

**NBN / Nibrin Antibody (clone 1D7)**  
**Mouse Monoclonal Antibody**  
**Catalog # ALS11863****Specification**

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**NBN / Nibrin Antibody (clone 1D7) - Product Information**

Application	IHC
Primary Accession	<a href="#">O60934</a>
Reactivity	Human
Host	Mouse
Clonality	Monoclonal
Calculated MW	85kDa KDa

**NBN / Nibrin Antibody (clone 1D7) - Additional Information****Gene ID** 4683**Other Names**

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

**Target/Specificity**

The complete coding region of the human p95/NBS1 expressed in E. coli.

**Reconstitution & Storage**

+4°C or -20°C, Avoid repeated freezing and thawing.

**Precautions**

NBN / Nibrin Antibody (clone 1D7) is for research use only and not for use in diagnostic or therapeutic procedures.

**NBN / Nibrin Antibody (clone 1D7) - 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:<a href="http://www.uniprot.org/citations/10888888" target="\_blank">10888888</a>, PubMed:<a href="http://www.uniprot.org/citations/15616588" target="\_blank">15616588</a>, PubMed:<a href="http://www.uniprot.org/citations/18411307" target="\_blank">18411307</a>, PubMed:<a href="http://www.uniprot.org/citations/18583988" target="\_blank">18583988</a>, PubMed:<a href="http://www.uniprot.org/citations/18678890" target="\_blank">18678890</a>, PubMed:<a href="http://www.uniprot.org/citations/19759395" target="\_blank">19759395</a>, PubMed:<a href="http://www.uniprot.org/citations/23115235" target="\_blank">23115235</a>, PubMed:<a href="http://www.uniprot.org/citations/28216226" target="\_blank">28216226</a>, PubMed:<a href="http://www.uniprot.org/citations/28867292" target="\_blank">28867292</a>, PubMed:<a href="http://www.uniprot.org/citations/9705271" target="\_blank">9705271</a>). 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:<a href="http://www.uniprot.org/citations/19759395" target="\_blank">19759395</a>, PubMed:<a href="http://www.uniprot.org/citations/28867292" target="\_blank">28867292</a>, PubMed:<a href="http://www.uniprot.org/citations/9705271" target="\_blank">9705271</a>). 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:<a href="http://www.uniprot.org/citations/19759395" target="\_blank">19759395</a>, PubMed:<a href="http://www.uniprot.org/citations/9705271" target="\_blank">9705271</a>). 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:<a href="http://www.uniprot.org/citations/19759395" target="\_blank">19759395</a>, PubMed:<a href="http://www.uniprot.org/citations/28867292" target="\_blank">28867292</a>, PubMed:<a href="http://www.uniprot.org/citations/9705271" target="\_blank">9705271</a>). 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:<a href="http://www.uniprot.org/citations/12419185" target="\_blank">12419185</a>, PubMed:<a href="http://www.uniprot.org/citations/15616588" target="\_blank">15616588</a>, PubMed:<a href="http://www.uniprot.org/citations/18411307" target="\_blank">18411307</a>, PubMed:<a href="http://www.uniprot.org/citations/18582474" target="\_blank">18582474</a>, PubMed:<a href="http://www.uniprot.org/citations/18583988" target="\_blank">18583988</a>, PubMed:<a href="http://www.uniprot.org/citations/18678890" target="\_blank">18678890</a>, PubMed:<a href="http://www.uniprot.org/citations/19759395" target="\_blank">19759395</a>, PubMed:<a href="http://www.uniprot.org/citations/19804756" target="\_blank">19804756</a>, PubMed:<a href="http://www.uniprot.org/citations/23762398" target="\_blank">23762398</a>, PubMed:<a href="http://www.uniprot.org/citations/24534091" target="\_blank">24534091</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>). Recruits MRE11 and RAD50 components of the MRN complex to DSBs in response to DNA damage (PubMed:<a href="http://www.uniprot.org/citations/12419185" target="\_blank">12419185</a>, PubMed:<a href="http://www.uniprot.org/citations/18411307" target="\_blank">18411307</a>, PubMed:<a href="http://www.uniprot.org/citations/18583988" target="\_blank">18583988</a>, PubMed:<a href="http://www.uniprot.org/citations/18678890" target="\_blank">18678890</a>, PubMed:<a href="http://www.uniprot.org/citations/24534091" target="\_blank">24534091</a>, PubMed:<a href="http://www.uniprot.org/citations/26438602" target="\_blank">26438602</a>). 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>).

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

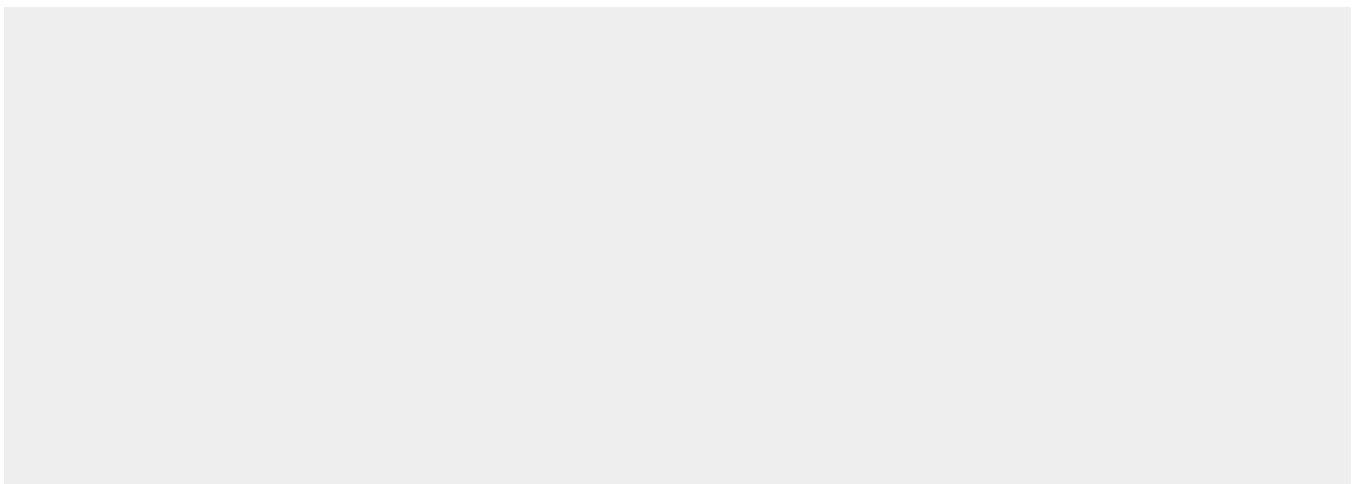
Ubiquitous (PubMed:9590180). Expressed at high levels in testis (PubMed:9590180).

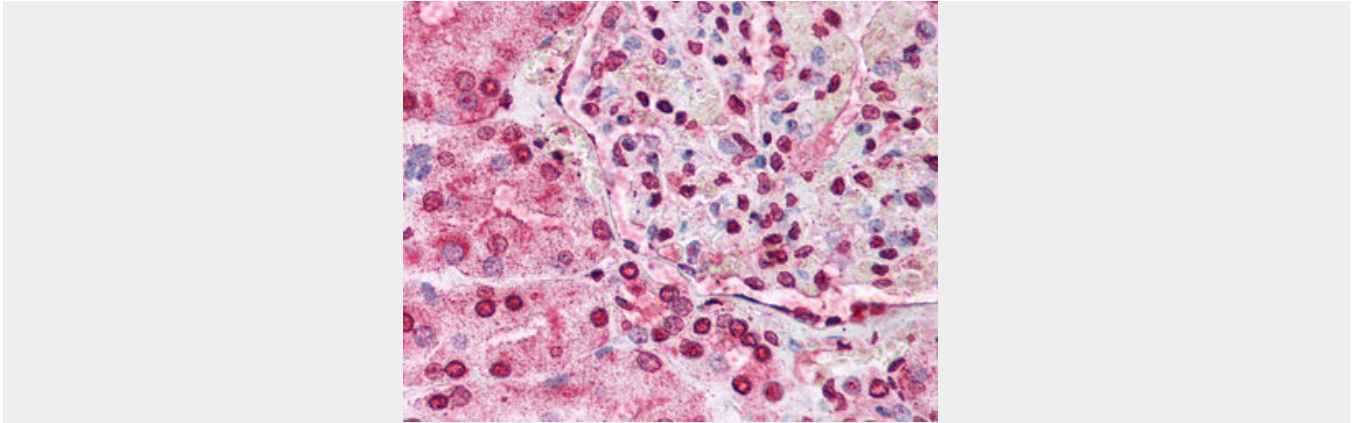
### NBN / Nibrin Antibody (clone 1D7) - Protocols

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](#)

### NBN / Nibrin Antibody (clone 1D7) - Images





Anti-NBN / Nibrin antibody IHC of human kidney.

### **NBN / Nibrin Antibody (clone 1D7) - Background**

Component of the MRE11-RAD50-NBN (MRN complex) which plays a critical role in the cellular response to DNA damage and the maintenance of chromosome integrity. The complex is involved in double-strand break (DSB) repair, DNA recombination, maintenance of telomere integrity, cell cycle checkpoint control and meiosis. The complex possesses single-strand endonuclease activity and double-strand-specific 3'-5' exonuclease activity, which are provided by MRE11A. RAD50 may be required to bind DNA ends and hold them in close proximity. NBN modulate the DNA damage signal sensing by recruiting PI3/PI4-kinase family members ATM, ATR, and probably DNA-PKcs to the DNA damage sites and activating their functions. It can also recruit MRE11 and RAD50 to the proximity of DSBs by an interaction with the histone H2AX. NBN also functions in telomere length maintenance by generating the 3' overhang which serves as a primer for telomerase dependent telomere elongation. NBN is a major player in the control of intra-S-phase checkpoint and there is some evidence that NBN is involved in G1 and G2 checkpoints. The roles of NBS1/MRN encompass DNA damage sensor, signal transducer, and effector, which enable cells to maintain DNA integrity and genomic stability. Forms a complex with RBBP8 to link DNA double-strand break sensing to resection. Enhances AKT1 phosphorylation possibly by association with the mTORC2 complex.

### **NBN / Nibrin Antibody (clone 1D7) - References**

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- Carney J.P., et al. Cell 93:477-486(1998).
- Matsuura S., et al. Nat. Genet. 19:179-181(1998).
- Tauchi H., et al. Genomics 55:242-247(1999).
- Ota T., et al. Nat. Genet. 36:40-45(2004).