abcam

ab7751

Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker

Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751) is a mouse monoclonal antibody detecting beta III Tubulin in **Western Blot, Flow Cytometry (Intra), IHC-P, ICC/IF**. Suitable for **Human, Mouse**.

- Over 190 publications
- Trusted since 2002

Lab Essentials

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	pH: 7.4 Preservative: 0.097% Sodium azide Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	Synthetic Peptide within Human TUBB3 aa 400-450 conjugated to Keyhole Limpet Haemocyanin. The exact immunogen used to generate this antibody is proprietary information. Database link Q13509
Clone number	TU-20
Purification technique	Affinity purification Protein A
Specificity	Class III beta-tubulin specific for neurons.
Epitope	ESESQGPK (aa 441-448)
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →
Purification notes	Purity >95% by SDS-PAGE.

Reactivity data

ICC/IF

Tested

Species	Mouse
Dilution info	1/1000
Notes	-

Expected

Species	Human
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mammals
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	1-2 µg/mL
Notes	We suggest reducing conditions and a 90 minute incubation time.

Expected

Species	Mouse
Dilution info	Use at an assay dependent concentration.

Notes	-

Predicted

Species	Mammals
Dilution info	-
Notes	-

IHC-P

Tested

Species	Human
Dilution info	10 µg/mL
Notes	-

Expected

Species	Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mammals
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/20 - 1/50
Notes	ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Expected

Species	Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mammals
Dilution info	-
Notes	-

Target data

See full target information TUBB3

Function Tubulin is the major constituent of microtubules, protein filaments consisting of alpha- and beta-tubulin heterodimers (PubMed:34996871, PubMed:38305685, PubMed:38609661). Microtubules grow by the addition of GTP-tubulin dimers to the microtubule end, where a stabilizing cap forms (PubMed:34996871, PubMed:38305685, PubMed:38609661). Below the cap, alpha-beta tubulin heterodimers are in GDP-bound state, owing to GTPase activity of alpha-tubulin (PubMed:34996871, PubMed:38609661). TUBB3 plays a critical role in proper axon guidance and maintenance (PubMed:20074521). Binding of NTN1/Netrin-1 to its receptor UNC5C might cause dissociation of UNC5C from polymerized TUBB3 in microtubules and thereby lead to increased microtubule dynamics and axon repulsion (PubMed:28483977). Plays a role in dorsal root ganglion axon projection towards the spinal cord (PubMed:28483977).

Storage

Shipped at conditions	Blue Ice
Appropriate short-term storage duration	1-2 weeks
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot

Storage information	Avoid freeze / thaw cycle

Notes

What is this antibody validated in?
Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751) is a mouse monoclonal antibody and is validated for use in Western Blot (WB), Flow Cytometry (Intra), Immunohistochemistry (IHC-P), Immunocytochemistry/immunofluorescence (ICC/IF) in Human, Mouse samples.

Trusted by the scientific community
Anti-beta III Tubulin [TU-20] - Neuronal Marker (ab7751) was first used in a scientific publication in 2002 and has been cited over 190 times in peer-reviewed journals.

Reviewed by scientists
Anti-beta III Tubulin [TU-20] - Neuronal Marker (ab7751) has over 20 independent reviews from customers.

Other related products
We have a range of other formats of antibody clone [TU-20] also available for your convenience: ab7751, FITC - ab25770

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	Beta III tubulin often referred to as BIII tubulin or beta-tubulin 3 is a microtubule element involved in the cellular cytoskeleton structure. This protein with a molecular mass of approximately 55 kDa plays an important role in the development and maintenance of neuron structures. It is most prominently expressed in neurons within the central and peripheral nervous systems. In these cells beta III tubulin contributes to microtubule polymerization facilitating the formation of the intricate network necessary for cell shape intracellular transport and division.
Biological function summary	Beta III tubulin acts in stabilizing microtubules which are essential for proper neuronal function. It exists as part of the tubulin dimer complex partnering with alpha-tubulin to form the building blocks of microtubules. This particular isotype is often used as a marker for neuronal differentiation due to its specific expression pattern in neural tissues. Its regulation and expression levels are important for neurogenesis and maintaining neuronal plasticity.
Pathways	Beta III tubulin plays a role in neuron-specific intracellular transport and signaling pathways like the Rho GTPase and MAPK signaling pathways. These pathways are involved in cell cycle regulation and apoptotic processes. Relationships with other proteins such as kinesins and dyneins are important in these pathways influencing intracellular transport and signaling through binding and moving along the microtubule tracks created by beta-tubulin isotypes including beta III tubulin.

Associated diseases and disorders	Abnormal beta III tubulin expression has been associated with cancer particularly in tumors originating from neuronal lineage such as glioblastomas. Overexpression or mutations can contribute to chemoresistance complicating treatment for certain types of cancer. Beta III tubulin is also linked to neurodevelopmental disorders as it affects proper neural network formation and stability. Its relationship with tumor protein p53 is noted in cancer pathways as p53 can influence beta III tubulin expression impacting cellular proliferation and apoptosis in oncogenic processes.

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

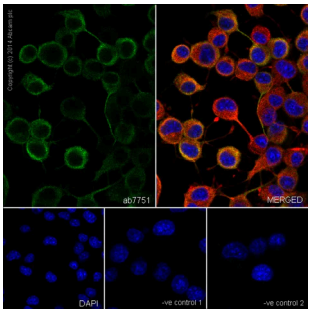
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

13 product images

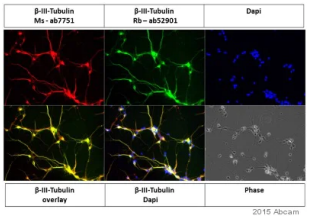


Immunocytochemistry/ Immunofluorescence - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunocytochemistry/ Immunofluorescence staining using mouse Anti-beta III Tubulin antibody

ab7751 staining beta III Tubulin in Neuro-2a (Mouse neuroblastoma cell line) cells.
The cells were fixed with 100% methanol (5min) and then blocked in 1% BSA/10% normal goat serum/0.3M glycine in 0.1%PBS-Tween for 1h. The cells were then incubated with ab7751 at 1/1000 and ab6046 at 1µg/ml overnight at +4°C, followed by a further incubation at room temperature for 1h with an AlexaFluor®488 Goat anti-Mouse secondary (ab150117) at 2 µg/ml

(shown in green) and AlexaFluor®594 Goat anti-Rabbit secondary (ab150088) at 2 µg/ml (shown in pseudo color red). Nuclear DNA was labeled in blue with DAPI.
Negative controls: 1– Rabbit primary and anti-mouse secondary antibody; 2 – Mouse primary antibody and anti-rabbit secondary antibody. Controls 1 and 2 indicate that there is no unspecific reaction between primary and secondary antibodies used.

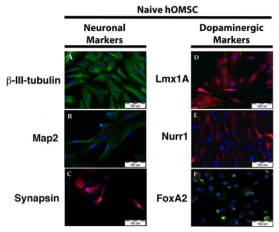


This image is courtesy of an anonymous customer review

Immunocytochemistry/ Immunofluorescence - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunocytochemistry/ Immunofluorescence staining using mouse Anti-beta III Tubulin antibody

ab7751 staining beta III Tubulin in induced neurons derived from human pluripotent cells by ICC (Immunocytochemistry).
Cells were fixed with paraformaldehyde, permeabilized with 0.25% Triton X-100 in PBS and blocked with 1% BSA for 30 minutes at 22°C. Samples were incubated with primary antibody (1/500) for 16 hours at 4°C. An Alexa Fluor® 594-conjugated Donkey anti-mouse IgG polyclonal (1/1000) was used as the secondary antibody.



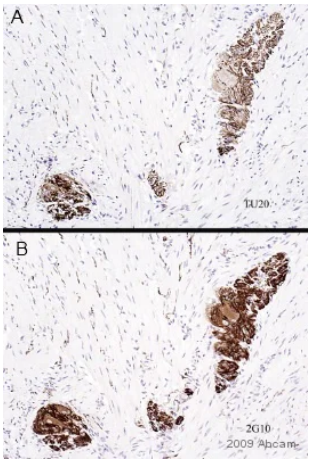
Ganz et al PLoS One. 2014 Jun 19;9(6):e100445. doi: 10.1371/journal.pone.0100445. eCollection 2014. Fig 1. Reproduced under the Creative Commons license http://creativecommons.org/licenses/by/4.0/

Immunocytochemistry - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Naive hOMSC express constitutively neuronal and dopaminergic markers.
Immunofluorescence of neuronal (A–C) and dopaminergic (D–F) markers in naïve hOMSC, scale bars 100 µM.

Cells obtained from two donors (24 and 35 years old) were fixed in 4% PFA-PBS and pre-incubated for 60 min in blocking solution (5% goat serum, 1% BSA, 0.05% Triton-X in PBS). Primary antibodies were diluted in the blocking solution and applied overnight at 4°C. The following primary antibodies were used, β-III-Tubulin (1⊠200, ab7751, abcam), Map2 (1⊠200), synapsin (1⊠200), tyrosine hydroxylase (1⊠200), Lmx1A (1⊠200), Pitx3 (1⊠200) and Nurr1 (1⊠200).

Primary antibodies were detected with fluorescent-labeled secondary antibodies Alexa®488 and 568 (1⊠500,) for 1 h at room temperature. Nuclear DNA was stained using 4,6-diamino-2-phenylindole (DAPI) (1⊠1000).

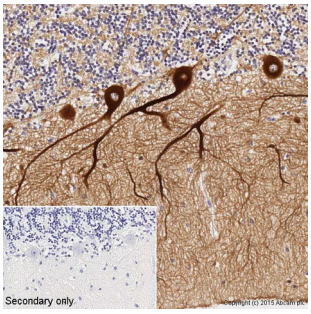


This image is courtesy of a customer review submitted by Carl Hobbs,

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-beta III Tubulin antibody

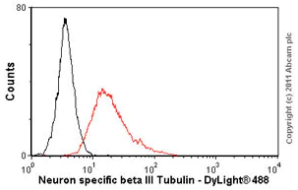
ab7751 staining neuron specific beta III Tubulin in human colon tissue sections by Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections).
Tissue underwent formaldehyde fixation before heat mediated antigen retrieval in citric acid pH 6 and then blocking with 1% BSA was performed for 10 minutes at RT. The primary antibody was used at dilution at 1/200 and incubated with sample in TBS/BSA/azide for 2 hours. A biotin conjugated goat polyclonal to mouse IgG was used at dilution at 1/200 as secondary antibody. Images A and B represent staining of the clone TU20 and 2G10 respectively in ganglia of Auerbach's plexus.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-beta III Tubulin antibody

IHC image of ab7751 staining beta III Tubulin in human cerebellum formalin fixed paraffin embedded tissue sections, performed on a Leica Bond.
The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH 6, epitope retrieval solution 1) for 20 mins. The section was then incubated with ab7751, 5µg/ml, for 15 mins at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with hematoxylin and mounted with DPX. No primary antibody was used in the secondary only control (shown on the inset).
For other IHC staining systems (automated and non-automated) customers should optimize variable parameters such as antigen retrieval conditions, primary antibody concentration and antibody incubation times.

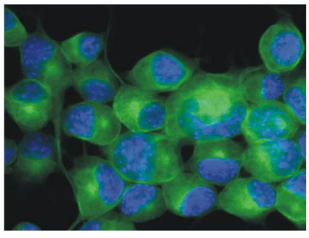


Flow Cytometry (Intracellular) - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Flow Cytometry (Intracellular) staining using mouse Anti-beta III Tubulin antibody

Overlay histogram showing SH-SY5Y (Human neuroblastoma cell line from bone marrow) cells stained with ab7751 (red line).
The cells were fixed with 4% paraformaldehyde (10 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab7751, 1/50 dilution) for 30 min at 22°C. The secondary antibody used was DyLight® 488 goat anti-mouse IgG (H+L) (ab96879) at 1/500 dilution for 30 min at 22°C. Isotype control antibody (black line) was mouse IgG1 [ICIGG1] (ab91353, 2µg/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was performed.

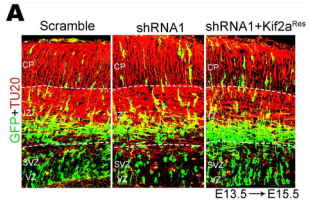
This antibody gave a positive signal in SH-SY5Y cells fixed with 80% methanol (5 min)/permeabilized in 0.1% PBS-Tween used under the same conditions.



Immunocytochemistry/ Immunofluorescence - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunocytochemistry/ Immunofluorescence staining using mouse Anti-beta III Tubulin antibody

Immunocytochemistry staining of mouse Neuro2a cells (neuroblast/neuronal and amoeboid stem cells) using 3µg/ml ab7751 (green), nuclear counterstaining with DAPI (blue).



Sun et al PLoS One. 2017 Jun 7;12(6):e0179047. doi: 10.1371/journal.pone.0179047. eCollection 2017. Fig 5. Reproduced under the Creative Commons license http://creativecommons.org/licenses/by/4.0/

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-beta III Tubulin antibody

Kif2a is involved in the differentiation of NSCs/NPCs.
(Panel A) Mouse embryos were electroporated with indicated plasmids (scramble shRNA, Kif2a shRNA1 or Kif2a shRNA1+Kif2a^{Res}) at E13.5, and analyzed at E15.5. GFP (green) represents cells expressing the indicated plasmids; TU20 (ab7751, red) represents immature neurons. Scale bars = 50 μm.

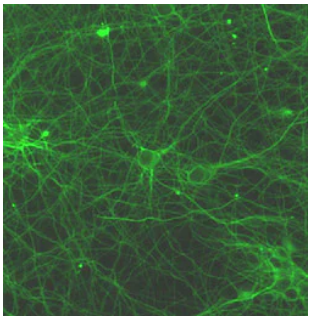
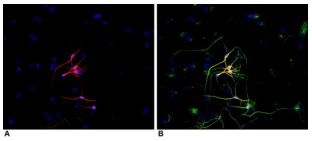


Photo courtesy of QBMCellScience

Immunocytochemistry/ Immunofluorescence - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunocytochemistry/ Immunofluorescence staining using mouse Anti-beta III Tubulin antibody

ab7751 immunostaining (1/500) neuronal processes in primary mouse cortical culture.

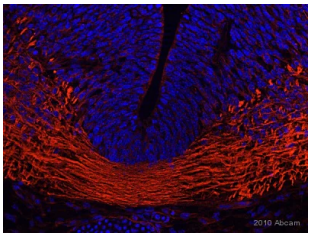


Immunocytochemistry/ Immunofluorescence - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunocytochemistry/ Immunofluorescence staining using mouse Anti-beta III Tubulin antibody

Immunocytochemistry staining of mouse P-19 cells (embryonal carcinoma).
A: Microtubules stained with neuron-specific ab7751 in red.

B: Merged image of co-staining with ab7751 and anti-beta-tubulin.



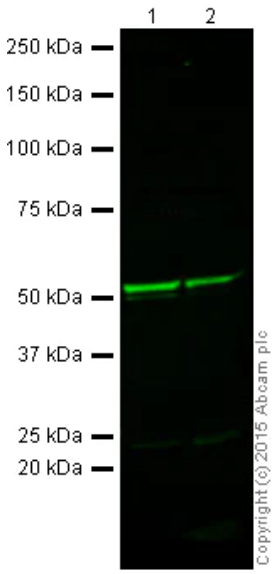
This image is courtesy of a customer review submitted by Carl Hobbs, King's College London, United Kingdom

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-beta III Tubulin antibody

Immunohistochemistical detection of neuron specific beta III Tubulin using antibody (ab7751) on whole mouse e12 embryo (formaldehyde fixed/frozen sections).
Permeabilization: No. Blocking step: 1% BSA for 10 mins @ rt°C. Primary Antibody Dilution 1/200; Incubation time 2 hours in TBS/BSA/azide. Secondary antibody: anti Mouse IgG Conjugated to Alexa Fluor® 594 (1/1000).

Floorplate region of developing cervical spinal cord (I have not studied this particular region).



Western blot - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Beta III Tubulin Western blot staining using mouse Anti-beta III Tubulin antibody

This blot was produced using a 4-12% Bis-tris gel under the MOPS buffer system. The gel was run at 200V for 50 minutes before being transferred onto a Nitrocellulose membrane at 30V for 70 minutes. The membrane was then blocked for an hour using LI-COR® blocking buffer before being incubated with ab7751 overnight at 4°C. Antibody binding was detected using the IRDye® 800CW Goat Anti-Mouse secondary at a 1:10,000 dilution for 1hr at room temperature and then imaged using the Odyssey® CLx Imaging System.
All lanes:
Western blot - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751) at 1 µg/mL

Lane 1:
Human brain tissue lysate at 20 µg

Lane 2:
Human spinal cord tissue lysate at 20 µg

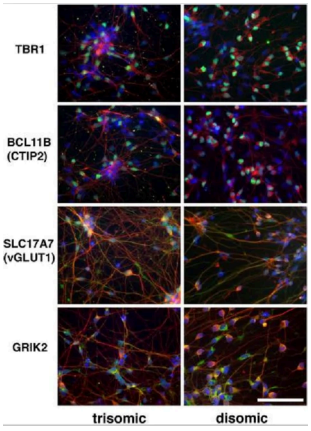
Secondary

All lanes:
IRDye® 800CW Goat Anti-Mouse at 1/10000 dilution

Performed under reducing conditions.

Predicted band size: 50 kDa

Observed band size: 51 kDa



Gonzales et al PLoS One. 2018 Mar 27;13(3):e0194581. doi: 10.1371/journal.pone.0194581. eCollection 2018. Fig 1. Reproduced under the Creative Commons license http://creativecommons.org/licenses/by/4.0/

Immunocytochemistry/ Immunofluorescence - Anti-beta III Tubulin antibody [TU-20] - Neuronal Marker (ab7751)

Confirmation of differentiation of iPSCs into cortical neuronal cultures.
Images taken from clones C2 (trisomic) and C3 -D21 (disomic) 40 days after initiation of the differentiation protocol. Fixed cells on chamber slides were probed with antibodies against the marker proteins listed in the left column. Neuronal marker Beta III tubulin is red (ab7751); DAPI is blue; and Ctip2, TBR1, SLC17A7 (vGLUT1) and GRIK2 are green. Size bar = 20 µ.

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