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PTEN Antibody

Catalog # ASC10322

Product Information

Application	WB, IF, IP, E
Primary Accession	P60484
Other Accession	P60484, 42560209
Reactivity	Human, Mouse
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	47166
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	PTEN antibody can be used for the detection of PTEN by Western blot at 1 to 2 g/mL. For immunofluorescence start at 2 g/mL.

Additional Information

Gene ID	5728
Other Names	PTEN Antibody: BZS, DEC, CWS1, GLM2, MHAM, TEP1, MMAC1, PTEN1, 10q23del, Phosphatidylinositol 3, 4, 5-trisphosphate 3-phosphatase and dual-specificity protein phosphatase PTEN, Mutated in multiple advanced cancers 1, phosphatase and tensin homolog
Target/Specificity	PTEN;
Reconstitution & Storage	PTEN antibody can be stored at 4℃ for three months and -20℃, stable for up to one year. As with all antibodies care should be taken to avoid repeated freeze thaw cycles. Antibodies should not be exposed to prolonged high temperatures.
Precautions	PTEN Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	PTEN
Synonyms	MMAC1, TEP1
Function	Dual-specificity protein phosphatase, dephosphorylating tyrosine-, serine- and threonine-phosphorylated proteins (PubMed:9187108, PubMed:9256433, PubMed:9616126). Also functions as a lipid phosphatase, removing the phosphate in the D3 position of the inositol ring of PtdIns(3,4,5)P3/phosphatidylinositol 3,4,5- trisphosphate, PtdIns(3,4)P2/phosphatidylinositol 3,4-diphosphate and

	PtdIns3P/phosphatidylinositol 3-phosphate with a preference for PtdIns(3,4,5)P3 (PubMed:16824732, PubMed:26504226, PubMed:9593664, PubMed:9811831). Furthermore, this enzyme can also act as a cytosolic inositol 3-phosphatase acting on Ins(1,3,4,5,6)P5/inositol 1,3,4,5,6 pentakisphosphate and possibly Ins(1,3,4,5)P4/1D-myo-inositol 1,3,4,5-tetrakisphosphate (PubMed:11418101, PubMed:15979280). Antagonizes the PI3K-AKT/PKB signaling pathway by dephosphorylating phosphoinositides and thereby modulating cell cycle progression and cell survival (PubMed:31492966, PubMed:37279284). The unphosphorylated form cooperates with MAGI2 to suppress AKT1 activation (PubMed:11707428). In motile cells, suppresses the formation of lateral pseudopods and thereby promotes cell polarization and directed movement (PubMed:22279049). Dephosphorylates tyrosine-phosphorylated focal adhesion kinase and inhibits cell migration and integrin-mediated cell spreading and focal adhesion formation (PubMed:22279049). Required for growth factor-induced epithelial cell migration; growth factor stimulation induces PTEN phosphorylation which changes its binding preference from the p85 regulatory subunit of the PI3K kinase complex to DLC1 and results in translocation of the PTEN-DLC1 complex to the posterior of migrating cells to promote RHOA activation (PubMed:26166433). Meanwhile, TNS3 switches binding preference from DLC1 to p85 and the TNS3-p85 complex translocates to the leading edge of migrating cells to activate RAC1 activation (PubMed:26166433). Plays a role as a key modulator of the AKT-mTOR signaling pathway controlling the tempo of the process of newborn neurons integration during adult neurogenesis, including correct neuron positioning, dendritic development and synapse formation (By similarity). Involved in the regulation of synaptic function in excitatory hippocampal synapses. Recruited to the postsynaptic membrane upon NMDA receptor activation, is required for the modulation of synaptic activity during plasticity. Enhancement of lipid phosphatase activity is able to drive depression of AMPA receptor-mediated synaptic responses, activity required for NMDA receptor-dependent long-term depression (LTD) (By similarity). May be a negative regulator of insulin signaling and glucose metabolism in adipose tissue. The nuclear monoubiquitinated form possesses greater apoptotic potential, whereas the cytoplasmic nonubiquitinated form induces less tumor suppressive ability (PubMed:10468583, PubMed:18716620).
Cellular Location	Cytoplasm. Nucleus. Nucleus, PML body. Cell projection, dendritic spine {ECO:0000250|UniProtKB:O54857}. Postsynaptic density {ECO:0000250|UniProtKB:O54857}. Note=Monoubiquitinated form is nuclear Nonubiquitinated form is cytoplasmic. Colocalized with PML and USP7 in PML nuclear bodies (PubMed:18716620). XIAP/BIRC4 promotes its nuclear localization (PubMed:19473982). Associates with the postsynaptic density in response to NMDAR activation (By similarity) {ECO:0000250|UniProtKB:O54857, ECO:0000269|PubMed:18716620, ECO:0000269|PubMed:19473982}
Tissue Location	Expressed at a relatively high level in all adult tissues, including heart, brain, placenta, lung, liver, muscle, kidney and pancreas.

Background

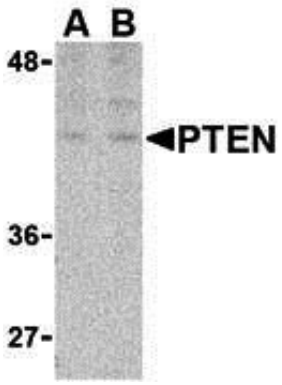
PTEN Antibody: PTEN (phosphatase and tensin homologue deleted on chromosome ten) is a dual-specificity phosphatase (with both protein and lipid phosphatase activity) first identified as a tumor suppressor gene. PTEN indirectly activates the AKT/PI3K pathway, an important signaling pathway for cell growth and proliferation by keeping levels of the second messenger PIP3 low, thereby preventing phosphoinositide-dependent kinase-1 (PDK-1) from phosphorylating and activating AKT. Expression of wild-type PTEN causes growth arrest in many cancer cell lines, but expression of a PTEN protein containing a mutation that blocks its lipid phosphatase activity failed to suppress growth of glioma cell lines suggesting

that the tumor suppressive effect of PTEN is mediated solely by its lipid phosphatase activity. Other activities include the inhibition of insulin stimulated MAPK activation by blocking the insulin-receptor substrate (IRS)-1 phosphorylation and assembly of the IRS-1/Grb2/Sos complex.

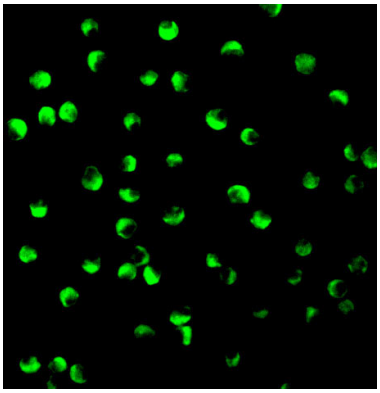
References

Li J, Yen C, Liaw D, et al. PTEN, a putative protein tyrosine phosphatase gene mutated in human brain, breast, and prostate cancer. Science1997; 275:1943-7.
Steck PA, Pershouse MA, Jasser SA, et al. Identification of a candidate tumor suppressor gene, MMAC1, a chromosome 10q23.3 that is mutated in multiple advanced cancers. Nat. Genet.1997; 15:356-62.
Wu X, Senechal K, Neshat MS, et al. The PTEN/MMAC1 tumor suppressor phosphatase functions as a negative regulator of the phosphoinositide 3-kinase/Akt pathway. Proc. Natl. Acad. Sci. USA1998; 95:15587-91.
Myers MP, Pass I, Batty IH, et al. The lipid phosphatase activity of PTEN is critical for its tumor suppressor function. Proc. Natl. Acad. Sci. USA1998; 95:13513-8.

Images



Western blot analysis of PTEN in P815 cell lysate with PTEN (NT) antibody at (A) 1 and (B) 2 µg/mL.



Immunofluorescence of PTEN in P815 cells with PTEN antibody at 2 µg/mL.

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