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ATM Antibody

Catalog # ASC10463

Product Information

Application	WB, IF, E, IHC-P
Primary Accession	Q13315
Other Accession	AAB65827, 2304971
Reactivity	Human
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	350687
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	ATM antibody can be used for detection of ATM by Western blot at 1 - 2 g/mL. Antibody can also be used for immunohistochemistry starting at 2.5 g/mL. For immunofluorescence start at 10 g/mL.

Additional Information

Gene ID	472
Other Names	ATM Antibody: AT1, ATA, ATC, ATD, ATE, ATDC, TEL1, TELO1, Serine-protein kinase ATM, Ataxia telangiectasia mutated, A-T mutated, ataxia telangiectasia mutated
Target/Specificity	ATM;
Reconstitution & Storage	ATM antibody can be stored at 4℃ for three months and -20℃, stable for up to one year. As with all antibodies care should be taken to avoid repeated freeze thaw cycles. Antibodies should not be exposed to prolonged high temperatures.
Precautions	ATM Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	ATM
Function	Serine/threonine protein kinase which activates checkpoint signaling upon double strand breaks (DSBs), apoptosis and genotoxic stresses such as ionizing ultraviolet A light (UVA), thereby acting as a DNA damage sensor (PubMed:10550055, PubMed:10839545, PubMed:10910365, PubMed:12556884, PubMed:14871926, PubMed:15064416, PubMed:15448695, PubMed:15456891, PubMed:15790808, PubMed:15916964, PubMed:17923702, PubMed:21757780, PubMed:24534091, PubMed:35076389, PubMed:9733514). Recognizes the

	substrate consensus sequence [ST]-Q (PubMed:10550055, PubMed:10839545, PubMed:10910365, PubMed:12556884, PubMed:14871926, PubMed:15448695, PubMed:15456891, PubMed:15916964, PubMed:17923702, PubMed:24534091, PubMed:9733514). Phosphorylates 'Ser-139' of histone variant H2AX at double strand breaks (DSBs), thereby regulating DNA damage response mechanism (By similarity). Also plays a role in pre-B cell allelic exclusion, a process leading to expression of a single immunoglobulin heavy chain allele to enforce clonality and monospecific recognition by the B-cell antigen receptor (BCR) expressed on individual B-lymphocytes. After the introduction of DNA breaks by the RAG complex on one immunoglobulin allele, acts by mediating a repositioning of the second allele to pericentromeric heterochromatin, preventing accessibility to the RAG complex and recombination of the second allele. Also involved in signal transduction and cell cycle control. May function as a tumor suppressor. Necessary for activation of ABL1 and SAPK. Phosphorylates DYRK2, CHEK2, p53/TP53, FBXW7, FANCD2, NFKBIA, BRCA1, CREBBP/CBP, RBBP8/CTIP, FBXO46, MRE11, nibrin (NBN), RAD50, RAD17, PELI1, TERF1, UFL1, RAD9, UBQLN4 and DCLRE1C (PubMed:10550055, PubMed:10766245, PubMed:10802669, PubMed:10839545, PubMed:10910365, PubMed:10973490, PubMed:11375976, PubMed:12086603, PubMed:15456891, PubMed:19965871, PubMed:21757780, PubMed:24534091, PubMed:26240375, PubMed:26774286, PubMed:30171069, PubMed:30612738, PubMed:30886146, PubMed:30952868, PubMed:38128537, PubMed:9733515, PubMed:9843217). May play a role in vesicle and/or protein transport. Could play a role in T-cell development, gonad and neurological function. Plays a role in replication-dependent histone mRNA degradation. Binds DNA ends. Phosphorylation of DYRK2 in nucleus in response to genotoxic stress prevents its MDM2-mediated ubiquitination and subsequent proteasome degradation (PubMed:19965871). Phosphorylates ATF2 which stimulates its function in DNA damage response (PubMed:15916964). Phosphorylates ERCC6 which is essential for its chromatin remodeling activity at DNA double-strand breaks (PubMed:29203878). Phosphorylates TTC5/STRAP at 'Ser-203' in the cytoplasm in response to DNA damage, which promotes TTC5/STRAP nuclear localization (PubMed:15448695). Also involved in pexophagy by mediating phosphorylation of PEX5: translocated to peroxisomes in response to reactive oxygen species (ROS), and catalyzes phosphorylation of PEX5, promoting PEX5 ubiquitination and induction of pexophagy (PubMed:26344566).
Cellular Location	Nucleus. Cytoplasmic vesicle. Cytoplasm, cytoskeleton, microtubule organizing center, centrosome {ECO:0000250|UniProtKB:Q62388}. Peroxisome matrix. Note=Primarily nuclear (PubMed:9050866, PubMed:9150358). Found also in endocytic vesicles in association with beta-adaptin (PubMed:9707615). Translocated to peroxisomes in response to reactive oxygen species (ROS) by PEX5 (PubMed:26344566)
Tissue Location	Found in pancreas, kidney, skeletal muscle, liver, lung, placenta, brain, heart, spleen, thymus, testis, ovary, small intestine, colon and leukocytes

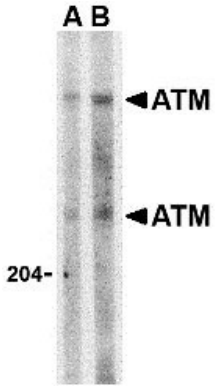
Background

ATM Antibody: DNA double strand breaks represent a major threat to an organism's genome. Eukaryotic cells have developed mechanisms that sense the presence this damage and initiate suitable responses that can include DNA repair, cell cycle delay, and programmed cell death. The ATM (mutated in Ataxia-Telangiectasia) protein kinase is activated following the formation of DNA double strand breaks, phosphorylating p53 and another kinase CHK2. This initiates a signaling cascade leading to the phosphorylation and inhibition of Cdc25, ultimately preventing cell cycle progression. In some cell types, such as the hemapoietic system, this leads to apoptosis instead of cell cycle arrest. Multiple isoforms of ATM are known to exist.

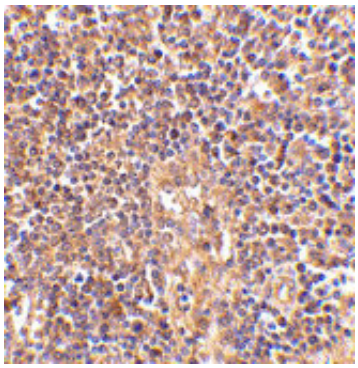
References

Cahill D, Connor B, and Carney JP. Mechanisms of eukaryotic DNA double strand break repair. Front. Biosci. 2006 ; 11 :1958-76.
Dasika GK, Lis SC, Zhao S, et al. DNA damage-induced cell cycle checkpoints and DNA strand break repair in development and tumorigenesis. Oncogene 1999; 18:7883-99.

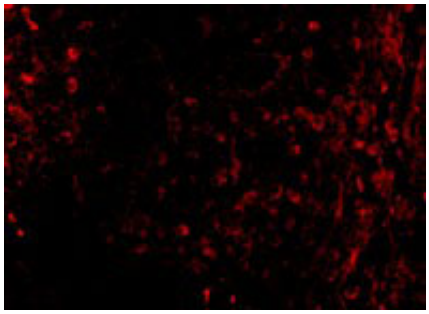
Images



Western blot analysis of ATM in Daudi whole cell lysate with ATM antibody at (A) 1 and (B) 2 µg/mL.



Immunohistochemistry of ATM in human lymph node tissue with ATM antibody at 2.5 µg/mL.



Immunofluorescence of ATM in Human Lymph Node cells with ATM antibody at 10 µg/mL.