

**NBN Antibody**  
**Purified Mouse Monoclonal Antibody**  
**Catalog # AO1907a**

**Specification**

**NBN Antibody - Product Information**

Application	<b>E, WB, IF, FC, IHC</b>
Primary Accession	<a href="#">O60934</a>
Reactivity	<b>Human</b>
Host	<b>Mouse</b>
Clonality	<b>Monoclonal</b>
Isotype	<b>IgG2a</b>
Calculated MW	<b>85kDa KDa</b>

**Description**

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.

**Immunogen**

Purified recombinant fragment of human NBN (AA: 467-615) expressed in E. Coli.

**Formulation**

Purified antibody in PBS with 0.05% sodium azide.

**NBN Antibody - Additional Information**

**Gene ID** 4683

**Other Names**

Nibrin, Cell cycle regulatory protein p95, Nijmegen breakage syndrome protein 1, NBN, NBS, NBS1, P95

**Dilution**

E~~1/10000  
WB~~1/500 - 1/2000  
IF~~1/200 - 1/1000  
FC~~1/200 - 1/400  
IHC~~1/200 - 1/1000

**Storage**

Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.

**Precautions**

NBN Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

## NBN Antibody - 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](http://www.uniprot.org/citations/10888888), PubMed: [15616588](http://www.uniprot.org/citations/15616588), PubMed: [18411307](http://www.uniprot.org/citations/18411307), PubMed: [18583988](http://www.uniprot.org/citations/18583988), PubMed: [18678890](http://www.uniprot.org/citations/18678890), PubMed: [19759395](http://www.uniprot.org/citations/19759395), PubMed: [23115235](http://www.uniprot.org/citations/23115235), PubMed: [28216226](http://www.uniprot.org/citations/28216226), PubMed: [28867292](http://www.uniprot.org/citations/28867292), PubMed: [9705271](http://www.uniprot.org/citations/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](http://www.uniprot.org/citations/19759395), PubMed: [28867292](http://www.uniprot.org/citations/28867292), PubMed: [9705271](http://www.uniprot.org/citations/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](http://www.uniprot.org/citations/19759395), PubMed: [9705271](http://www.uniprot.org/citations/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](http://www.uniprot.org/citations/19759395), PubMed: [28867292](http://www.uniprot.org/citations/28867292), PubMed: [9705271](http://www.uniprot.org/citations/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](http://www.uniprot.org/citations/12419185), PubMed: [15616588](http://www.uniprot.org/citations/15616588), PubMed: [18411307](http://www.uniprot.org/citations/18411307), PubMed: [18582474](http://www.uniprot.org/citations/18582474), PubMed: [18583988](http://www.uniprot.org/citations/18583988), PubMed: [18678890](http://www.uniprot.org/citations/18678890), PubMed: [19759395](http://www.uniprot.org/citations/19759395), PubMed: [19804756](http://www.uniprot.org/citations/19804756), PubMed: [23762398](http://www.uniprot.org/citations/23762398), PubMed: [24534091](http://www.uniprot.org/citations/24534091), PubMed: [27814491](http://www.uniprot.org/citations/27814491), PubMed: [27889449](http://www.uniprot.org/citations/27889449), PubMed: [33836577](http://www.uniprot.org/citations/33836577)). Recruits MRE11 and RAD50 components of the MRN complex to DSBs in response to DNA damage (PubMed: [12419185](http://www.uniprot.org/citations/12419185), PubMed: [18411307](http://www.uniprot.org/citations/18411307), PubMed: [18583988](http://www.uniprot.org/citations/18583988), PubMed: [18678890](http://www.uniprot.org/citations/18678890), PubMed: [24534091](http://www.uniprot.org/citations/24534091), PubMed: [26438602](http://www.uniprot.org/citations/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:<a href="http://www.uniprot.org/citations/15064416" target="\_blank">15064416</a>, PubMed:<a href="http://www.uniprot.org/citations/15616588" target="\_blank">15616588</a>, PubMed:<a href="http://www.uniprot.org/citations/15790808" target="\_blank">15790808</a>, PubMed:<a href="http://www.uniprot.org/citations/16622404" target="\_blank">16622404</a>, PubMed:<a href="http://www.uniprot.org/citations/22464731" target="\_blank">22464731</a>, PubMed:<a href="http://www.uniprot.org/citations/30952868" target="\_blank">30952868</a>, PubMed:<a href="http://www.uniprot.org/citations/35076389" target="\_blank">35076389</a>). Mediates the recruitment of phosphorylated RBBP8/CtIP to DSBs, leading to cooperation between the MRN complex and RBBP8/CtIP to initiate end resection (PubMed:<a href="http://www.uniprot.org/citations/19759395" target="\_blank">19759395</a>, PubMed:<a href="http://www.uniprot.org/citations/27814491" target="\_blank">27814491</a>, PubMed:<a href="http://www.uniprot.org/citations/27889449" target="\_blank">27889449</a>, PubMed:<a href="http://www.uniprot.org/citations/33836577" target="\_blank">33836577</a>). RBBP8/CtIP specifically promotes the endonuclease activity of the MRN complex to clear DNA ends containing protein adducts (PubMed:<a href="http://www.uniprot.org/citations/27814491" target="\_blank">27814491</a>, PubMed:<a href="http://www.uniprot.org/citations/27889449" target="\_blank">27889449</a>, PubMed:<a href="http://www.uniprot.org/citations/30787182" target="\_blank">30787182</a>, PubMed:<a href="http://www.uniprot.org/citations/33836577" target="\_blank">33836577</a>). The MRN complex is also required for the processing of R-loops (PubMed:<a href="http://www.uniprot.org/citations/31537797" target="\_blank">31537797</a>). 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:<a href="http://www.uniprot.org/citations/10888888" target="\_blank">10888888</a>, PubMed:<a href="http://www.uniprot.org/citations/28216226" target="\_blank">28216226</a>). NBN also promotes DNA repair choice at dysfunctional telomeres: NBN phosphorylation by CK2 promotes non-homologous end joining repair at telomeres, while unphosphorylated NBN promotes microhomology-mediated end-joining (MMEJ) repair (PubMed:<a href="http://www.uniprot.org/citations/28216226" target="\_blank">28216226</a>). Enhances AKT1 phosphorylation possibly by association with the mTORC2 complex (PubMed:<a href="http://www.uniprot.org/citations/23762398" target="\_blank">23762398</a>).

### 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).

### NBN Antibody - Protocols

Provided below are standard protocols that you may find useful for product applications.

- [Western Blot](#)
- [Blocking Peptides](#)
- [Dot Blot](#)
- [Immunohistochemistry](#)
- [Immunofluorescence](#)

- [Immunoprecipitation](#)
- [Flow Cytometry](#)
- [Cell Culture](#)

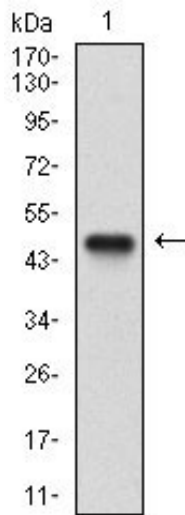
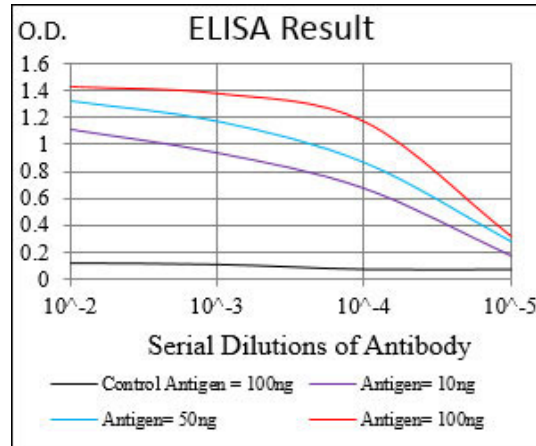


Figure 1: Western blot analysis using NBN mAb against human NBN (AA: 467-615) recombinant protein. (Expected MW is 44.3 kDa)

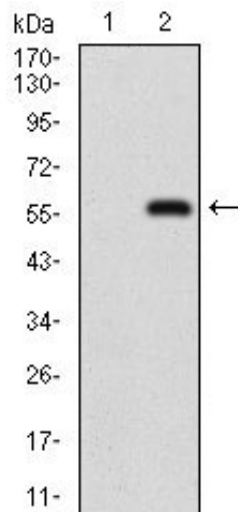


Figure 2: Western blot analysis using NBN mAb against HEK293 (1) and NBN (AA: 467-615)-hIgGFc transfected HEK293 (2) cell lysate.

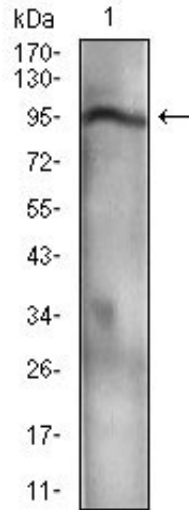


Figure 3: Western blot analysis using NBN mouse mAb against Jurkat (1) cell lysate.

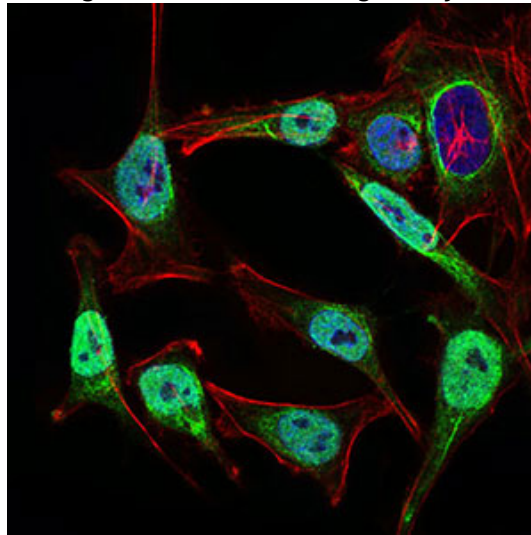


Figure 4: Immunofluorescence analysis of HeLa cells using NBN mouse mAb (green). Blue: DRAQ5 fluorescent DNA dye. Red: Actin filaments have been labeled with Alexa Fluor-555 phalloidin. Secondary antibody from Fisher (Cat#: 35503)

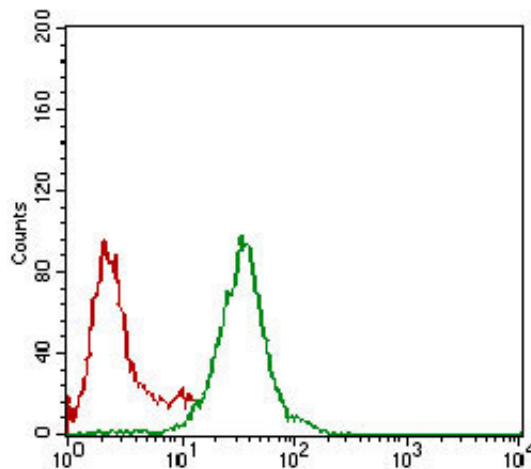


Figure 5: Flow cytometric analysis of HeLa cells using NBN mouse mAb (green) and negative control (red).

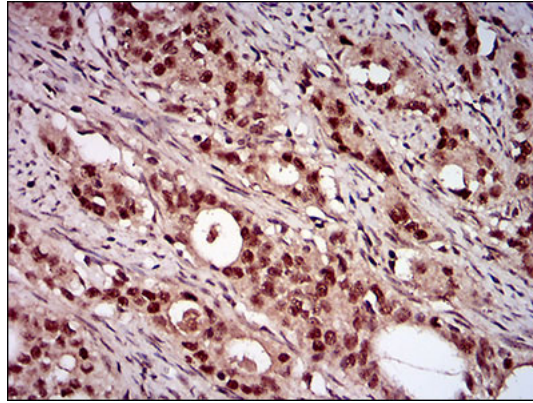


Figure 6: Immunohistochemical analysis of paraffin-embedded cervical cancer tissues using NBN mouse mAb with DAB staining.

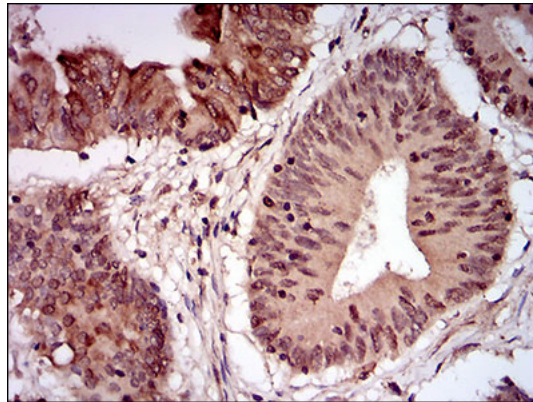


Figure 7: Immunohistochemical analysis of paraffin-embedded colon cancer tissues using NBN mouse mAb with DAB staining.

### **NBN Antibody - Background**

The protein encoded by this gene is a member of the nerve growth factor family. It is induced by cortical neurons, and is necessary for survival of striatal neurons in the brain. Expression of this gene is reduced in both Alzheimer's and Huntington disease patients. This gene may play a role in the regulation of stress response and in the biology of mood disorders. Multiple transcript variants encoding distinct isoforms have been described for this gene. ;

### **NBN Antibody - References**

1. Fam Cancer. 2012 Dec;11(4):595-600.
2. Mol Carcinog. 2011 Sep;50(9):689-96.