Order online now!

www.rockland.com
tech@rockland.com
+1 484.791.3823

Datasheet for 200-301-500

ATM phospho S1981 Antibody

Overview

Description:	Anti-ATM Protein Kinase pS1981 (MOUSE) Monoclonal Antibody - 200-301-500
Item No.:	200-301-500
Size:	100 µg
Applications:	ELISA, IHC, IF, IP, Multiplex, WB
Reactivity:	Human, Mouse
Host Species:	Mouse

Product Details

Background:	Anti ATM pS1981 Antibody recognizes the product of the ATM gene that is mutated in the hereditary disease ataxia-telangiectasia. ATM codes for a protein kinase that acts as a master regulator of cellular responses to DNA double-strand breaks. ATM is normally inactive and the question of how it is activated in the event of DNA damage (due to ionizing radiation for instance) is central to understanding its function. ATM protein is now shown to be present in undamaged cells as an inactive dimer. Low doses of ionizing radiation, which induce only a few DNA breaks, activate at least half of the total ATM protein present, possibly in response to changes in chromatin structure. The ATM gene encodes a 370-kDa protein that belongs to the phosphoinositide 3-kinase (PI(3)K) superfamily, but which phosphorylates proteins rather than lipids. The 350-amino-acid kinase domain at the carboxy terminus of this large protein is the only segment of ATM with an assigned function. Exposure of cells to IR triggers ATM kinase activity, and this function is required for arrests in G1, S and G2 phases of the cell cycle. Several substrates of the ATM kinase participate in these IR-induced cell-cycle arrests. These include p53, Mdm2 and Chk2 in the G1 checkpoint; Nbs1, Brca1, FancD2 and SMC1 in the transient IR-induced S-phase arrest; and Brca1 and hRad17 in the G2/M checkpoint. See Bakkenist, C. J. & Kastan, M. B. Nature 421, 499-506 (2003) for a complete presentation of this antibody's specificity and utility.
Synonyms:	mouse anti-ATM antibody, mouse anti-ATMpS1981 antibody, mouse anti- ATM pS1981 antibody, DKFZp781A0353 antibody, Human phosphatidylinositol 3 kinase homolog antibody, MGC74674 antibody, Serine protein kinase ATM antibody, T cell prolymphocytic leukemia antibody
Host Species:	Mouse
Clonality:	Monoclonal

Clone ID:	7C10D8
Format:	IgG2a

Target Details

Gene Name:	ATM
Reactivity:	Human, Mouse
PTM Specificity:	Phosphorylation
Immunogen Type:	Conjugated Peptide
Immunogen:	This antibody was produced from a synthetic peptide S-L-A-F-E-E-G-Sp-Q-S-T-T-I-S-S corresponding to aa 1974-1988 of human ATM.
Purity/Specificity:	This Protein A Purified Mab antibody is directed against human ATM and is useful in determining its presence by immunohistochemistry. This monoclonal anti-ATM antibody recognizes the phosphorylated form of the protein in native and over-expressed proteins found in various tissues and extracts. Reactivity is observed against human and mouse ATM. Cross reactivity with ATM from other mammalian sources has not been tested.
Relevant Links:	• UniProtKB - Q13315 • NCBI - NP_000042.3 • GeneID - 472

Application Details

Tested Applications:	ELISA, IHC
Suggested Applications:	IF, IP, Multiplex, WB (Based on references)
Application Note:	Anti-ATM Protein Kinase pS1981 (MOUSE) Monoclonal Antibody clone has been tested by ELISA and optimized for IHC, but may also be suitable for Western blot, flow cytometry, immunoprecipitation, and immunofluorescence microscopy. Indirect immunoperoxidase staining on formaldehyde-fixed, de-paraffinized tissue sections and/or formalin-fixed cultured cells are recommended when using this antibody as described in Bartkova et al 2005. Product item# 200-301-400 produced from clone 10H11.E12 has been optimized for WB, IP and IF.
Assay Dilutions:	All assays should be optimized by the user. Recommended dilutions (if any) may be listed below.
ELISA:	1:10,000 - 1:50,000
FC:	User Optimized
IHC:	1:100 - 1:500

WB:	1:500- 1:2,000

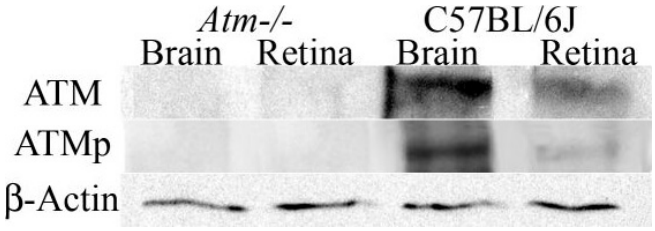
Formulation

Physical State:	Liquid (sterile filtered)
Concentration:	1.0 mg/mL by UV absorbance at 280 nm
Buffer:	0.02 M Potassium Phosphate, 0.15 M Sodium Chloride, pH 7.2
Preservative:	0.01% (w/v) Sodium Azide
Stabilizer:	None

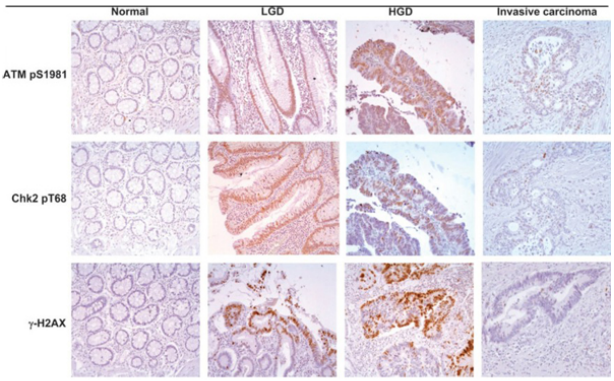
Shipping & Handling

Shipping Condition:	Dry Ice
Storage Condition:	Store vial at -20° C prior to opening. Aliquot contents and freeze at -20° C or below for extended storage. Avoid cycles of freezing and thawing. Centrifuge product if not completely clear after standing at room temperature. This product is stable for several weeks at 4° C as an undiluted liquid. Dilute only prior to immediate use.
Expiration:	Expiration date is one (1) year from date of receipt.

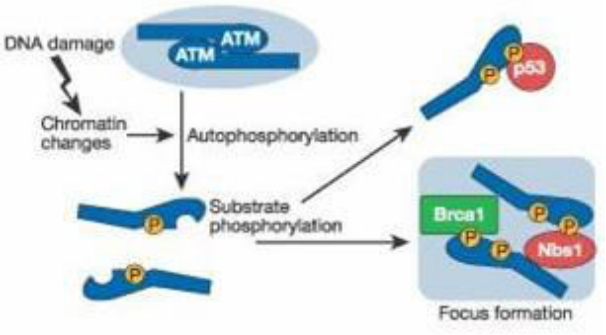
Images



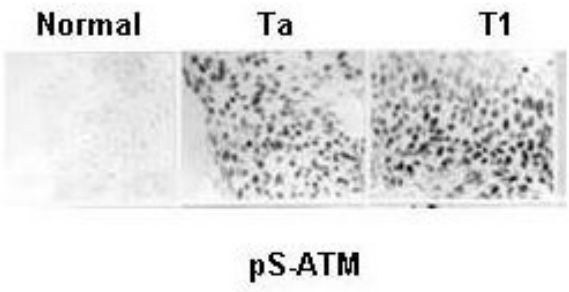
Western Blot
Determination of ATM and ATMp antibodies specificity by western blotting. Western blot analysis of neuroretinas and brains from adult Atm-deficient and adult C57BL/6J mice was performed with monoclonal antibodies raised against ATM and ATMp, and with polyclonal antibody β-actin (internal control). Specific bands for ATM (350 kDa), ATMp (350 kDa), and β-actin (35 kDa) were detected by western blot analysis of protein homogenates extracted from different mouse tissues (neuroretina and brain). No band could be detected in protein homogenates from Atm-deficient mice tissues blotted with either specific ATM or specific ATMp antibody. Figure provided by CiteAb. Source: Mol Vis, PMID: 19234633.



Immunohistochemistry
Representative images of colon-specific stages stained with ataxia telangiectasia-mutated pS1981, checkpoint kinase 2 pT68 and histone H2AX pS139 (γ-H2AX). Normal, low-grade dysplasia (LGD), high-grade dysplasia (HGD) and invasive carcinoma are shown. Note that no staining is displayed in normal crypts for any of the markers, a staining appear for each protein in LGD, an even more drastic staining in HGD and almost no more staining in invasive carcinoma. Magnification ×200 of the samples are shown.
Figure 2. PMID: 18641004



Pathway
ATM authophosphorylation.



Immunohistochemistry
Anti ATM monoclonal Antibody was used to show constitutive activation of the ATM pathway in human urinary bladder cancer. Anti-ATM Protein Kinase pS1981 (clone # 7C10D8) was used to stain normal uroepithelium, early superficial lesions (Ta), and earliest invasive (T1) primary carcinomas. ATM protein is ubiquitously expressed, but Ser 1981-phosphorylated ATM (pS-ATM) is detectable only in tumor tissues. See Bartkova et al. for additional details. Reprinted by permission from Nature (Cell Cycle 4;(6), 2005) Macmillan Publishers Ltd.

References

- Altshuller M et al. ATM promotes reversed fork processing during DNA interstrand cross-link repair. *bioRxiv [Preprint].* (2025)
- Jiang, Z et al. Hypophosphorylated pRb knock-in mice exhibit hallmarks of aging and vitamin C-preventable diabetes. *The Embo Journal* (2022)
- Sakai T et al. Effects of the Cytoplasm and Mitochondrial Specific Hydroxyl Radical Scavengers TA293 and mitoTA293 in Bleomycin-Induced Pulmonary Fibrosis Model Mice. *Antioxidants (Basel).* (2021)
- Bellusci G et al. Kinase-independent inhibition of cyclophosphamide-induced pathways protects the ovarian reserve and prolongs fertility. *Cell Death Dis.* (2021)
- Mattiello L et al. Asciminib Mitigates DNA Damage Stress Signaling Induced by Cyclophosphamide in the Ovary. *Int J Mol Sci.* (2021)
- Rosina et al. Osteogenic differentiation of skeletal muscle progenitor cells is activated by the DNA damage response. *Scientific Reports* (2019)
- Nagane M et al. Ataxia-telangiectasia mutated (ATM) kinase regulates eNOS expression and modulates radiosensitivity in endothelial cells exposed to ionizing radiation. *Radiat Res.* (2018)
- Kim MJ et al. PAF-Myc-controlled cell stemness is required for intestinal regeneration and tumorigenesis. *Dev Cell.* (2018)
- Emery et al. Expression and function of ABCG2 and XIAP in glioblastomas. *Journal of Neuro-Oncology* (2017)
- Sinha et al. A p53/ARF-dependent anticancer barrier activates senescence and blocks tumorigenesis without impacting apoptosis. *Molecular Cancer Research* (2015)
- Liu et al. Loss of autophagy causes a synthetic lethal deficiency in DNA repair. *Proc. Natl. Acad. Sci. U.S.A* (2015)
- Chene G et al. DNA damage signaling and apoptosis in preinvasive tubal lesions of ovarian carcinoma. *Int J Gynecol Cancer.* (2015)
- Nagane M et al. Activation of eNOS in endothelial cells exposed to ionizing radiation involves components of the DNA damage response pathway. *Biochem Biophys Res Commun.* (2015)
- Phesse TJ et al. Endogenous c-Myc is essential for p53-induced apoptosis in response to DNA damage in vivo. *Cell Death Differ.* (2014)
- Broering TJ et al. BRCA1 establishes DNA damage signaling and pericentric heterochromatin of the X chromosome in male meiosis. *J Cell Biol* (2014)
- Shamma A et al. ATM mediates pRB function to control DNMT1 protein stability and DNA methylation. *Mol Cell Biol* (2013)
- Vidal-Eychenié S, Décaillet C, Basbous J, Constantinou A. DNA structure-specific priming of ATR activation by DNA-PKcs. *J Cell Biol.* (2013)
- Schwab KR et al. Arrested spermatogenesis and evidence for DNA damage in PTIP mutant testes. *Dev Biol.* (2013)
- Parikh N et al. Mouse tissues that undergo neoplastic progression after K-Ras activation are distinguished by nuclear translocation of phospho-Erk1/2 and robust tumor suppressor responses. *Mol Cancer Res.* (2012)
- Lantuejoul S et al. Telomere maintenance and DNA damage responses during lung carcinogenesis. *Clin Cancer Res.* (2010)

- Raynaud CM et al. DNA damage repair and telomere length in normal breast, preneoplastic lesions, and invasive cancer. *Am J Clin Oncol.* (2010)
- Navaraj A et al. Reduced cell death, invasive and angiogenic features conferred by BRCA1-deficiency in mammary epithelial cells transformed with H-Ras. *Cancer Biol Ther.* (2009)
- Raynaud CM et al. Telomere length, telomeric proteins and DNA damage repair proteins are differentially expressed between primary lung tumors and their adrenal metastases. *Lung Cancer.* (2009)
- Leemput J et al. ATM localization and gene expression in the adult mouse eye. *Mol Vis.* (2009)
- Raynaud CM et al. Telomere shortening is correlated with the DNA damage response and telomeric protein down-regulation in colorectal preneoplastic lesions *Ann Oncol.* (2008)
- Bartkova J, Bakkenist CJ, Rajpert-De Meyts E, et al. ATM activation in normal human tissues and testicular cancer. *Cell Cycle* (2005)
- Kitagawa et al. Phosphorylation of SMC1 is a critical downstream event in the ATM-NBS1-BRCA1 pathway. *Genes Dev.* (2004)

Disclaimer