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PPP1CA Antibody

Purified Mouse Monoclonal Antibody
Catalog # AO1657a

Product Information

Application	WB, E
Primary Accession	P62136
Reactivity	Human
Host	Mouse
Clonality	Monoclonal
Clone Names	5E9
Isotype	IgG1
Calculated MW	37512
Description	The protein encoded by this gene is one of the three catalytic subunits of protein phosphatase 1 (PP1). PP1 is a serine/threonine specific protein phosphatase known to be involved in the regulation of a variety of cellular processes, such as cell division, glycogen metabolism, muscle contractility, protein synthesis, and HIV-1 viral transcription. Increased PP1 activity has been observed in the end stage of heart failure. Studies in both human and mice suggest that PP1 is an important regulator of cardiac function. Mouse studies also suggest that PP1 functions as a suppressor of learning and memory. Three alternatively spliced transcript variants encoding different isoforms have been found for this gene.
Immunogen	Purified recombinant fragment of human PPP1CA expressed in E. Coli.
Formulation	Ascitic fluid containing 0.03% sodium azide.

Additional Information

Gene ID	5499
Other Names	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit, PP-1A, 3.1.3.16, PPP1CA, PPP1A
Dilution	WB~~1/500 - 1/2000 E~~1/10000
Storage	Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.
Precautions	PPP1CA Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	PPP1CA
Synonyms	PPP1A
Function	Protein phosphatase that associates with over 200 regulatory proteins to form highly specific holoenzymes which dephosphorylate hundreds of biological targets (PubMed:28216226, PubMed:30158517, PubMed:35768504, PubMed:35830882, PubMed:35831509, PubMed:36175670, PubMed:39603239, PubMed:39603240). Protein phosphatase 1 (PP1) is essential for cell division, transcription elongation, and participates in the regulation of glycogen metabolism, muscle contractility and protein synthesis (PubMed:35768504, PubMed:35830882, PubMed:35831509, PubMed:36175670, PubMed:39603239, PubMed:39603240). Involved in regulation of ionic conductances and long-term synaptic plasticity. May play an important role in dephosphorylating substrates such as the postsynaptic density-associated Ca(2+)/calmodulin dependent protein kinase II. Catalytic component of the PNUTS-PP1 protein phosphatase complex, a protein phosphatase 1 (PP1) complex that promotes RNA polymerase II transcription pause-release, allowing transcription elongation: the PNUTS-PP1 complex mediates the release of RNA polymerase II from promoter-proximal region of genes by catalyzing dephosphorylation of proteins involved in transcription, such as AFF4, CDK9, MEPCE, INTS12, NCBP1, POLR2M/GDOWN1 and SUPT6H (PubMed:39603239, PubMed:39603240). The PNUTS-PP1 complex also regulates transcription termination by mediating dephosphorylation of SUPT5H in termination zones downstream of poly(A) sites, thereby promoting deceleration of RNA polymerase II transcription (PubMed:31677974). PNUTS-PP1 complex is also involved in the response to replication stress by mediating dephosphorylation of POLR2A at 'Ser-5' of the CTD, promoting RNA polymerase II degradation (PubMed:33264625). PNUTS-PP1 also plays a role in the control of chromatin structure and cell cycle progression during the transition from mitosis into interphase (PubMed:20516061). Regulates NEK2 function in terms of kinase activity and centrosome number and splitting, both in the presence and absence of radiation- induced DNA damage (PubMed:17283141). Regulator of neural tube and optic fissure closure, and enteric neural crest cell (ENCCs) migration during development (By similarity). In balance with CSNK1D and CSNK1E, determines the circadian period length, through the regulation of the speed and rhythmicity of PER1 and PER2 phosphorylation (PubMed:21712997). May dephosphorylate CSNK1D and CSNK1E (PubMed:21712997). Dephosphorylates the 'Ser-418' residue of FOXP3 in regulatory T-cells (Treg) from patients with rheumatoid arthritis, thereby inactivating FOXP3 and rendering Treg cells functionally defective (PubMed:23396208). Dephosphorylates CENPA (PubMed:25556658). Dephosphorylates the 'Ser-139' residue of ATG16L1 causing dissociation of ATG12-ATG5-ATG16L1 complex, thereby inhibiting autophagy (PubMed:26083323). Together with PPP1CC (PP1-gamma subunit), dephosphorylates IFIH1/MDA5 and RIG-I leading to their activation and a functional innate immune response (PubMed:23499489). Core component of the SHOC2-MRAS-PP1c (SMP) holophosphatase complex that regulates the MAPK pathway activation (PubMed:35768504, PubMed:35830882, PubMed:35831509, PubMed:36175670). The SMP complex specifically dephosphorylates the inhibitory phosphorylation at 'Ser-259' of RAF1 kinase, 'Ser-365' of BRAF kinase and 'Ser-214' of ARAF kinase, stimulating their kinase activities (PubMed:35768504, PubMed:35830882, PubMed:35831509, PubMed:36175670). The SMP complex enhances the dephosphorylation activity and substrate specificity of PP1c (PubMed:35768504, PubMed:36175670).
Cellular Location	Cytoplasm. Nucleus. Nucleus, nucleoplasm. Nucleus, nucleolus Postsynaptic

density {ECO:0000250|UniProtKB:P62137}. Note=Primarily nuclear and largely excluded from the nucleolus. Highly mobile in cells and can be relocalized through interaction with targeting subunits NOM1 plays a role in targeting this protein to the nucleolus. In the presence of PPP1R8 relocalizes from the nucleus to nuclear speckles Shuttles toward the cytosol during infection with VEEV (PubMed:29769351).

References

1. J Biol Chem. 2009 Sep 18;284(38):25576-84. 2. Mol Cell Biol. 2009 Jun;29(12):3355-66.

Images

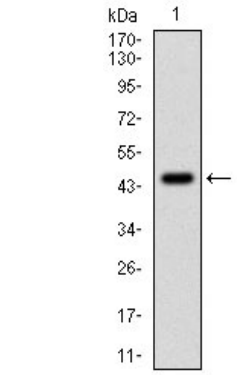


Figure 1: Western blot analysis using PPP1CA mAb against human PPP1CA (AA: 174-330) recombinant protein. (Expected MW is 43.4 kDa)

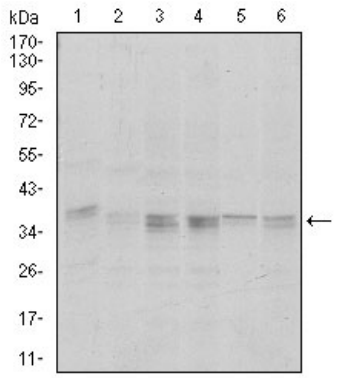


Figure 2: Western blot analysis using PPP1CA mouse mAb against Hela (1), HepG2 (2), MCF-7 (3), Jurkat (4) and A549 (5) cell lysate.

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