

Datasheet: MCA77G

BATCH NUMBER 163862

Description:	RAT ANTI TUBULIN ALPHA
Specificity:	TUBULIN ALPHA
Format:	Purified
Product Type:	Monoclonal Antibody
Clone:	YL1/2
Isotype:	IgG2a
Quantity:	0.5 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			▪	
Immunohistology - Frozen	▪			
Immunohistology - Paraffin			▪	
ELISA	▪			1/100 - 1/1000
Immunoprecipitation	▪			
Western Blotting	▪			
Immunofluorescence	▪			
Radioimmunoassays	▪			

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 using appropriate negative/positive controls.

Target Species

Yeast

Species Cross Reactivity

Reacts with: Ashbya, Human, Mouse, Dog, Rat, Pig, Drosophila, Saccharomyces, Pleurobrachia, Caenorhabditis, Dictyostelium discoideum, Xenopus, Pig-tailed macaque, Clytia sp., Arabidopsis, Strongylocentrotus purpuratus, Dendroaster excentricus, Trypanosoma brucei, Potorous tridactylis, Bovine, Hemicentrotus pulcherrimus, Potato, Bombyx mori, Rhodnius prolixus, Beroe abyssicola, Candida sp.

Does not react with: Nephrotoma suturalis

Based on sequence similarity, is expected to react with: Birds, Echinoderm, Plants, Amphibia

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 - 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
---------------------------------	--------------------

Carrier Free	Yes
---------------------	-----

Approx. Protein Concentrations	IgG concentration 1.0 mg/ml
---------------------------------------	-----------------------------

Immunogen	Yeast tubulin.
------------------	----------------

RRID	AB_325003
-------------	-----------

Fusion Partners	Spleen cells from immunized LOU rats were fused with cells of the Y3.Ag.1.2.3 rat myeloma cell line.
------------------------	--

Specificity	<p>Rat anti tubulin alpha antibody, clone YL1/2 recognizes the alpha subunit of tubulin, specifically binding tyrosylated Tubulin (Tyr-Tubulin) (Wehland et al. 1983). The epitope recognized by this antibody has been extensively studied and would appear to be a linear sequence requiring an aromatic residue at the C terminus, with the two adjacent amino acids being negatively charged (represented by Glu-Glu-Tyr in Tyr-Tubulin).</p> <p>The antibody has been used in epitope tagging procedures to detect proteins tagged with a C-terminal Gly-Gly-Phe epitope. These sequence requirements have been reported to result in some cross-reactivity with other proteins in certain circumstances, including <i>E. coli</i> rec A and oxidized actin (Burns 1987).</p> <p>Rat anti tubulin alpha antibody, clone YL1/2 is routinely tested in ELISA on tubulin.</p>
--------------------	--

Western Blotting	Rat anti tubulin alpha antibody, clone YL1/2 recognizes a band of ~55 kDa in cell lysate from a wide range of species. Rat anti tubulin alpha antibody, clone YL1/2 is suitable for use as a western blotting loading control.
-------------------------	--

References	<ol style="list-style-type: none">1. Kilmartin, J.V. <i>et al.</i> (1982) Rat monoclonal anti tubulin antibodies derived by using a new nonsecreting rat cell line. J Cell Biol. 93 (3): 576-82.2. Wehland, J. <i>et al.</i> (1983) A rat monoclonal antibody reacting specifically with the tyrosylated form of alpha-tubulin. I. Biochemical characterization, effects on microtubule polymerization <i>in vitro</i>, and microtubule polymerization and organization <i>in vivo</i>. J Cell Biol. 97 (5 Pt 1): 1467-75.
-------------------	---

3. Wehland, J. *et al.* (1984) Amino acid sequence requirements in the epitope recognized by the alpha-tubulin-specific rat monoclonal antibody YL 1/2. [EMBO J. 3 \(6\): 1295-300.](#)
4. Burns, R. (1987) Cytoskeleton. Tubulin's terminal tyrosine. [Nature. 327 \(6118\): 103-4.](#)
5. Skinner, R.H. *et al.* (1991) Use of the Glu-Glu-Phe C-terminal epitope for rapid purification of the catalytic domain of normal and mutant ras GTPase-activating proteins. [J Biol Chem. 266 \(22\): 14163-6.](#)
6. Berrueta, L. *et al.* (1998) The adenomatous polyposis coli-binding protein EB1 is associated with cytoplasmic and spindle microtubules. [Proc Natl Acad Sci U S A. 95: 10596-601.](#)
7. Gordon-Weeks, R. *et al.* (2003) Restricted spatial expression of a high-affinity phosphate transporter in potato roots. [J Cell Sci. 116: 3135-44.](#)
8. Ligon, L.A. *et al.* (2003) The microtubule plus-end proteins EB1 and dynactin have differential effects on microtubule polymerization. [Mol Biol Cell. 14: 1405-17.](#)
9. Müller, S. *et al.* (2004) The plant microtubule-associated protein AtMAP65-3/PLE is essential for cytokinetic phragmoplast function. [Curr Biol. 14: 412-7.](#)
10. Dorer, M.S. *et al.* (2006) RNA interference analysis of *Legionella* in *Drosophila* cells: exploitation of early secretory apparatus dynamics. [PLoS Pathog. 2\(4\): e34.](#)
11. Groeger, G. *et al.* (2007) Co-operative Cdc42 and Rho signalling mediates ephrinB-triggered endothelial cell retraction. [Biochem J. 404: 23-9.](#)
12. Machado, E. *et al.* (2007) Prostaglandin signaling and ovarian follicle development in the silkworm, *Bombyx mori*. [Insect Biochem Mol Biol. 37: 876-85.](#)
13. Brunk, K. *et al.* (2007) Microcephalin coordinates mitosis in the syncytial *Drosophila* embryo. [J Cell Sci. 120: 3578-88.](#)
14. Smertenko, A.P. *et al.* (2008) The C-terminal variable region specifies the dynamic properties of *Arabidopsis* microtubule-associated protein MAP65 isoforms. [Plant Cell. 20: 3346-58.](#)
15. Tinkle, C.L. *et al.* (2008) New insights into cadherin function in epidermal sheet formation and maintenance of tissue integrity. [Proc Natl Acad Sci U S A. 105: 15405-10.](#)
16. Hartl, T.A. *et al.* (2008) Condensin II resolves chromosomal associations to enable anaphase I segregation in *Drosophila* male meiosis. [PLoS Genet. 4\(10\): e1000228.](#)
17. Jager, M. *et al.* (2008) Insights into the early evolution of SOX genes from expression analyses in a ctenophore. [J Exp Zool B Mol Dev Evol. 310: 650-67.](#)
18. von Dassow, G. *et al.* (2009) Action at a distance during cytokinesis. [J Cell Biol. 187: 831-45.](#)
19. Vafopoulou, X. (2009) Ecdysteroid receptor (EcR) is associated with microtubules and with mitochondria in the cytoplasm of prothoracic gland cells of *Rhodnius prolixus* (Hemiptera). [Arch Insect Biochem Physiol. 72: 249-62.](#)
20. Dupin, I. *et al.* (2009) Classical cadherins control nucleus and centrosome position and cell polarity. [J Cell Biol. 185: 779-86.](#)
21. Heaslip, A.T. *et al.* (2009) TgICMAP1 is a novel microtubule binding protein in *Toxoplasma gondii*. [PLoS One. 4: e7406.](#)
22. Towers, E. *et al.* (2009) The proapoptotic dp5 gene is a direct target of the MLK-JNK-c-Jun pathway in sympathetic neurons. [Nucleic Acids Res. 37: 3044-60.](#)
23. Li, Y. *et al.* (2010) The type II *Arabidopsis* formin14 interacts with microtubules and microfilaments to regulate cell division. [Plant Cell. 22: 2710-26.](#)
24. Liu, D. *et al.* (2010) Regulated targeting of protein phosphatase 1 to the outer kinetochore by KNL1 opposes Aurora B kinase. [J Cell Biol. 188: 809-20.](#)

25. Omri, S. *et al.* (2010) The outer limiting membrane (OLM) revisited: clinical implications. [Clin Ophthalmol. 4: 183-95.](#)
26. Wallace, S.W. *et al.* (2010) Cdc42 regulates apical junction formation in human bronchial epithelial cells through PAK4 and Par6B. [Mol Biol Cell. 21 \(17\): 2996-3006.](#)
27. Abe, Y. *et al.* (2010) A single starfish Aurora kinase performs the combined functions of Aurora-A and Aurora-B in human cells. [J Cell Sci. 123: 3978-88.](#)
28. Bruce, E.A. *et al.* (2010) The Rab11 pathway is required for influenza A virus budding and filament formation. [J Virol. 84: 5848-59.](#)
29. Zenner, H.L. *et al.* (2011) Analysis of Rab GTPase-Activating Proteins Indicates that Rab1a/b and Rab43 Are Important for Herpes Simplex Virus 1 Secondary Envelopment. [J Virol. 85: 8012-21.](#)
30. Wise, H.M. *et al.* (2011) Overlapping signals for translational regulation and packaging of influenza A virus segment 2. [Nucleic Acids Res. 39: 7775-90.](#)
31. Cheishvili, D. *et al.* (2011) Involvement in Cytoskeleton Regulation and Implication for Familial Dysautonomia. [Hum Mol Genet. 20: 1585-94.](#)
32. Wise, H.M. *et al.* (2011) Overlapping signals for translational regulation and packaging of influenza A virus segment 2. [Nucleic Acids Res. 39 \(17\): 7775-90.](#)
33. Stadler, L.K. *et al.* (2011) Structure-function studies of an engineered scaffold protein derived from Stefin A. II: Development and applications of the SQT variant. [Protein Eng Des Sel. 24 \(9\): 751-63.](#)
34. Morishita, D. *et al.* (2011) Cell-permeable carboxyl-terminal p27(Kip1) peptide exhibits anti-tumor activity by inhibiting Pim-1 kinase. [J Biol Chem. 286: 2681-8.](#)
35. Timm, T. *et al.* (2011) Microtubule affinity regulating kinase (MARK) activity in living neurons examined by a genetically encoded FRET/FLIM based biosensor: Inhibitors with therapeutic potential. [J Biol Chem. 286: 41711-22.](#)
36. Wise, H.M. *et al.* (2012) Identification of a novel splice variant form of the influenza A virus M2 ion channel with an antigenically distinct ectodomain. [PLoS Pathog. 8\(11\): e1002998.](#)
37. Vafopoulou, X. & Steel, C.G. (2012) Cytoplasmic travels of the ecdysteroid receptor in target cells: pathways for both genomic and non-genomic actions. [Front Endocrinol \(Lausanne\). 3: 43.](#)
38. Dayraud, C. *et al.* (2012) Independent specialisation of myosin II paralogues in muscle vs. non-muscle functions during early animal evolution: a ctenophore perspective. [BMC Evol Biol. 12: 107.](#)
39. Courtois, A. *et al.* (2012) The transition from meiotic to mitotic spindle assembly is gradual during early mammalian development. [J Cell Biol. 198: 357-70.](#)
40. Virágh, E. *et al.* (2012) Specific Cooperation Between Imp- α 2 and Imp- β /Ketel in Spindle Assembly During Drosophila Early Nuclear Divisions. [G3 \(Bethesda\). 2 \(1\): 1-14.](#)
41. Meseroll, R.A. *et al.* (2012) Septin ring size scaling and dynamics require the coiled-coil region of Shs1p. [Mol Biol Cell. 23: 3391-406.](#)
42. Bodor, D.L. *et al.* (2013) Assembly in G1 phase and long-term stability are unique intrinsic features of CENP-A nucleosomes. [Mol Biol Cell. 24: 923-32.](#)
43. Feau, S. *et al.* (2013) SLAT Regulates CD8+ T Cell Clonal Expansion in a Cdc42- and NFAT1-Dependent Manner. [J Immunol. 190: 174-83.](#)
44. De Faveri, L.E. *et al.* (2013) Putative tumour suppressor gene necdin is hypermethylated and mutated in human cancer. [Br J Cancer. 108: 1368-77.](#)
45. Liz, M.A. *et al.* (2014) Neuronal deletion of GSK3 β increases microtubule speed in the

- growth cone and enhances axon regeneration via CRMP-2 and independently of MAP1B and CLASP2. [BMC Biol. 12: 47.](#)
46. Levy, G.V. *et al.* (2015) Depletion of the SR-Related Protein TbRRM1 Leads to Cell Cycle Arrest and Apoptosis-Like Death in *Trypanosoma brucei*. [PLoS One. 10 \(8\): e0136070.](#)
47. Nunan, R. *et al.* (2015) Ephrin-Bs Drive Junctional Downregulation and Actin Stress Fiber Disassembly to Enable Wound Re-epithelialization. [Cell Rep. 13 \(7\): 1380-95.](#)
48. Koparir, A. *et al.* (2015) Novel POC1A mutation in primordial dwarfism reveals new insights for centriole biogenesis. [Hum Mol Genet. 24 \(19\): 5378-87.](#)
49. Gaudet, A.D. *et al.* (2015) Galectin-1 in injured rat spinal cord: implications for macrophage phagocytosis and neural repair. [Mol Cell Neurosci. 64: 84-94.](#)
50. Jonasson, E.M. *et al.* (2016) Zds1/Zds2-PP2ACdc55 complex specifies signaling output from Rho1 GTPase. [J Cell Biol. 212 \(1\): 51-61.](#)
51. Gholkar, A.A. *et al.* (2016) Fatostatin Inhibits Cancer Cell Proliferation by Affecting Mitotic Microtubule Spindle Assembly and Cell Division. [J Biol Chem. 291 \(33\): 17001-8.](#)
52. Kono, K. *et al.* (2016) Plasma membrane/cell wall perturbation activates a novel cell cycle checkpoint during G1 in *Saccharomyces cerevisiae*. [Proc Natl Acad Sci U S A. 113 \(25\): 6910-5.](#)
53. Schlicher, L. *et al.* (2016) SPATA2 promotes CYLD activity and regulates TNF-induced NF- κ B signaling and cell death. [EMBO Rep. 17 \(10\): 1485-97.](#)
54. Vargas, P. *et al.* (2016) Innate control of actin nucleation determines two distinct migration behaviours in dendritic cells. [Nat Cell Biol. 18 \(1\): 43-53.](#)
55. Turnbull, M.L. *et al.* (2016) Role of the B Allele of Influenza A Virus Segment 8 in Setting Mammalian Host Range and Pathogenicity. [J Virol. 90 \(20\): 9263-84.](#)
56. Vafopoulou, X. & Steel, C.G.H. (2016) Mitochondria and the insect steroid hormone receptor (EcR): A complex relationship. [Gen Comp Endocrinol. 237: 68-77.](#)
57. Zasadil, L.M. *et al.* (2016) High rates of chromosome missegregation suppress tumor progression but do not inhibit tumor initiation. [Mol Biol Cell. 27 \(13\): 1981-9.](#)
58. Iwasaki, D. *et al.* (2016) The MRX Complex Ensures NHEJ Fidelity through Multiple Pathways Including Xrs2-FHA-Dependent Tel1 Activation. [PLoS Genet. 12 \(3\): e1005942.](#)
59. Kerr, G.W. *et al.* (2016) PP2A(Cdc55)'s role in reductional chromosome segregation during achiasmate meiosis in budding yeast is independent of its FEAR function. [Sci Rep. 6: 30397.](#)
60. Takáč, T. *et al.* (2017) Actin depolymerization-induced changes in proteome of *Arabidopsis* roots. [J Proteomics. 153: 89-99.](#)
61. Gao, L. *et al.* (2017) Afadin orients cell division to position the tubule lumen in developing renal tubules. [Development. 144 \(19\): 3511-20.](#)
62. Klinger, P. *et al.* (2017) PEDF Is Associated with the Termination of Chondrocyte Phenotype and Catabolism of Cartilage Tissue. [Biomed Res Int. 2017: 7183516.](#)
63. Inoue, D. *et al.* (2019) Actin filaments regulate microtubule growth at the centrosome. [EMBO J. 38\(11\): e99630.](#)
64. Norekian, T.P. & Moroz, L.L. (2019) Neural system and receptor diversity in the ctenophore *Beroë abyssicola*. [J Comp Neurol. 527 \(12\): 1986-2008.](#)
65. Sawicki, M.P. *et al.* (2019) Menin Associates With the Mitotic Spindle and Is Important for Cell Division. [Endocrinology. 160 \(8\): 1926-36.](#)
66. Norekian, T.P. & Moroz, L.L. (2019) Neuromuscular organization of the Ctenophore *Pleurobrachia bachei*. [J Comp Neurol. 527 \(2\): 406-36.](#)

67. Patteson, A.E. *et al.* (2019) Loss of Vimentin Enhances Cell Motility through Small Confining Spaces. [Small. 15 \(50\): e1903180.](#)
68. Hughes, S.E. *et al.* (2019) The E3 ubiquitin ligase Sina regulates the assembly and disassembly of the synaptonemal complex in *Drosophila*. females. [PLoS Genet. 15 \(5\): e1008161.](#)
69. Soday, L. *et al.* (2019) Quantitative Temporal Proteomic Analysis of Vaccinia Virus Infection Reveals Regulation of Histone Deacetylases by an Interferon Antagonist. [Cell Rep. 27 \(6\): 1920-1933.e7.](#)
70. Bernkopf, D.B. *et al.* (2019) An aggregon in conductin/axin2 regulates Wnt/ β -catenin signaling and holds potential for cancer therapy. [Nat Commun. 10 \(1\): 4251.](#)
71. Lee, D.K. *et al.* (2019) Cdk5 regulates N-cadherin-dependent neuronal migration during cortical development. [Biochem Biophys Res Commun. 514 \(3\): 645-52.](#)
72. Montesinos, J.C. *et al.* (2020) Phytohormone cytokinin guides microtubule dynamics during cell progression from proliferative to differentiated stage. [EMBO J. 39 \(17\): e104238.](#)
73. Garrido, D. *et al.* (2020) Cyclin B3 activates the Anaphase-Promoting Complex/Cyclosome in meiosis and mitosis. [PLoS Genet. 16 \(11\): e1009184.](#)
74. Norekian, T.P. & Moroz, L.L. (2020) Comparative neuroanatomy of ctenophores: Neural and muscular systems in *Euplokamis dunlapae* and related species. [J Comp Neurol. 528 \(3\): 481-501.](#)
75. Norekian, T.P. & Moroz, L.L. (2020) Atlas of the neuromuscular system in the *Trachymedusa aglantha digitale*: Insights from the advanced hydrozoan. [J Comp Neurol. 528 \(7\): 1231-54.](#)
76. Gallaud, E. *et al.* (2020) Dynamic centriolar localization of Polo and Centrobin in early mitosis primes centrosome asymmetry. [PLoS Biol. 18 \(8\): e3000762.](#)
77. Norekian, T.P. & Moroz, L.L. (2021) Development of the nervous system in the early hatching larvae of the ctenophore *Mnemiopsis leidyi*. [J Morphol. 282 \(10\): 1466-1477.](#)
78. Iida, T. & Kobayashi, T. (2021) Establishment of an "in saccharo" experimental system. [Genes Genet Syst. 96 \(3\): 107-18.](#)
79. Capitao, C. *et al.* (2021) A CENH3 mutation promotes meiotic exit and restores fertility in SMG7-deficient *Arabidopsis*. [PLoS Genet. 17 \(9\): e1009779.](#)
80. Sprenger, M. *et al.* (2021) A TRP1-marker-based system for gene complementation, overexpression, reporter gene expression and gene modification in *Candida glabrata*. [FEMS Yeast Res. 20\(8\):foaa066.](#)
81. Garcia, Y.A. *et al.* (2021) Mapping Proximity Associations of Core Spindle Assembly Checkpoint Proteins. [J Proteome Res. 20 \(7\): 3414-27.](#)
82. Linville, A.C. *et al.* (2022) Dysregulation of Cellular VRK1, BAF, and Innate Immune Signaling by the Vaccinia Virus B12 Pseudokinase. [J Virol. : e0039822.](#)
83. Mieter, C. *et al.* (2022) Gai2-induced conductin/axin2 condensates inhibit Wnt/ β -catenin signaling and suppress cancer growth. [Nat Commun. 13 \(1\): 674.](#)
84. Carnesecchi, J. *et al.* (2022) The Hox transcription factor Ultrabithorax binds RNA and regulates co-transcriptional splicing through an interplay with RNA polymerase II. [Nucleic Acids Res. 50 \(2\): 763-783.](#)
85. Yuen, S.W. *et al.* (2023) Polo-like kinase 1 promotes Cdc42-induced actin polymerization for asymmetric division in oocytes [Open Biology. 13 \(3\): 220326.](#)

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: https://www.bio-rad-antibodies.com/SDS/MCA77G 10040
--------------------------------------	--

Regulatory	For research purposes only
-------------------	----------------------------

Related Products

Recommended Secondary Antibodies

Rabbit Anti Rat IgG (STAR16...)	DyLight@800
Rabbit Anti Rat IgG (STAR17...)	FITC
Goat Anti Rat IgG (STAR72...)	HRP
Goat Anti Rat IgG (STAR69...)	FITC
Goat Anti Rat IgG (STAR73...)	RPE
Rabbit Anti Rat IgG (STAR21...)	HRP
Goat Anti Rat IgG (MOUSE ADSORBED) (STAR71...)	DyLight@550 , DyLight@650 , DyLight@800
Goat Anti Rat IgG (STAR131...)	Alk. Phos. , Biotin

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)

'M381496:210512'

Printed on 04 Jun 2024