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NBN Antibody (C-term)

Affinity Purified Rabbit Polyclonal Antibody (Pab)
Catalog # AP11776b

Product Information

Application	WB, IF, FC, E
Primary Accession	O60934
Other Accession	NP_002476.2
Reactivity	Human
Host	Rabbit
Clonality	Polyclonal
Isotype	Rabbit IgG
Clone Names	RB19072
Calculated MW	84959
Antigen Region	602-630

Additional Information

Gene ID	4683
Other Names	Nibrin, Cell cycle regulatory protein p95, Nijmegen breakage syndrome protein 1, NBN, NBS, NBS1, P95
Target/Specificity	This NBN antibody is generated from rabbits immunized with a KLH conjugated synthetic peptide between 602-630 amino acids from the C-terminal region of human NBN.
Dilution	WB~~1:1000 IF~~1:10~50 FC~~1:10~50 E~~Use at an assay dependent concentration.
Format	Purified polyclonal antibody supplied in PBS with 0.05% (V/V) Proclin 300. This antibody is prepared by Saturated Ammonium Sulfate (SAS) precipitation followed by dialysis against PBS.
Storage	Maintain refrigerated at 2-8°C for up to 2 weeks. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.
Precautions	NBN Antibody (C-term) is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	NBN (HGNC:7652)
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).

Cellular Location

Nucleus. Chromosome. Nucleus, PML body. Chromosome, telomere Note=Localizes to discrete nuclear foci after treatment with genotoxic agents (PubMed:10783165, PubMed:26215093, PubMed:26438602). Localizes to DNA double-strand breaks (DSBs); recruited to DNA damage sites via association with phosphorylated proteins, such as phosphorylated H2AX, phosphorylated MDC1 and phosphorylated RAD17 (PubMed:12419185, PubMed:18411307, PubMed:18582474, PubMed:18583988, PubMed:18678890, PubMed:19338747, PubMed:23115235, PubMed:24534091, PubMed:26438602) Acetylation of 'Lys-5' of histone H2AX (H2AXK5ac) promotes NBN/NBS1 assembly at the sites of DNA damage (PubMed:26438602)

Tissue Location

Ubiquitous (PubMed:9590180). Expressed at high levels in testis (PubMed:9590180).

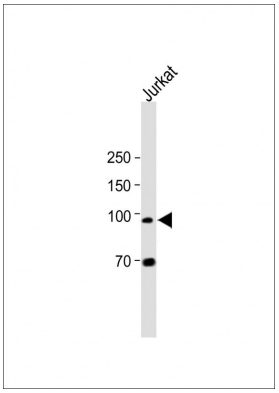
Background

Mutations in this gene are associated with Nijmegen breakage syndrome, an autosomal recessive chromosomal instability syndrome characterized by microcephaly, growth retardation, immunodeficiency, and cancer predisposition. The encoded protein is a member of the MRE11/RAD50 double-strand break repair complex which consists of 5 proteins. This gene product is thought to be involved in DNA double-strand break repair and DNA damage-induced checkpoint activation.

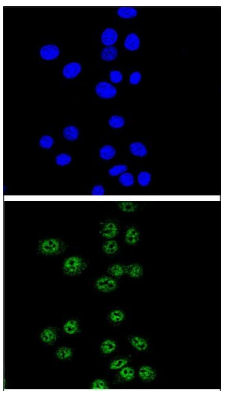
References

Liu, Y., et al. Carcinogenesis 31(10):1762-1769(2010)
Kavitha, C.V., et al. Biochem. Biophys. Res. Commun. 399(4):575-580(2010)
Ho-Pun-Cheung, A., et al. Pharmacogenomics J. (2010) In press :
Jelonek, K., et al. J. Appl. Genet. 51(3):343-352(2010)
Jugessur, A., et al. PLoS ONE 5 (7), E11493 (2010) :

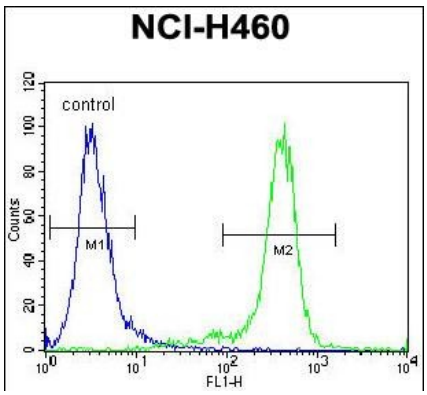
Images



All lanes : Anti-NBN Antibody (C-term) at 1:2000 dilution Lane 1: Jurkat whole cell lysate Lysates/proteins at 20 µg per lane. Secondary Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated (ASP1615) at 1/15000 dilution. Observed band size : 100kDa Blocking/Dilution buffer: 13% NFDM/TBST.



Confocal immunofluorescent analysis of NBN Antibody (C-term) (Cat. #AP11776b) with Hela cell followed by Alexa Fluor® 488-conjugated goat anti-rabbit lgG (green). DAPI was used to stain the cell nuclear (blue).



NBN Antibody (C-term) (Cat. #AP11776b) flow cytometric analysis of NCI-H460 cells (right histogram) compared to a negative control cell (left histogram).FITC-conjugated goat-anti-rabbit secondary antibodies were used for the analysis.