abcam

ab181780

Anti-p95/NBS1 antibody [7E4C2]

KO Validated

Key facts

Isotype	IgG2a
Host species	Mouse
Storage buffer	Preservative: 0.05% Sodium azide Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	Recombinant Fragment Protein within Human NBN aa 450-650. The exact immunogen used to generate this antibody is proprietary information. Database link O60934
Clone number	7E4C2
Purification technique	Affinity purification Protein G
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →
Purification notes	Purified from tissue culture supernatant.

Reactivity data

Flow Cyt

Tested

Species	Human
Dilution info	1/200 - 1/400

Notes	ab170191 - Mouse monoclonal IgG2a, is suitable for use as an isotype control with this antibody.

WB

Tested

Species	Human
Dilution info	1/500 - 1/2000
Notes	-

IHC-P

Tested

Species	Human
Dilution info	1/200 - 1/1000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/200 - 1/1000
Notes	-

Target data

See full target information NBN

Function	Component of the MRN complex, which plays a central role in double-strand break (DSB) repair, DNA recombination, maintenance of telomere integrity and meiosis (PubMed:10888888, PubMed:15616588, PubMed:18411307, PubMed:18583988, PubMed:18678890, PubMed:19759395, PubMed:23115235, PubMed:28216226, PubMed:28867292, PubMed:9705271). The MRN complex is involved in the repair of DNA double-strand breaks (DSBs) via homologous recombination (HR), an error-free mechanism which primarily occurs during S and G2 phases (PubMed:19759395, PubMed:28867292, PubMed:9705271). The complex (1) mediates the end resection of damaged DNA, which generates proper single-stranded DNA, a key initial steps in HR, and is (2) required for the recruitment of

other repair factors and efficient activation of ATM and ATR upon DNA damage (PubMed:19759395, PubMed:9705271). The MRN complex possesses single-strand endonuclease activity and double-strand-specific 3'-5' exonuclease activity, which are provided by MRE11, to initiate end resection, which is required for single-strand invasion and recombination (PubMed:19759395, PubMed:28867292, PubMed:9705271). Within the MRN complex, NBN acts as a protein-protein adapter, which specifically recognizes and binds phosphorylated proteins, promoting their recruitment to DNA damage sites (PubMed:12419185, PubMed:15616588, PubMed:18411307, PubMed:18582474, PubMed:18583988, PubMed:18678890, PubMed:19759395, PubMed:19804756, PubMed:23762398, PubMed:24534091, PubMed:27814491, PubMed:27889449, PubMed:33836577). Recruits MRE11 and RAD50 components of the MRN complex to DSBs in response to DNA damage (PubMed:12419185, PubMed:18411307, PubMed:18583988, PubMed:18678890, PubMed:24534091, PubMed:26438602). Promotes the recruitment of PI3/PI4-kinase family members ATM, ATR, and probably DNA-PKcs to the DNA damage sites, activating their functions (PubMed:15064416, PubMed:15616588, PubMed:15790808, PubMed:16622404, PubMed:22464731, PubMed:30952868, PubMed:35076389). Mediates the recruitment of phosphorylated RBBP8/CtIP to DSBs, leading to cooperation between the MRN complex and RBBP8/CtIP to initiate end resection (PubMed:19759395, PubMed:27814491, PubMed:27889449, PubMed:33836577). RBBP8/CtIP specifically promotes the endonuclease activity of the MRN complex to clear DNA ends containing protein adducts (PubMed:27814491, PubMed:27889449, PubMed:30787182, PubMed:33836577). The MRN complex is also required for the processing of R-loops (PubMed:31537797). NBN also functions in telomere length maintenance via its interaction with TERF2: interaction with TERF2 during G1 phase preventing recruitment of DCLRE1B/Apollo to telomeres (PubMed:10888888, PubMed:28216226). NBN also promotes DNA repair choice at dysfunctional telomeres: NBN phosphorylation by CDK2 promotes non-homologous end joining repair at telomeres, while unphosphorylated NBN promotes microhomology-mediated end-joining (MMEJ) repair (PubMed:28216226). Enhances AKT1 phosphorylation possibly by association with the mTORC2 complex (PubMed:23762398).

Storage

Shipped at conditions	Blue Ice
Appropriate short-term storage duration	1-2 weeks
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

Supplementary info

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

Activity summary	The target known as p95/NBS1 also referred to as NBN protein is a critical component in the DNA damage response mechanism. The full molecular weight of the NBS1 protein is approximately 95 kDa. This protein is abundantly expressed in various tissues particularly where there is a higher rate of cell division or repair such as in the thymus and testis. It plays an important role in maintaining the stability of the genome through its involvement in the repair of double-strand breaks.
Biological function summary	The NBS1 protein functions as an essential component of the MRN complex which also includes MRE11 and RAD50 proteins. This complex is fundamental in accurately detecting DNA double-strand breaks and initiating repair processes. Through its actions NBS1 facilitates numerous cellular processes that preserve genomic integrity such as homologous recombination and non-homologous end joining. Its influence in controlling the cell cycle further emphasizes its role in maintaining cellular health.
Pathways	The NBS1 protein engages significantly in the DNA damage response and repair pathways notably impacting the ATM signaling pathway. By interacting with proteins such as ATM kinase NBS1 facilitates the phosphorylation and activation of several downstream effectors necessary for DNA repair and cell cycle checkpoints. The MRN complex also links with the RAD50 protein highlighting its involvement in these pathways.
Associated diseases and disorders	Mutations in the NBS1 gene are linked to Nijmegen breakage syndrome characterized by sensitivity to radiation immune deficiency and increased cancer risk. Additionally NBS1's role in pathways makes it pertinent to certain cancer pathologies where its malfunction can contribute to genomic instability. The NBN protein through its interaction with ATM and RAD50 assists in understanding its connection with predispositions to these diseases.

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

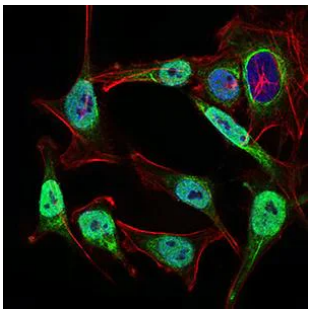
We do not recommend this combination. It is not covered by our product promise.

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.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

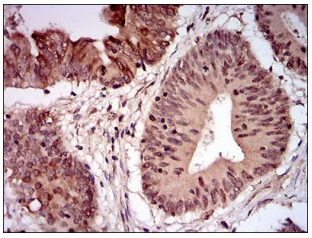
8 product images



Immunocytochemistry/ Immunofluorescence - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

P95/NBS1 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-p95/NBS1 antibody

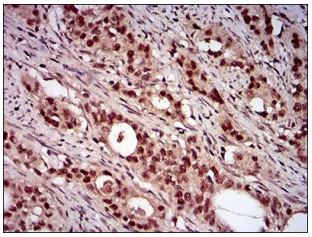
Immunofluorescent analysis of HeLa cells labeling p95/NBS1 with ab181780 at 1/200 dilution (green). Blue: DRAQ5 fluorescent DNA dye. Red: Actin filaments have been labeled with Alexa Fluor-555 phalloidin.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

P95/NBS1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-p95/NBS1 antibody

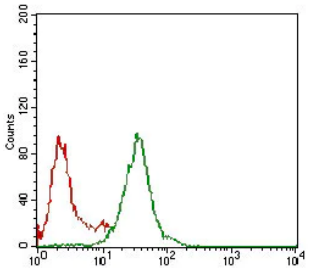
Immunohistochemical analysis of paraffin-embedded Human colon cancer tissue labeling p95/NBS1 with ab181780 at 1/200 dilution followed by DAB staining.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

P95/NBS1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-p95/NBS1 antibody

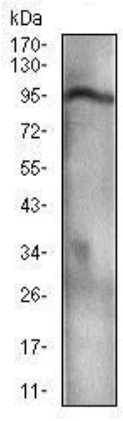
Immunohistochemical analysis of paraffin-embedded Human cervical cancer tissue labeling p95/NBS1 with ab181780 at 1/200 dilution followed by DAB staining.



Flow Cytometry - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

P95/NBS1 Flow Cytometry staining using mouse Anti-p95/NBS1 antibody

Flow cytometric analysis of HeLa cells labeling p95/NBS1 with ab181780 at 1/200 dilution (green); negative control (red).

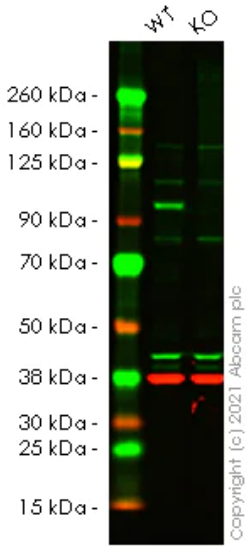


Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

All lanes:
Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780) at 1/500 dilution

All lanes:
Jurkat cell lysate

Predicted band size: 84 kDa



Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

P95/NBS1 Western blot staining using mouse Anti-p95/NBS1 antibody

False colour image of Western blot: Anti-p95/NBS1 antibody [7E4C2] staining at 1/500 dilution, shown in green; Rabbit Anti-GAPDH antibody [EPR16891] (ab181602) loading control staining at 1/20000 dilution, shown in red. In Western blot, ab181780 was shown to bind specifically to p95/NBS1. A band was observed at 95 kDa in wild-type A431 cell lysates with no signal observed at this size in NBN knockout cell line ab269506 (knockout cell lysate ab269668). To generate this image, wild-type and NBN knockout A431 cell lysates were analysed. First, samples were run on an SDS-PAGE gel then transferred onto a nitrocellulose membrane. Membranes were blocked in 3 % milk in TBS-0.1 % Tween® 20 (TBS-T) before incubation with primary antibodies overnight at 4°C. Blots were washed four times in TBS-T, incubated with secondary antibodies for 1 h at room temperature, washed again four times then imaged.Secondary antibodies used were Goat anti-Mouse IgG H&L (IRDye® 800CW) preabsorbed (ab216772) and Goat anti-Rabbit IgG H&L (IRDyeÂ® 680RD) preabsorbed (ab216777) at 1/20000 dilution.
All lanes:
Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780) at 1/500 dilution

Lane 1:
Wild-type A431 cell lysate at 20 µg

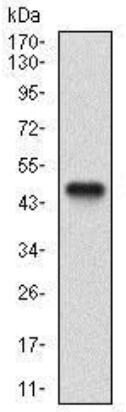
Lane 2:
NBN knockout A431 cell lysate at 20 µg

Lane 2:
Western blot - Human NBN (p95/NBS1) knockout A-431 cell line (ab269506)

Performed under reducing conditions.

Predicted band size: 84 kDa

Observed band size: 95 kDa

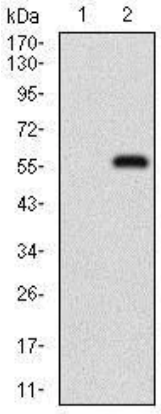


Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

All lanes:
Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780) at 1/500 dilution

All lanes:
Human p95/NBS1 recombinant protein (amino acids 467-615)

Predicted band size: 22 kDa, 37 kDa, 39 kDa, 84 kDa



Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780)

All lanes:
Western blot - Anti-p95/NBS1 antibody [7E4C2] (ab181780) at 1/500 dilution

Lane 1:
HEK293 cell lysate, non-transfected

Lane 2:
HEK293 cell lysate, transfected with p95/NBS1 (amino acids 467-615)-hIgGFc

Predicted band size: 84 kDa

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