

# TUBB3 (Neuronal Marker) Rabbit pAb

TUBB3 (Neuronal Marker) Rabbit pAb Catalog # AP52263

#### **Product Information**

**Application** WB, IHC-P, IHC-F, IF

**Primary Accession** Q13509

Reactivity Human, Mouse

Host Rabbit Clonality Polyclonal Calculated MW 50433 **Physical State** Liquid

**Immunogen** KLH conjugated synthetic peptide derived from human beta III Tubulin

401-450/450 **Epitope Specificity** 

Isotype IgG

**Purity** affinity purified by Protein A

**Buffer** 0.01M TBS (pH7.4) with 1% BSA, 0.02% Proclin300 and 50% Glycerol.

SUBCELLULAR LOCATION Cytoplasm, cytoskeleton. Belongs to the tubulin family. **SIMILARITY SUBUNIT** Dimer of alpha and beta chains.

Some glutamate residues at the C-terminus arepolyglutamylated. This Post-translational modifications modification occurs exclusively on glutamateresidues and results in

polyglutamate chains on the gamma-carboxylgroup. Also monoglycylated but

not polyglycylated due to the absence of functional TTLL10 in human.

Monoglycylation is mainlylimited to tubulin incorporated into axonemes (cilia

and flagella)whereas glutamylation is prevalent in neuronal cells, centrioles, axonemes, and the mitotic spindle. Both modifications can coexiston the same protein on adjacent residues, and lowering glycylationlevels increases polyglutamylation, and reciprocally. The precisefunction of such modifications is still unclear but they regulatethe

assembly and dynamics of axonemal microtubules (Probable).

Phosphorylated on Ser-172 by CDK1 during the cell cycle, frommetaphase to telophase, but not in interphase. This phosphorylationinhibits tubulin

incorporation into microtubules.

**DISEASE** Defects in TUBB3 are the cause of congenital fibrosis of extraocular muscles

type 3A (CFEOM3A) [MIM:600638]. A congenitalocular motility disorder marked by restrictive ophthalmoplegiaaffecting extraocular muscles innervated by the oculomotor and/ortrochlear nerves. It is clinically characterized by anchoring of the eyes in downward gaze, ptosis, and backward tilt of the head. Congenital fibrosis of extraocular muscles type 3

presents as anon-progressive, autosomal dominant disorder with

variable expression. Patients may be bilaterally or unilaterally affected, and their oculo-motility defects range from complete ophthalmoplegia (with the

eyes fixed in a hypo- and exotropic position), to mild asymptomatic restrictions of ocular movement. Ptosis, refractive error, amblyopia, and compensatory headpositions are associated with the more severe forms of the disorder. In some cases the ocular phenotype is accompanied by additional

features including developmental delay, corpus callosumagenesis, basal

1 of 4

ganglia dysmorphism, facial weakness, polyneuropathy. Defects in TUBB3 are the cause of cortical dysplasiacomplex with other brain malformations (CDCBM) [MIM:614039]. CDCBMis a disorder of aberrant neuronal migration and disturbed axonalguidance. Affected individuals have mild to severe mentalretardation, strabismus, axial hypotonia, and spasticity. Brainimaging shows variable malformations of cortical development, including polymicrogyria, gyral disorganization, and fusion of thebasal ganglia, as well as thin corpus callosum, hypoplasticbrainstem, and dysplastic cerebellar vermis. Extraocular musclesare not involved.

**Important Note** 

This product as supplied is intended for research use only, not for use in

human, therapeutic or diagnostic applications.

**Background Descriptions** 

Neuronal Marker Beta III tubulin is abundant in the central and peripheral nervous systems (CNS and PNS) where it is prominently expressed during fetal and postnatal development. As exemplified in cerebellar and sympathoadrenal neurogenesis, the distribution of beta III is neuron-associated, exhibiting distinct temporospatial gradients according to the regional neuroepithelia of origin. However, transient expression of this protein is also present in the subventricular zones of the CNS comprising putative neuronal- and/or glial precursor cells, as well as in Kulchitsky neuroendocrine cells of the fetal respiratory epithelium. This temporally restricted, potentially non-neuronal expression may have implications in the identification of presumptive neurons derived from embryonic stem cells.

### **Additional Information**

**Gene ID** 10381

Other Names Tubulin beta-3 chain, Tubulin beta-4 chain, Tubulin beta-III, TUBB3, TUBB4

**Target/Specificity** Expression is primarily restricted to centraland peripheral nervous system.

Greatly increased expression in mostcancerous tissues.

**Dilution** WB=1:500-2000,IHC-P=1:100-500,IHC-F=1:100-500,ICC/IF=1:100-500,IF=1:200-

800,Flow-Cyt=1 ☐g/Test

**Storage** Store at -20 °C for one year. Avoid repeated freeze/thaw cycles. When

reconstituted in sterile pH 7.4 0.01M PBS or diluent of antibody the antibody

is stable for at least two weeks at 2-4 °C.

#### **Protein Information**

Name TUBB3

Synonyms TUBB4

**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: <u>28483977</u>).

**Cellular Location** Cytoplasm, cytoskeleton. Cell projection, growth cone

{ECO:0000250|UniProtKB:Q9ERD7}. Cell projection, lamellipodium {ECO:0000250|UniProtKB:Q9ERD7}. Cell projection, filopodium

{ECO:0000250 | UniProtKB:Q9ERD7}

**Tissue Location** Expression is primarily restricted to central and peripheral nervous system.

Greatly increased expression in most cancerous tissues.

## **Background**

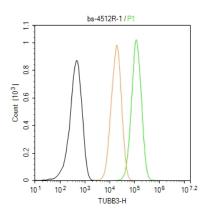
#### **Neuronal Marker**

Beta III tubulin is abundant in the central and peripheral nervous systems (CNS and PNS) where it is prominently expressed during fetal and postnatal development. As exemplified in cerebellar and sympathoadrenal neurogenesis, the distribution of beta III is neuron-associated, exhibiting distinct temporospatial gradients according to the regional neuroepithelia of origin. However, transient expression of this protein is also present in the subventricular zones of the CNS comprising putative neuronal- and/or glial precursor cells, as well as in Kulchitsky neuroendocrine cells of the fetal respiratory epithelium. This temporally restricted, potentially non-neuronal expression may have implications in the identification of presumptive neurons derived from embryonic stem cells.

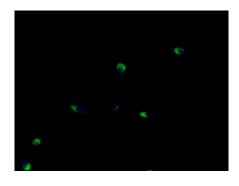
### References

Ranganathan S., et al. Biochim. Biophys. Acta 1395:237-245(1998). Banerjee A., et al. Submitted (OCT-2001) to the EMBL/GenBank/DDBJ databases. Lubec G., et al. Submitted (DEC-2008) to UniProtKB. Katsetos C.D., et al. J. Child Neurol. 18:851-866(2003). Katsetos C.D., et al. J. Child Neurol. 19:531-531(2004).

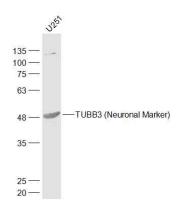
### **Images**



The U-87MG (H) cells were fixed with 4% PFA (10 min at r.t.) and then permeabilized with 90% ice-cold methanol for 20 min at -20°C, the cells then were incubated in 5%BSA to block non-specific protein-protein interactions (30 min at r.t.), followed by secondary antibody incubation for 40 min at room temperature. Primary Antibody (green):Rabbit Anti-TUBB3 antibody (AP52263): 1 µg/10^6 cells; Isotype Control (orange): Rabbit IgG (AP52263). Blank control (black): PBS. Acquisition of 20,000 events was performed.



SH-SY5Y cell; 4% Paraformaldehyde-fixed; Ice-cold methanol at -20°C for 20 min; Blocking buffer (normal goat serum, C-0005) at 37°C for 20 min; Antibody incubation with (TUBB3) polyclonal Antibody, Unconjugated (AP52263) 1:100, 90 minutes at 37°C; followed by a FITC conjugated Goat Anti-Rabbit IgG antibody at 37°C for 90 minutes, DAPI (blue, C02-04002) was used to stain the cell nuclei.



Sample:

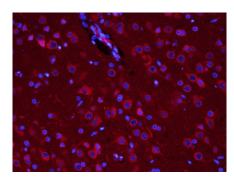
U251(Human) Cell Lysate at 30 ug

Primary: Anti-TUBB3 (Neuronal Marker) (AP52263) at 1/1000 dilution

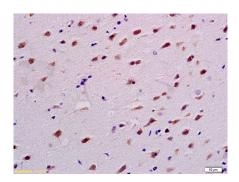
Secondary: IRDye800CW Goat Anti-Rabbit IgG at 1/20000

dilution

Predicted band size: 50-55 kD Observed band size: 50 kD



Paraformaldehyde-fixed, paraffin embedded (Rat brain); Antigen retrieval by boiling in sodium citrate buffer (pH6.0) for 15min; Block endogenous peroxidase by 3% hydrogen peroxide for 20 minutes; Blocking buffer (normal goat serum) at 37°C for 30min; Antibody incubation with (TUBB3) Polyclonal Antibody, Unconjugated (AP52263) at 1:400 overnight at 4°C, followed by a conjugated Goat Anti-Rabbit IgG antibody (AP52263-AF594) for 90 minutes, and DAPI for nuclei staining.



Tissue/cell: rat brain tissue; 4% Paraformaldehyde-fixed and paraffin-embedded;

Antigen retrieval: citrate buffer ( 0.01M, pH 6.0 ), Boiling bathing for 15min; Block endogenous peroxidase by 3% Hydrogen peroxide for 30min; Blocking buffer (normal goat serum,C-0005) at  $37^{\circ}\text{C}$  for 20 min;

Incubation: Anti-TUBB3/beta III Tubulin(Neuronal Marker) Polyclonal Antibody, Unconjugated(AP52263) 1:200, overnight at 4°C, followed by conjugation to the secondary antibody(SP-0023) and DAB(C-0010) staining

### **Citations**

• <u>Identification of molecular markers for superior quantitative traits in a novel sea cucumber strain by comparative microRNA-mRNA expression profiling</u>

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.