# ATM phosphorylates NBN

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# Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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## Literature references

Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics, 18*, 142. ↗

Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

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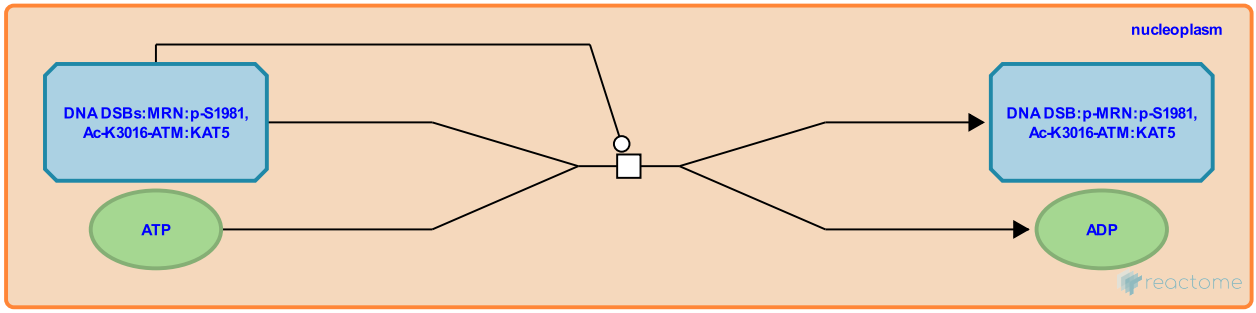
## ATM phosphorylates NBN ↗

**Stable identifier:** R-HSA-5693598

**Type:** transition

**Compartments:** nucleoplasm




NSB1 (NBN) is a component of the MRN (MRE11:RAD50:NBN) complex which acts early in homologous recombination repair (HRR) during recognition and resection of double-strand breaks (DSBs). ATM-mediated phosphorylation of NBN at serine residue S343 is required for activation of the S-phase checkpoint in response to ionizing radiation (IR), ATM-dependent activation of CHK2 and cell survival after exposure to IR (Lim et al. 2000, Gatei et al. 2000, Lee and Paull 2004). The phosphorylation of NBN by ATM may be enhanced by the presence of BRCA1 (Foray et al. 2003).

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## Editions

| | | |
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