abcam

ab56980

Anti-NMNAT2 antibody [2E4]

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	pH: 7.4 Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	Recombinant Fragment Protein within Human NMNAT2 aa 200 to C-terminus. The exact immunogen used to generate this antibody is proprietary information. Database link Q9BZQ4
Carrier free	Yes
Clone number	2E4
Purity	Tissue culture supernatant
Light chain type	kappa
Purification notes	Purified from TCS.

Reactivity data

sELISA

Tested

Species	Recombinant fragment
Dilution info	-

Notes	-

Expected

Species	Human, Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

IHC-P

Tested

Species	Human
Dilution info	-
Notes	-

Expected

Species	Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

Flow Cyt

Tested

Species	Human
Dilution info	-
Notes	ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Expected

Species	Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

WB

Tested

Species	Recombinant fragment, Mouse
Dilution info	-
Notes	-

Expected

Species	Human
Dilution info	Use at an assay dependent concentration.
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	-
Notes	-

Expected

Species	Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

Target data

See full target information NMNAT2

Function

Nicotinamide/nicotinate-nucleotide adenylyltransferase that acts as an axon maintenance factor (By similarity). Axon survival factor required for the maintenance of healthy axons: acts by delaying Wallerian axon degeneration, an evolutionarily conserved process that drives the loss of damaged axons (By similarity). Catalyzes the formation of NAD(+) from nicotinamide mononucleotide (NMN) and ATP (PubMed:16118205, PubMed:17402747). Can also use the deamidated form; nicotinic acid mononucleotide (NaMN) as substrate but with a lower efficiency (PubMed:16118205, PubMed:17402747). Cannot use triazofurin monophosphate (TrMP) as substrate (PubMed:16118205, PubMed:17402747). Also catalyzes the reverse reaction, i.e. the pyrophosphorolytic cleavage of NAD(+) (PubMed:16118205, PubMed:17402747). For the pyrophosphorolytic activity prefers NAD(+), NADH and NaAD as substrates and degrades nicotinic acid adenine dinucleotide phosphate (NHD) less effectively (PubMed:16118205, PubMed:17402747). Fails to cleave phosphorylated dinucleotides NADP(+), NADPH and NaADP(+) (PubMed:16118205, PubMed:17402747). Also acts as an activator of ADP-ribosylation by supporting the catalytic activity of PARP16 and promoting mono-ADP-ribosylation of ribosomes by PARP16 (PubMed:34314702). May be involved in the maintenance of axonal integrity (By similarity).

Storage

Shipped at conditions	Blue Ice
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot

Storage information	Avoid freeze / thaw cycle

Notes

This product was changed from ascites to tissue culture supernatant on 15th May 2019. Please note that the dilutions may need to be adjusted accordingly. If you have any questions, please do not hesitate to contact our scientific support team.

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	NMNAT2 (nicotinamide nucleotide adenylyltransferase 2) is an enzyme that plays a role in the biosynthesis of NAD+ by converting nicotinamide mononucleotide (NMN) and ATP to NAD+ and pyrophosphate. It is also known in some contexts as NAD+ synthetase isoform 2. The molar mass of NMNAT2 is about 33 kDa. NMNAT2 expression occurs predominantly in the brain and nervous tissues where it contributes to cellular energy homeostasis and metabolism.
Biological function summary	NMNAT2 serves essential roles in maintaining NAD+ levels which are critical for numerous enzymatic processes within the cell including metabolism and cellular repair. This protein is not typically found as part of a larger complex but interacts with various cell compartments especially in neurons. NMNAT2 has been identified as an important player in axon maintenance and survival and it can protect against injury-induced degeneration.
Pathways	NMNAT2 is essential in the NAD+ biosynthesis pathway. It interfaces with several cellular functions tied to energy metabolism and repair processes. It often works alongside other related enzymes such as NAMPT (nicotinamide phosphoribosyltransferase) supporting the conversion of precursors into NAD+. NMNAT2 contributes to maintaining adequate energy levels within cells linking it closely with mitochondrial health and function.
Associated diseases and disorders	NMNAT2 is implicated in neurodegenerative conditions such as Alzheimer's disease and axonopathy. Its role in the nervous system relates to the prevention of axonal degeneration making it an important focus for research into potential therapeutic targets. Reduced NMNAT2 activity has been linked with elevated risk of neuronal damage and degeneration where its interaction with proteins like tau known for their association with Alzheimer's pathogenesis is significant.

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

We do not recommend this combination. It is not covered by our product promise.

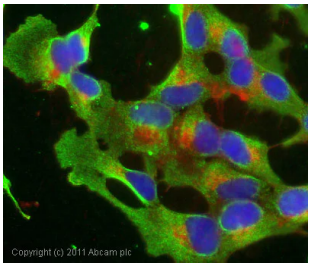
We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

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6 product images

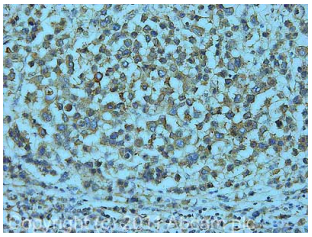


Immunocytochemistry/ Immunofluorescence - Anti-NMNAT2 antibody [2E4] (ab56980)

NMNAT2 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-NMNAT2 antibody

ICC/IF image of ab56980 stained SHSY5Y cells. The cells were 100% methanol fixed (5 min) and then incubated in 1%BSA / 10% normal goat serum / 0.3M glycine in 0.1% PBS-Tween for 1h to permeabilise the cells and block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab56980, 1µg/ml) overnight at +4°C. The secondary antibody (green) was Alexa Fluor® 488 goat anti-mouse IgG (H+L) used at a 1/1000 dilution for 1h. Alexa Fluor® 594 WGA was used to label plasma membranes (red) at a 1/200 dilution for 1h. DAPI was used to stain the cell nuclei (blue) at a concentration of 1.43µM.

This image was generated using the ascites version of the product.



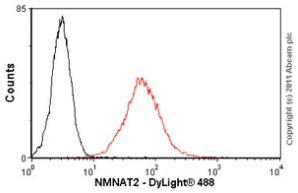
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-NMNAT2 antibody [2E4] (ab56980)

NMNAT2 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-NMNAT2 antibody

IHC image of ab56980 staining in human breast cancer formalin fixed paraffin embedded tissue section, performed on a Leica Bond™ system using the standard protocol F. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH6, epitope retrieval solution 1) for 20 mins. The section was then incubated with ab56980, 5µg/ml, for 15 mins at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX.

For other IHC staining systems (automated and non-automated) customers should optimize variable parameters such as antigen retrieval conditions, primary antibody concentration and antibody incubation times.

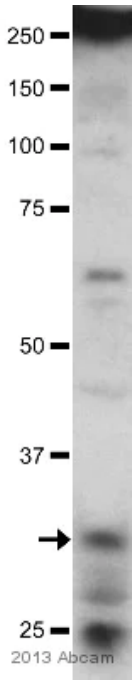
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Flow Cytometry - Anti-NMNAT2 antibody [2E4] (ab56980)

NMNAT2 Flow Cytometry staining using mouse Anti-NMNAT2 antibody

Overlay histogram showing SH-SY5Y cells stained with ab56980 (red line). The cells were fixed with 80% methanol (5 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab56980, 1µg/1x10^6 cells) for 30 min at 22°C. The secondary antibody used was DyLight® 488 goat anti-mouse IgG (H+L) (ab96879) at 1/500 dilution for 30 min at 22°C. Isotype control antibody (black line) was mouse IgG1 [ICIGG1] (ab91353, 2µg/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was performed. This antibody gave a positive signal in SH-SY5Y cells fixed with 4% paraformaldehyde (10 min)/permeabilized in 0.1% PBS-Tween used under the same conditions.
This image was generated using the ascites version of the product.



This image is courtesy of a customer review submitted by Jon Gilley, The Babraham Institute, United Kingdom

Western blot - Anti-NMNAT2 antibody [2E4] (ab56980)

Nmnat2 is a low abundance protein and is difficult to detect. Although multiple non-specific bands are detected by this antibody, we find it is the best commercial antibody for detecting endogenous Nmnat2 as the band is found approximately mid-way between the 25 and 37 kDa markers (at ~32 kDa) and can relatively easily be distinguished from nearby non-specific bands (N.B. a non-specific band at ~37 kDa is also detected in mouse brain extracts from adult mice). Importantly, we do not use this antibody in any immunostaining techniques due to its cross-reactivity with multiple other proteins. The size of the specific band corresponding to endogenous Nmnat2 (32 kDa) was determined based on its migration relative to that of FLAG-tagged Nmnat2 in tranfected HEK cells (which migrates slightly slower at ~34 kDa) and loss of the endogenous Nmnat2 band in transected axons in primary neuronal cultures and in gene trap mouse brain extracts (Gilley and Coleman, PLoS Biology, 2010 [PMID: 20126265]
This image was generated using the ascites version of the product.

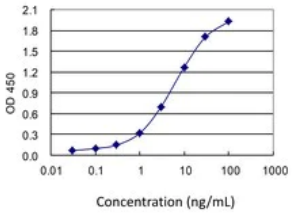
All lanes:
Western blot - Anti-NMNAT2 antibody [2E4] (ab56980) at 2 µg/mL

All lanes:
mouse brain from newborn pup at 40 µg

Secondary

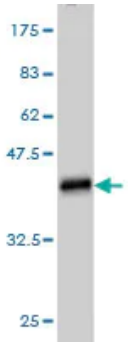
All lanes:
Goat Anti-Mouse IgG (H+L)-HRP Conjugate at 1/3000 dilution

Predicted band size: 34 kDa



Sandwich ELISA - Anti-NMNAT2 antibody [2E4] (ab56980)

Detection limit for recombinant GST tagged NMNAT2 is 0.03 ng/ml as a capture antibody.



Western blot - Anti-NMNAT2 antibody [2E4] (ab56980)

Western blot against tagged recombinant protein immunogen using ab56980 NMNAT2 antibody at 1ug/ml. Predicted band size of immunogen is 37 kDa
This image was generated using the ascites version of the product.

All lanes:
Western blot - Anti-NMNAT2 antibody [2E4] (ab56980)

Predicted band size: 34 kDa

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