β-tubulin Mouse Monoclonal Antibody

MCA-1B12

Ordering Information
Web *www.encorbio.com*
Email *admin@encorbio.com*
Phone *352-372-7022*
Fax *352-372-7066*

HGNC Name: *TUBB*
UniProt: *P02554*
RRID: *AB_2572389*
Immunogen: *Pig brain tubulin preparation*
Format: *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Store at 4°C for short term, for longer term at -20°C*
Recommended dilutions:
WB: 1:5,000-1:10,000. IF: 1:5,000. IHC: not recommended

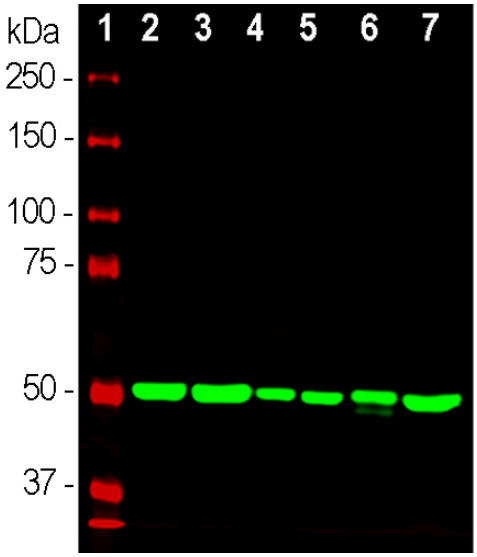
References:

1. Nogales E, Wolf SG, Downing KH. Structure of the alpha-beta tubulin dimer by electron crystallography. Nature 391:199-203 (1998)..
2. Nogales E. Structural insight into microtubule function. Ann. Rev. Biophys. Biomol. Struct. 30:397-420 (2001).
3. Perez EA. Microtubule inhibitors: Differentiating tubulin-inhibiting agents based on mechanisms of action, clinical activity, and resistance. Mol. Cancer Ther. 8:2086-95 (2009).
4. Borisy G, et al. Microtubules: 50 years on from the discovery of tubulin. Nat. Rev. Mol. Cell Biol. 17:322-8 (2016).

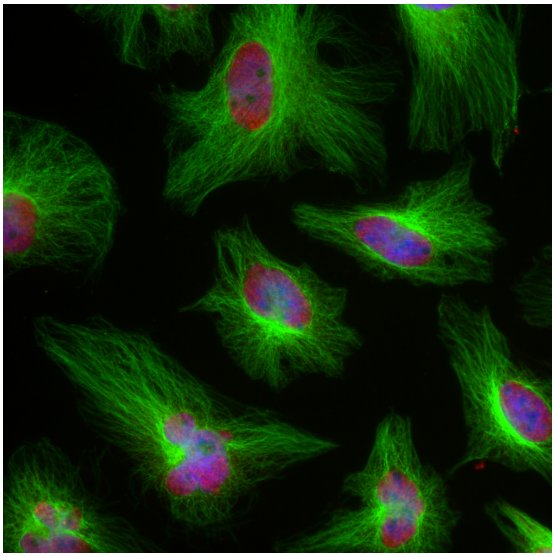
This antibody is new but has been utilized in peer reviewed publications;

1. Lee S, et al. Elevated Peripheral Myelin Protein 22, Reduced Mitotic Potential, and Proteasome Impairment in Dermal Fibroblasts from Charcot-Marie-Tooth Disease Type 1A Patients. Am. J. Pathol. 188:728-38 (2017).

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, ICC/IF	Mouse	IgG2b heavy, κ light	50kDa	Hu, Mo, Rt, Ms



Western blot analysis of whole tissue or cell lysates using mouse mAb to β-tubulin, MCA-1B12, dilution 1:10,000 in green: [1] protein standard (red), [2] adult rat brain, [3] adult mouse brain, [4] NIH-3T3 cells, [5] HEK293 cells, [6] HeLa cells, [7] SH-SY5Y cells. The strong clean band with apparent SDS-PAGE molecular weight of ~50kDa corresponds to the β-tubulin proteins.



Immunofluorescent analysis of HeLa cells stained with mouse mAb to β-tubulin, MCA-1B12, dilution 1:5,000 in green, and costained with chicken pAb to the nucleic acid binding protein FOX2, CPCA-FOX2, dilution 1:1,000 in red. Blue is DAPI stain of nuclear DNA. MCA-1B12 antibody produces strong staining of microtubules in the cytoplasm, while the CPCA-FOX2 antibody labels the nuclei of HeLa cells. Mouse select each image for larger view.

Background:

Tubulins are a major class of cytoskeletal proteins and divided into five distinct classes, namely α, β, γ, δ and ε. The most abundant members of this family are the α and β-tubulins which are the major components of cytoplasmic microtubules. The various subunits have molecular weights of approximately 50kDa and are 50% identical to one another at the protein sequence level. Microtubules are assembled from stable dimers of one α and one β subunit, and regulated polymerization and depolymerization of these dimers controls the number and location of microtubules in cells (1,2). Microtubules are involved in a number of essential cellular functions including the maintenance of cell shape, vesicle and organelle transport, cell motility, cell signaling, meiosis and mitosis. The important role of microtubules in forming the mitotic spindle during cell division makes them a desirable target for the development of therapeutic agents directed against rapidly dividing cancer cells (3). For example, Taxol, a.k.a. Paclitaxel, is a low molecular weight drug which binds αβ tubulin dimers and prevents their polymerization. This prevents formation of the mitotic spindle, inhibits cell division and so halts tumor growth. For an interesting review of the first 50 years of tubulin research see reference 4.

The MCA-1B12 antibody was raised against tubulin purified from pig brain and reacts with recombinant β-tubulin (Abcam), but not recombinant α-tubulin (Abnova) by ELISA and dot blots. β-tubulin is regarded as a “house keeping” protein which is generally not altered much in expression as a result of experimental manipulations. As a result antibodies to β-tubulin are widely used as loading controls in western blotting experiments as a standard by which the levels of other proteins may be measured. As shown here, MCA-1B12 produces a single clean and strong clean band on homogenates of cell and tissue extracts. It will also produce beautiful images of the microtubular network of cells grown in culture and also tissues for ICC but is not recommended for IHC. MCA-1B12 is an IgG2b class antibody and an alternate antibody useful for certain kinds of experiment including IHC is MCA-4E4, an antibody of similar β-tubulin specificity but which is a IgG2a class antibody.

Abbreviation Key:

mAb—Monoclonal Antibody pAb—Polyclonal Antibody WB—Western Blot IF—Immunofluorescence ICC—Immunocytochemistry IHC—Immunohistochemistry E—ELISA Hu—Human Mo—Monkey Do—Dog Rt—Rat Ms—Mouse Co—Cow Pi—Pig Ho—Horse Ch—Chicken Dr—D. rerio Dm—D. melanogaster Sm—S. mutans Ce—C. elegans Sc—S. cerevisiae Sa—S. aureus Ec—E. coli.