

Product datasheet

Anti-beta Amyloid antibody ab2539

★★★★★ 10 Abreviews 51 References 6 Images

Overview

Product name	Anti-beta Amyloid antibody
Description	Rabbit polyclonal to beta Amyloid
Host species	Rabbit
Tested applications	Suitable for: WB, ELISA
Species reactivity	Reacts with: Mouse, Human
Immunogen	Synthetic peptide corresponding to Human beta Amyloid aa 1-14 conjugated to keyhole limpet haemocyanin.
General notes	<p>The Life Science industry has been in the grips of a reproducibility crisis for a number of years. Abcam is leading the way in addressing this with our range of recombinant monoclonal antibodies and knockout edited cell lines for gold-standard validation. Please check that this product meets your needs before purchasing.</p> <p>If you have any questions, special requirements or concerns, please send us an inquiry and/or contact our Support team ahead of purchase. Recommended alternatives for this product can be found below, along with publications, customer reviews and Q&As</p>

Properties

Form	Liquid
Storage instructions	Shipped at 4°C. Upon delivery aliquot and store at -20°C or -80°C. Avoid repeated freeze / thaw cycles.
Storage buffer	Preservative: 0.01% Sodium azide Constituents: 0.42% Potassium phosphate, 0.87% Sodium chloride
Purity	Immunogen affinity purified
Purification notes	Sterile filtered.
Clonality	Polyclonal
Isotype	IgG

Applications

The Abpromise guarantee Our [Abpromise guarantee](#) covers the use of ab2539 in the following tested applications.

The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

Application	Abreviews	Notes
WB		1/1000 - 1/5000. Predicted molecular weight: 87 kDa. A 40-50 kD band consistent with a higher MW precursor is detected in western blot. 4% PFA for paraffin embedded tissues and 10% formalin for frozen tissue for fixation is recommended.
ELISA		1/10000 - 1/30000.
IF		1/50 - 1/200.

Target

Function

Functions as a cell surface receptor and performs physiological functions on the surface of neurons relevant to neurite growth, neuronal adhesion and axonogenesis. Involved in cell mobility and transcription regulation through protein-protein interactions. Can promote transcription activation through binding to APBB1-KAT5 and inhibits 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. Involved in copper homeostasis/oxidative stress through copper ion reduction. In vitro, copper-metallated APP induces neuronal death directly or is potentiated through Cu(2+)-mediated low-density lipoprotein oxidation. Can regulate neurite outgrowth through binding to components of the extracellular matrix such as heparin and collagen I and IV. 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.

Beta-amyloid peptides are lipophilic metal chelators with metal-reducing activity. Bind transient metals such as copper, zinc and iron. In vitro, can reduce Cu(2+) and Fe(3+) to Cu(+) and Fe(2+), respectively. Beta-amyloid 42 is a more effective reductant than beta-amyloid 40. Beta-amyloid peptides bind to lipoproteins and apolipoproteins E and J in the CSF and to HDL particles in plasma, inhibiting metal-catalyzed oxidation of lipoproteins. Beta-APP42 may activate mononuclear phagocytes in the brain and elicit inflammatory responses. Promotes both tau aggregation and TPK II-mediated phosphorylation. Interaction with overexpressed HADH2 leads to oxidative stress and neurotoxicity.

Appicans elicit adhesion of neural cells to the extracellular matrix and may regulate neurite outgrowth in the brain.

The gamma-CTF peptides as well as the caspase-cleaved peptides, including C31, are potent enhancers of neuronal apoptosis.

N-APP binds TNFRSF21 triggering caspase activation and degeneration of both neuronal cell bodies (via caspase-3) and axons (via caspase-6).

Tissue specificity

Expressed in all fetal tissues examined with highest levels in brain, kidney, heart and spleen. Weak expression in liver. In adult brain, highest expression found in the frontal lobe of the cortex and in the anterior perisylvian cortex-opercular gyri. Moderate expression in the cerebellar cortex, the posterior perisylvian cortex-opercular gyri and the temporal associated cortex. Weak expression found in the striate, extra-striate and motor cortices. Expressed in cerebrospinal fluid, and plasma. Isoform APP695 is the predominant form in neuronal tissue, isoform APP751 and isoform APP770 are widely expressed in non-neuronal cells. Isoform APP751 is the most

abundant form in T-lymphocytes. Appican is expressed in astrocytes.

Involvement in 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 amyloidosis cerebroarterial Dutch type (AMYLCAAD) [MIM:605714]; also known as hereditary cerebral hemorrhage with amyloidosis Dutch type (HCHWAD). AMYLCAAD is a hereditary localized amyloidosis due to amyloid-beta A4 peptide(s) deposition in the cerebral vessels. Beta-APP40 is the predominant form of cerebrovascular amyloid. Amyloid is not found outside the nervous system. The principal clinical characteristics are recurrent cerebral and cerebellar hemorrhages, recurrent strokes, cerebral ischemia, cerebral infarction, and progressive mental deterioration. Onset of the disease is in middle age (44 to 60 years). 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.

Defects in APP are the cause of amyloidosis cerebroarterial Italian type (AMYLCAIT) [MIM:605714]. AMYLCAIT is a hereditary localized amyloidosis due to amyloid-beta A4 peptide(s) deposition in the cerebral vessels, resulting in cerebral amyloid angiopathy. Amyloid is not found outside the nervous system. It is a condition very similar to AMYLCAAD, but the clinical course is less severe. Patients manifest mild cognitive decline, recurrent strokes, and epilepsy in some cases. There are extensive amyloid deposits in leptomeningeal and cortical vessels and, to a lesser extent, in the neuropil of the cerebral cortex, in the absence of neurofibrillary tangles.

Defects in APP are the cause of amyloidosis cerebroarterial Iowa type (AMYLCAIW) [MIM:605714]. AMYLCAIW is a hereditary amyloidosis due to amyloid-beta A4 peptide(s) deposition. Patients have progressive aphasic dementia, leukoencephalopathy, and occipital calcifications.

Sequence similarities

Belongs to the APP family.
Contains 1 BPTI/Kunitz inhibitor domain.

Domain

The basolateral sorting signal (BaSS) is required for sorting of membrane proteins to the basolateral surface of epithelial cells.
The NPXY sequence motif found in many tyrosine-phosphorylated proteins is required for the specific binding of the PID domain. However, additional amino acids either N- or C-terminal to the NPXY motif are often required for complete interaction. The PID domain-containing proteins which bind APP require the YENPTY motif for full interaction. These interactions are independent of phosphorylation on the terminal tyrosine residue. The NPXY site is also involved in clathrin-mediated endocytosis.

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.

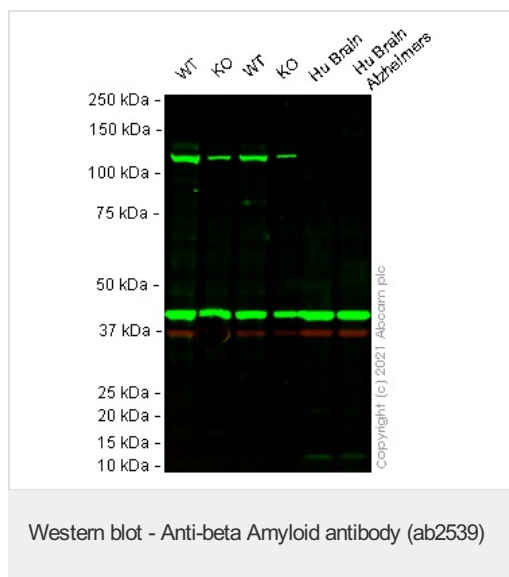
Cellular localization

Membrane. Membrane > clathrin-coated pit. Cell surface protein that rapidly becomes internalized via clathrin-coated pits. 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.

Gamma-CTF(59) peptide is located to both the cytoplasm and nuclei of neurons. It can be translocated to the nucleus through association with APBB1 (Fe65). Beta-APP42 associates with FRPL1 at the cell surface and the complex is then rapidly internalized. 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.

Images



All lanes : Anti-beta Amyloid antibody (ab2539) at 1/1000 dilution

Lane 1 : Wild-type Hap1 cell lysate

Lane 2 : APP knockout Hap1 cell lysate

Lane 3 : Wild-type HEK-293T cell lysate

Lane 4 : APP knockout HEK-293T cell lysate

Lane 5 : Human Brain tissue lysate

Lane 6 : Human Alzheimers Brain tissue lysate

Lysates/proteins at 20 µg per lane.

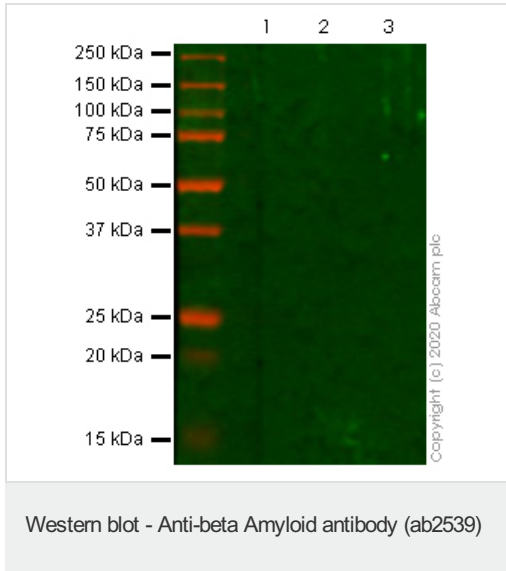
Performed under reducing conditions.

Predicted band size: 87 kDa

Observed band size: 87 kDa

Lanes 1 - 6: Merged signal (red and green). Green - ab2539 observed at 87 kDa. Red - loading control [ab8245](#) (Mouse anti-GAPDH antibody [6C5]) observed at 37 kDa.

Wild-type HeLa and APP knockout cell lysates were subjected to SDS-PAGE. Membranes were blocked in 3 % milk in TBS-T (0.1 % Tween®) before incubation with ab2539 and [ab8245](#) (Mouse anti-GAPDH antibody [6C5]) overnight at 4 °C at a 1 in 1000 dilution and a 1 in 20000 dilution respectively. Blots were incubated with Goat anti-Rabbit IgG H&L (IRDye® 800CW) preabsorbed ([ab216773](#)) and Goat anti-Mouse IgG H&L (IRDye® 680RD) preabsorbed ([ab216776](#)) secondary antibodies at 1 in 20000 dilution for 1 h at room temperature before imaging.



All lanes : Anti-beta Amyloid antibody (ab2539) at 1/1000 dilution

Lane 1 : Ab120479 – beta amyloid peptide 1-40 to be run as lysate (5ng) cell lysate

Lane 2 : Empty at 0 µg

Lane 3 : Ab120301 – beta amyloid peptide 1-42 to be run as lysate (5ng) cell lysate

Performed under reducing conditions.

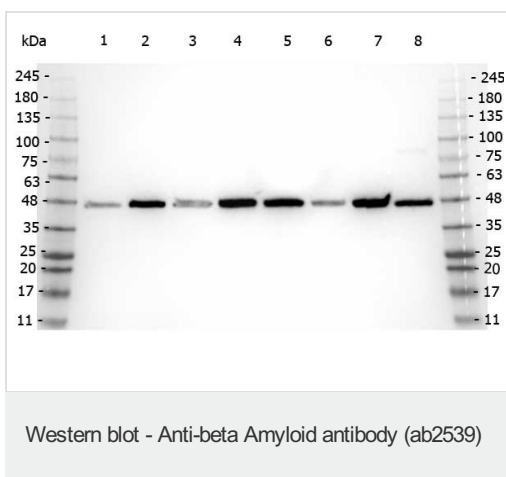
Predicted band size: 87 kDa

Observed band size: 0 kDa

Lanes 1 - 3: Green - ab2539 observed at 0kDa.

ab2539 was shown to not react with APP in western blot.

Membranes were blocked in 3% milk in TBS-T (0.1% Tween®) before incubation with ab2539 and overnight at 4°C at a 1 in 1000 dilution. Blots were incubated with Goat anti-Rabbit IgG H&L (IRDye® 800CW) preabsorbed ([ab216773](#)) secondary antibody at 1 in 20000 dilution for 1 hour at room temperature before imaging.



All lanes : Anti-beta Amyloid antibody (ab2539) at 1/5000 dilution

Lane 1 : HEK293 cell lysate with Casein-TTBS

Lane 2 : HeLa cell lysate with Casein-TTBS

Lane 3 : MCF-7 cell lysate with Casein-TTBS

Lane 4 : Jurkat cell lysate with Casein-TTBS

Lane 5 : A431 cell lysate with Casein-TTBS

Lane 6 : LNCaP cell lysate with Casein-TTBS

Lane 7 : A-172 cell lysate with Casein-TTBS

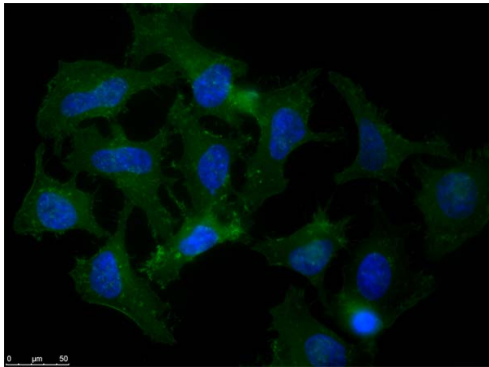
Lane 8 : NIH/3T3 cell lysate with Casein-TTBS

Lysates/proteins at 35 µg per lane.

Blocking peptides at 1 % per lane.

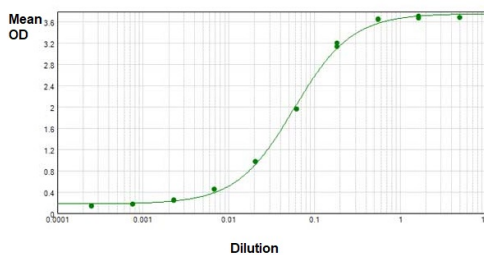
Predicted band size: 87 kDa

Western blot analysis of cell lysates (35 ug/lane) labelling beta Amyloid with ab2539 at 1/5000 overnight at 4°C. A peroxidase rabbit secondary antibody (1/30,000) was used. A blocking buffer of 1% Casein-TTBS was used for 30 minutes at room temperature.



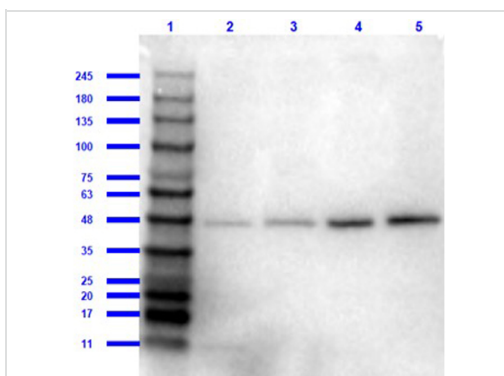
Immunofluorescence - Anti-beta Amyloid antibody (ab2539)

ab2539 staining beta Amyloid (green) in HeLa cells by ICC/IF. Cells were fixed with methanol. The sample was incubated with primary antibody (1 ug/ml) overnight at 4°C, followed by anti-rabbit IgG DyLight™488 conjugated antibody at 2 ug/ml for 1 hour at room temperature. DAPI (blue) was used as a nuclear counterstain.



ELISA - Anti-beta Amyloid antibody (ab2539)

ab2539 detecting beta Amyloid against BSA-conjugated peptide of the immunizing peptide by ELISA. Each well was coated with 0.1 ug of conjugate. The starting dilution of antibody was 5 ug/ml and the X-axis represents the Log10 of a 3-fold dilution. Assay performed using 3% fish gel, peroxidase-conjugated goat anti-rabbit IgG antibody and TMB ELISA peroxidase substrate.



Western blot - Anti-beta Amyloid antibody (ab2539)

Lanes 2-4 : Anti-beta Amyloid antibody (ab2539) at 1/1000 dilution

Lane 5 : Anti-beta Amyloid antibody (ab2539) at 1000 µg

Lane 2 : HEK293 cell lysate

Lane 3 : Mouse brain whole cell lysate

Lane 4 : A-172 cell lysate

Lane 5 : Daudi cell lysate

Lysates/proteins at 10 µg per lane.

Predicted band size: 87 kDa

Western blot analysis of lysates (10 ug/lane) labelling beta Amyloid with ab2539 at 1/1000 overnight at 2-8°C. A HRP conjugated goat

anti-rabbit IgG secondary antibody (1/70,000) was used.

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