Colón, D.F. *et al.* (2024) Paediatric sepsis survivors are resistant to sepsis-induced long-term immune dysfunction. [Br J Pharmacol. 181 \(8\): 1308-23.](#)

86. De Vito, A. *et al.* (2020) Overexpression of Murine Rnaset2 in a Colon Syngeneic Mouse Carcinoma Model Leads to Rebalance of Intra-Tumor M1/M2 Macrophage Ratio, Activation of T Cells, Delayed Tumor Growth, and Rejection. [Cancers \(Basel\). 12 \(3\): 717.](#)

87. Ba, H. *et al.* (2021) Suppression of Transmembrane Tumor Necrosis Factor Alpha Processing by a Specific Antibody Protects Against Colitis-Associated Cancer. [Front Immunol. 12: 687874.](#)

88. Meng, X. *et al.* (2024) Inhibition of ANGPTL8 protects against diabetes-associated cognitive dysfunction by reducing synaptic loss via the PirB signaling pathway. [J Neuroinflammation. 21 \(1\): 192.](#)

89. Uekawa, K. *et al.* (2023) Border-associated macrophages promote cerebral amyloid angiopathy and cognitive impairment through vascular oxidative stress. [Mol Neurodegener. 18 \(1\): 73.](#)

90. Saraswati, S. *et al.* (2024) Renal fibroblasts are involved in fibrogenic changes in kidney fibrosis associated with dysfunctional telomeres. [Exp Mol Med. Oct 01 \[Epub ahead of print\].](#)

91. Weinstock, A. *et al.* (2021) Wnt signaling enhances macrophage responses to IL-4 and promotes resolution of atherosclerosis. [Elife. 10:e67932.](#)

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 #10041 available at: <https://www.bio-rad-antibodies.com/SDS/MCA2235BT>
10041

Regulatory

For research purposes only

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
'M413417:221122'

Printed on 30 Dec 2024

© 2024 Bio-Rad Laboratories Inc | [Legal](#) | [Imprint](#)