

## Alexa Fluor® 488 anti-Tubulin $\beta$ 3 (TUBB3) Antibody (Previously Covance catalog# A488-435L)

<b>Catalog# / Size</b>	801203 / 100 $\mu$ L
<b>Clone</b>	TUJ1
<b>Regulatory Status</b>	RUO
<b>Other Names</b>	CDCBM, CDCBM1, CFEOM3, CFEOM3A, FEOM3, TUBB4, Tubulin beta-3 chain, tubulin beta-III, tubulin beta-4 chain, class III beta-tubulin
<b>Previously</b>	Covance Catalog# A488-435L
<b>Isotype</b>	Mouse IgG2a, $\kappa$
<b>Description</b>	Tubulin is the main component of microtubules. In adults, tubulin beta 3 (TUBB3) is primarily expressed in neurons and is commonly used as a neuronal marker. It plays an important role in neuronal cell proliferation and differentiation. Mutations in this gene cause congenital fibrosis of the type 3 extraocular muscles. Tubulin beta 3 (TUBB3) is also found in a wide range of tumors. Studies indicate that it is a predictive and prognostic marker in various tumors.

### Product Details

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<b>Verified Reactivity</b>	Human, Mouse, Rat
<b>Antibody Type</b>	Monoclonal
<b>Host Species</b>	Mouse
<b>Immunogen</b>	This antibody was raised against microtubules derived from rat brain.
<b>Formulation</b>	Alexa Fluor® Labeled Antibody (in PBS + 50% glycerol + 0.03% thimerosal).
<b>Concentration</b>	1.0 mg/ml
<b>Storage &amp; Handling</b>	The antibody solution should be stored undiluted between 2°C and 8°C, and protected from prolonged exposure to light. <b>Do not freeze.</b>
<b>Application</b>	<a href="#">ICC - Quality tested</a> <a href="#">IHC-P, ICFC, 3D IHC - Verified</a> <a href="#">SB - Reported in the literature, not verified in house</a>
<b>Recommended Usage</b>	Each lot of this antibody is quality control tested by immunocytochemistry. For immunocytochemistry, a dilution of 1:500 is recommended. For immunohistochemistry, a concentration range of 1.0 - 5.0 $\mu$ g/ml is suggested. For flow cytometric staining, the suggested use of this reagent is 5 $\mu$ L per million cells in 100 $\mu$ L staining volume or 5 $\mu$ L per 100 $\mu$ L of whole blood. For 3D immunohistochemistry on formalin-fixed tissues, a concentration of 5.0 $\mu$ g/mL is suggested. It is recommended that the reagent be titrated for optimal performance for each application.  Alexa Fluor® and Pacific Blue™ are trademarks of Life Technologies Corporation.  <a href="#">View full statement regarding label licenses</a>
<b>Excitation Laser</b>	Blue Laser (488 nm)
<b>Application Notes</b>	Additional reported applications (for the relevant formats) include: flow cytometry <sup>4</sup> , immunofluorescence microscopy <sup>1-5,7</sup> , immunohistochemistry <sup>5,7</sup> , Western blotting <sup>8</sup> , and spatial biology (IBEX) <sup>9,10</sup> .  This antibody is well characterized and highly reactive to neuron specific Class III $\beta$ -tubulin ( $\beta$ III). TUJ1 does not identify $\beta$ -tubulin found in glial cells. TUJ1 recognizes an epitope located within the last 15 C-terminal residues <sup>8</sup> .
<b>Additional Product Notes</b>	Iterative Bleaching Extended multi-plexity (IBEX) is a fluorescent imaging technique capable of highly-multiplexed spatial analysis. The method relies on cyclical bleaching of panels of fluorescent

antibodies in order to image and analyze many markers over multiple cycles of staining, imaging, and, bleaching. It is a community-developed open-access method developed by the Center for Advanced Tissue Imaging (CAT-I) in the National Institute of Allergy and Infectious Diseases (NIAID, NIH).

#### Application References

(PubMed link indicates BioLegend citation)

1. Nishimura K, *et al.* 2017. *PLoS One*. 12(1): e0170568. (ICC)
2. Jongbloets J, *et al.* 2017. *Nat Commun*. 8: 14666. (ICC) [PubMed](#)
3. Liu W.J, *et al.* 2015. *Eur J Histochem*. 59(1): 2464. (ICC) [PubMed](#)
4. Chintalapudi SR, *et al.* 2016. *Front Aging Neurosci*. 8:93. (FC, ICC) [PubMed](#)
5. Ambasadhan R, *et al.* 2011. *Cell Stem Cell*. 9(2):113. (IHC, ICC)
6. Hu X, *et al.* 2006. *Nature Neurosci*. 9(12):1520. (WB) [PubMed](#)
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8. Lee MK, *et al.* 1990. *Proc. Natl. Acad. Sci. USA* 18:7195. (WB)
9. Radtke AJ, *et al.* 2020. *Proc Natl Acad Sci USA*. 117:33455-33465. (SB) [PubMed](#)
10. Radtke AJ, *et al.* 2022. *Nat Protoc*. 17:378-401. (SB) [PubMed](#)

#### Product Citations

1. Babetto E, *et al.* 2020. *Nat Neurosci*. 23:1215. [PubMed](#)
2. McCurdy EP *et al.* 2019. *Cell Rep*. 29(2):363-377. [PubMed](#)
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12. Larhammar M *et al.* 2017. *eLife*. 6 pii: e20725. [PubMed](#)
13. Jalilian E, *et al.* 2022. *Stem Cell Res Ther*. 13:425. [PubMed](#)
14. Chen M, *et al.* 2019. *Cell Stem Cell*. 25:501. [PubMed](#)
15. Martínez JC *et al.* 2019. *Neuron*. 104(5):931-946. [PubMed](#)
16. Geisler S, *et al.* 2019. *JCI Insight*. 4:e129920. [PubMed](#)
17. Žiak J, *et al.* 2020. *EMBO Rep*. e48512:21. [PubMed](#)
18. Chung KM, *et al.* 2022. *Cell Rep*. 41:111488. [PubMed](#)

RRID AB\_2564757 (BioLegend Cat. No. 801203)

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## Antigen Details

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<b>Structure</b>	Tubulin $\beta$ 3 is a 450 amino acid protein with a molecular mass of ~50 kD.
<b>Distribution</b>	Tissue distribution: central and peripheral nervous system. Cellular distribution: cytosol, cytoskeleton and nucleus.
<b>Function</b>	Tubulin $\beta$ 3 is the major constituent of microtubules, and plays a critical role in proper axon guidance and maintenance.
<b>Interaction</b>	Alpha tubulin, kinesin and dynein.
<b>Cell Type</b>	Mature Neurons, Neural Stem Cells
<b>Biology Area</b>	Cell Biology, Neuroscience, Neuroscience Cell Markers, Stem Cells
<b>Molecular Family</b>	Microtubules
<b>Antigen References</b>	<ol style="list-style-type: none"><li>1. Zhao X, <i>et al.</i> 2017. <i>Med Sci Monit</i>. 22: 3915.</li><li>2. Lebok P, <i>et al.</i> 2016. <i>Oncol Lett</i>. 11(3):1987.</li><li>3. Du J, <i>et al.</i> 2015. <i>BMC Cancer</i>. 15:536. <a href="#">PubMed</a></li><li>4. Rouge DM., <i>et al.</i> 2013. <i>Clin Exp Metastasis</i>. 31(1): 101.</li><li>5. Ploussard G, <i>et al.</i> 2010. <i>Cancer Res</i>. 70(22):9253. <a href="#">PubMed</a></li></ol>
<b>Gene ID</b>	<a href="#">10381</a>

## Related Protocols

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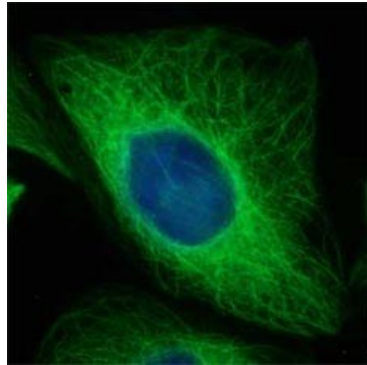
[Immunocytochemistry Staining Protocol](#)

[Intracellular Flow Cytometry Staining Protocol](#)

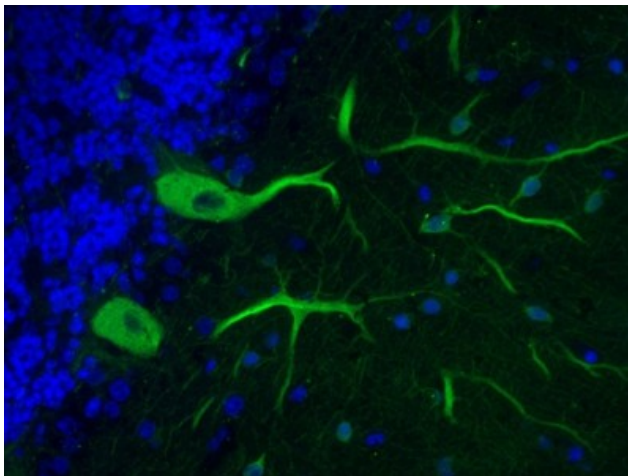
## Other Formats

Alexa Fluor® 488 anti-Tubulin  $\beta$  3 (TUBB3), Purified anti-Tubulin  $\beta$  3 (TUBB3), Alexa Fluor® 594 anti-Tubulin  $\beta$  3 (TUBB3), Alexa Fluor® 647 anti-Tubulin  $\beta$  3 (TUBB3), HRP anti-Tubulin  $\beta$  3 (TUBB3), Biotin anti-Tubulin  $\beta$  3 (TUBB3), APC anti-Tubulin  $\beta$  3 (TUBB3), PE/Cyanine7 anti-Tubulin  $\beta$  3 (TUBB3), PerCP/Cyanine5.5 anti-Tubulin  $\beta$  3 (TUBB3), PE anti-Tubulin  $\beta$  3 (TUBB3)

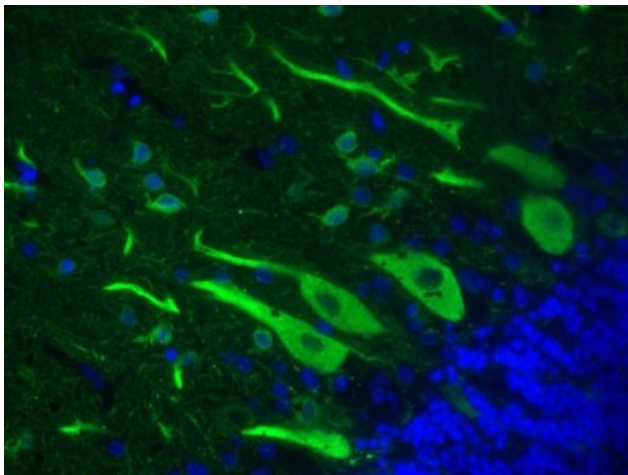
## Product Data



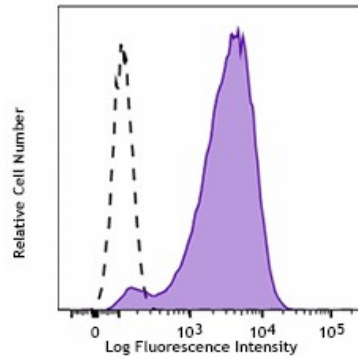
CHO cell line expressing Tubulin  $\beta$  3 stained with Alexa Fluor® 488 anti-Tubulin  $\beta$  3.



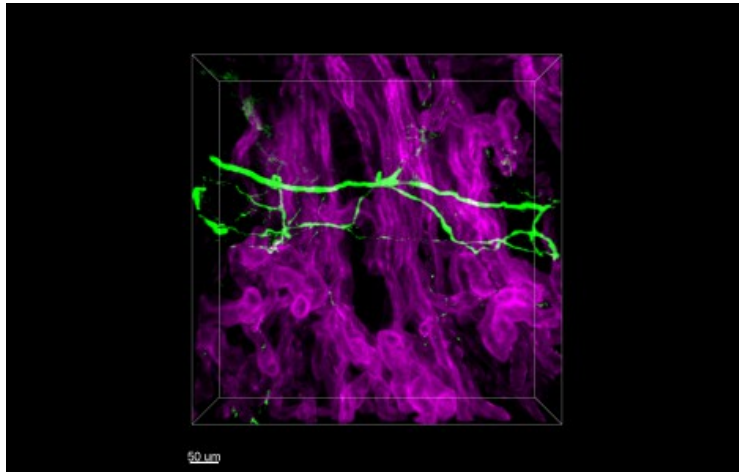
IHC staining of Alexa Fluor® 488 anti-Tubulin  $\beta$  3 (TUBB3) antibody (clone TUJ1) on formalin-fixed paraffin-embedded human cerebellum tissue. Following antigen retrieval using Sodium Citrate H.I.E.R., the tissue was incubated with 5  $\mu$ g/ml of the primary antibody for 60 minutes at room temperature. The image was captured with a 40X objective.



IHC staining of Alexa Fluor® 488 anti-Tubulin  $\beta$  3 (TUBB3) antibody (Clone TUJ1) on formalin-fixed paraffin-embedded normal human cerebellum tissue. Following antigen retrieval using Sodium Citrate H.I.E.R., the tissue was incubated with 1  $\mu$ g/ml of the primary antibody for 60 minutes at room temperature. The image was captured with a 40X objective.

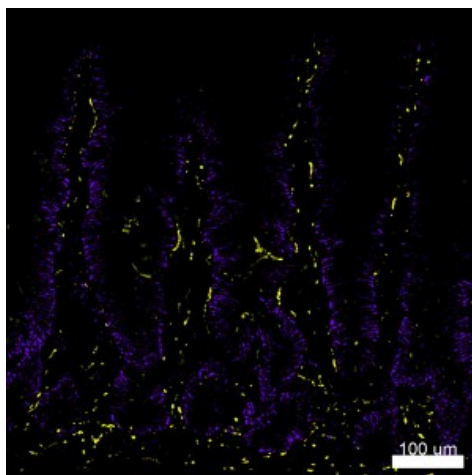


Human lung adenocarcinoma cell line A549 was treated with Fixation Buffer (Cat# 420801) and Permeabilization Wash Buffer (Cat# 421002), and then stained with TUBB3 (clone TUJ1) Alexa Fluor® 488 (filled histogram) or mouse IgG2a, κ Alexa Fluor® 488 isotype control (open histogram).



Paraformaldehyde-fixed (4%), 500 μm-thick mouse kidney tissue section was processed according to the Ce3DTM Tissue Clearing Kit protocol (cat. no. 427701). The section was costained with anti-Tubulin β 3 (TUBB3) Antibody (clone TUJ1) Alexa Fluor® 488 at 5 μg/mL (green), and anti-mouse CD326 (Ep-CAM) Antibody (clone G8.8) Alexa Fluor® 594 at 5 μg/mL (magenta). The section was then optically cleared and mounted in a sample chamber. The image was captured with a 20X objective using Zeiss 780 confocal microscope and processed by Imaris image analysis software.

[Watch the video.](#)



Confocal image of human jejunum sample acquired using the IBEX method of highly multiplexed antibody-based imaging: β-tubulin 3 (yellow) in Cycle 3 and CD138 (purple) in Cycle 5. Tissues were prepared using ~1% (vol/vol) formaldehyde and a detergent. Following fixation, samples are immersed in 30% (wt/vol) sucrose for cryoprotection. Images are courtesy of Drs. Andrea J. Radtke and Ronald N. Germain of the Center for Advanced Tissue Imaging (CAT-I) in the National Institute of Allergy and Infectious Diseases (NIAID, NIH).

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