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Amyloid beta 40 Recombinant Mouse mAb

Catalog # AP98645

Product Information

Application	IHC-P, IHC-F, IF
Primary Accession	P12023
Other Accession	P12023
Reactivity	Rat, Human, Mouse
Host	Mouse
Clonality	Recombinant
Calculated MW	86722
Physical State	Liquid
Immunogen	KLH conjugated synthetic peptide derived from Mouse Amyloid beta 40
Isotype	IgG1
Purity	Affinity Purification
Buffer	PBS with 100 □g/ml BSA,0.15% ProClin300 and 50% glycerol.
SIMILARITY	Belongs to the APP family. Contains 1 BPTI/Kunitz inhibitor domain.
SUBUNIT	Binds, via its C-terminus, to the PID domain of several cytoplasmic proteins, including APBB family members, the APBA family, MAPK8IP1, SHC1 and, NUMB and DAB. Binding to DAB1 inhibits its serine phosphorylation (By similarity). Also interacts with GPCR-like protein BPP, FPRL1, APPBP1, IB1, KNS2 (via its TPR domains), APPBP2 (via BaSS) and DDB1. In vitro, it binds MAPT via the MT-binding domains. Associates with microtubules in the presence of ATP and in a kinesin-dependent manner. Interacts, through a C-terminal domain, with GNAO1. Amyloid beta-42 binds CHRNA7 in hippocampal neurons. Beta-amyloid associates with HADH2. Soluble APP binds, via its N-terminal head, to FBLN1. Interacts with CPEB1 and AGER. Interacts with ANKS1B and TNFRSF21. Interacts with ITM2B. Interacts with ITM2C. Interacts with IDE. Can form homodimers; this is promoted by heparin binding.
Post-translational modifications	Proteolytically processed under normal cellular conditions. Cleavage either by alpha-secretase, beta-secretase or theta-secretase leads to generation and extracellular release of soluble APP peptides, S-APP-alpha and S-APP-beta, and the retention of corresponding membrane-anchored C-terminal fragments, C80, C83 and C99. Subsequent processing of C80 and C83 by gamma-secretase yields P3 peptides. This is the major secretory pathway and is non-amyloidogenic. Alternatively, presenilin/nicastrin-mediated gamma-secretase processing of C99 releases the amyloid beta proteins, amyloid-beta 40 (Abeta40) and amyloid-beta 42 (Abeta42), major components of amyloid plaques, and the cytotoxic C-terminal fragments, gamma-CTF(50), gamma-CTF(57) and gamma-CTF(59). Proteolytically cleaved by caspases during neuronal apoptosis. Cleavage at Asp-739 by either caspase-6, -8 or -9 results in the production of the neurotoxic C31 peptide and the increased production of beta-amyloid peptides. N- and O-glycosylated. O-linkage of chondroitin sulfate to the L-APP isoforms produces the APP proteoglycan core proteins, the appicans. The chondroitin sulfate chain of appicans contains 4-O-sulfated galactose in the linkage region and chondroitin sulfate E in the repeated disaccharide region. Phosphorylation in the C-terminal on tyrosine, threonine and serine residues is neuron-specific. Phosphorylation can affect

	APP processing, neuronal differentiation and interaction with other proteins. Phosphorylated on Thr-743 in neuronal cells by Cdc5 kinase and Mapk10, in dividing cells by Cdc2 kinase in a cell-cycle dependent manner with maximal levels at the G2/M phase and, in vitro, by GSK-3-beta. The Thr-743 phosphorylated form causes a conformational change which reduces binding of Fe65 family members. Phosphorylation on Tyr-757 is required for SHC binding. Phosphorylated in the extracellular domain by casein kinases on both soluble and membrane-bound APP. This phosphorylation is inhibited by heparin. Extracellular binding and reduction of copper, results in a corresponding oxidation of Cys-144 and Cys-158, and the formation of a disulfide bond. In vitro, the APP-Cu(+) complex in the presence of hydrogen peroxide results in an increased production of beta-amyloid-containing peptides. Trophic-factor deprivation triggers the cleavage of surface APP by beta-secretase to release sAPP-beta which is further cleaved to release an N-terminal fragment of APP (N-APP). Beta-amyloid peptides are degraded by IDE.
DISEASE	Defects in APP are the cause of Alzheimer disease type 1 (AD1) [MIM:104300]. AD1 is a familial early-onset form of Alzheimer disease. It can be associated with cerebral amyloid angiopathy. Alzheimer disease is a neurodegenerative disorder characterized by progressive dementia, loss of cognitive abilities, and deposition of fibrillar amyloid proteins as intraneuronal neurofibrillary tangles, extracellular amyloid plaques and vascular amyloid deposits. The major constituent of these plaques is the neurotoxic amyloid-beta-APP 40-42 peptide (s), derived proteolytically from the transmembrane precursor protein APP by sequential secretase processing. The cytotoxic C-terminal fragments (CTFs) and the caspase-cleaved products such as C31 derived from APP, are also implicated in neuronal death. Defects in APP are the cause of cerebral amyloid angiopathy APP-related (CAA-APP) [MIM:605714]. A hereditary localized amyloidosis due to amyloid-beta A4 peptide(s) deposition in the cerebral vessels. The principal clinical characteristics are recurrent cerebral and cerebellar hemorrhages, recurrent strokes, cerebral ischemia, cerebral infarction, and progressive mental deterioration. Patients develop cerebral hemorrhage because of the severe cerebral amyloid angiopathy. Parenchymal amyloid deposits are rare and largely in the form of pre-amyloid lesions or diffuse plaque-like structures. They are Congo red negative and lack the dense amyloid cores commonly present in Alzheimer disease. Some affected individuals manifest progressive aphasic dementia, leukoencephalopathy, and occipital calcifications.
Important Note	This product as supplied is intended for research use only, not for use in human, therapeutic or diagnostic applications.
Background Descriptions	Most of autosomal dominant familial AD can be attributed to mutations in one of three genes: those encoding amyloid precursor protein (APP) and presenilins 1 and 2 Most mutations in the APP and presenilin genes increase the production of a small protein called Aβ42, which is the main component of senile plaques. Some of the mutations merely alter the ratio between Aβ42 and the other major forms—particularly Aβ40—without increasing Aβ42 levels.

Additional Information

Gene ID	11820
Other Names	AAA; ABETA; ABPP; AD1; APPI; CTFgamma; CVAP; PN-II; PN2; alpha-sAPP; preA4; Adap; Ag; E030013M08Rik; betaApp; A4_HUMAN; APP; Alzheimer disease amyloid A4 protein homolog; Alzheimer disease amyloid protein; Amyloid precursor protein; Amyloid-beta (A4) precursor protein; Amyloid-beta A4 protein; Cerebral vascular amyloid peptide (CVAP); Protease nexin-II (PN-II); A4; A4_RAT; ABPP (APP); Amyloidogenic glycoprotein (AG); amyloid

	beta precursor protein; Alzheimer disease; amyloid beta (A4) precursor protein; peptidase nexin-II
Dilution	IHC-P=1: 200-800,IF=1: 200-800,IHC-F=1: 200-800
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	App {ECO:0000312|MGI:MGI:88059}
Function	Functions as a cell surface receptor and performs physiological functions on the surface of neurons relevant to neurite growth, neuronal adhesion and axonogenesis. Interaction between APP molecules on neighboring cells promotes synaptogenesis. Involved in cell mobility and transcription regulation through protein-protein interactions. Can promote transcription activation through binding to APBB1-KAT5 and inhibit Notch signaling through interaction with Numb. Couples to apoptosis-inducing pathways such as those mediated by G(o) and JIP. Inhibits G(o)-alpha ATPase activity (By similarity). Acts as a kinesin I membrane receptor, mediating the axonal transport of beta- secretase and presenilin 1 (By similarity). By acting as a kinesin I membrane receptor, plays a role in axonal anterograde transport of cargo towards synapses in axons (By similarity). May be involved in copper homeostasis/oxidative stress through copper ion reduction. Can regulate neurite outgrowth through binding to components of the extracellular matrix such as heparin and collagen I and IV (By similarity). The splice isoforms that contain the BPTI domain possess protease inhibitor activity. Induces a AGER-dependent pathway that involves activation of p38 MAPK, resulting in internalization of amyloid-beta peptide and leading to mitochondrial dysfunction in cultured cortical neurons (By similarity). Provides Cu(2+) ions for GPC1 which are required for release of nitric oxide (NO) and subsequent degradation of the heparan sulfate chains on GPC1.
Cellular Location	Cell membrane; Single-pass type I membrane protein {ECO:0000250|UniProtKB:P05067} Membrane {ECO:0000250|UniProtKB:P05067}; Single-pass type I membrane protein {ECO:0000250|UniProtKB:P05067}. Perikaryon {ECO:0000250|UniProtKB:P08592}. Cell projection, growth cone {ECO:0000250|UniProtKB:P08592}. Membrane, clathrin-coated pit {ECO:0000250|UniProtKB:P05067}. Early endosome. Cytoplasmic vesicle {ECO:0000250|UniProtKB:P05067}. Golgi apparatus, trans-Golgi network. Note=Cell surface protein that rapidly becomes internalized via clathrin-coated pits. Only a minor proportion is present at the cell membrane; most of the protein is present in intracellular vesicles. During maturation, the immature APP (N-glycosylated in the endoplasmic reticulum) moves to the Golgi complex where complete maturation occurs (O-glycosylated and sulfated) After alpha-secretase cleavage, soluble APP is released into the extracellular space and the C-terminal is internalized to endosomes and lysosomes. Some APP accumulates in secretory transport vesicles leaving the late Golgi compartment and returns to the cell surface. APP sorts to the basolateral surface in epithelial cells. During neuronal differentiation, the Thr-743 phosphorylated form is located mainly in growth cones, moderately in neurites and sparingly in the cell body Casein kinase phosphorylation can occur either at the cell surface or within a post-Golgi compartment (By similarity). Associates with GPC1 in perinuclear compartments (PubMed:15677459). Colocalizes with SORL1 in a vesicular pattern in

	cytoplasm and perinuclear regions (By similarity). Upon neuronal activation, routed into BACE1-positive recycling endosomes via a clathrin -dependent mechanism (PubMed:23931995). {ECO:0000250|UniProtKB:P05067, ECO:0000269|PubMed:15677459, ECO:0000269|PubMed:23931995} [C83]: Endoplasmic reticulum {ECO:0000250|UniProtKB:P05067}. Golgi apparatus {ECO:0000250|UniProtKB:P05067}. Early endosome {ECO:0000250|UniProtKB:P05067} [Amyloid-beta protein 42]: Cell surface. Note=Associates with FPR2 at the cell surface and the complex is then rapidly internalized. {ECO:0000250|UniProtKB:P05067}
Tissue Location	Expressed in the brain with expression in cortex, cerebellum, hippocampus, olfactory bulb, neurons, astrocytes and microglia (at protein level) (PubMed:25757569, PubMed:26260791, PubMed:28720718). Expressed in the retinal lens (PubMed:25757569) Expressed at a low level in muscle cells (at protein level) (PubMed:25757569). [Isoform APP751]: Widely expressed (PubMed:8510506). Expressed in several different brain regions including hippocampus, substantia nigra pars compacta and cerebellum (PubMed:8510506). Within the cerebellum, abundantly expressed in Purkinje cells (PubMed:8510506). [Isoform APP714]: Expressed in several different brain regions including hippocampus, substantia nigra pars compacta and cerebellum (PubMed:8510506). Within the cerebellum, abundantly expressed in Purkinje cells (PubMed:8510506)

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