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ATR Polyclonal Antibody

Catalog # AP68599

Product Information

Application	WB, IHC-P, IF, ICC, E
Primary Accession	Q13535
Reactivity	Human, Rat, Mouse
Host	Rabbit
Clonality	Polyclonal
Calculated MW	301367

Additional Information

Gene ID	545
Other Names	ATR; FRP1; Serine/threonine-protein kinase ATR; Ataxia telangiectasia and Rad3-related protein; FRAP-related protein 1
Dilution	WB~~Western Blot: 1/500 - 1/2000. Immunohistochemistry: 1/100 - 1/300. ELISA: 1/40000. Not yet tested in other applications. IHC-P~~N/A IF~~1:50~200 ICC~~N/A E~~N/A
Format	Liquid in PBS containing 50% glycerol, 0.5% BSA and 0.09% (W/V) sodium azide.
Storage Conditions	-20℃

Protein Information

Name	ATR {ECO:0000303|PubMed:14729973, ECO:0000312|HGNC:HGNC:882}
Function	Serine/threonine protein kinase which activates checkpoint signaling upon genotoxic stresses such as ionizing radiation (IR), ultraviolet light (UV), or DNA replication stalling, thereby acting as a DNA damage sensor (PubMed:10597277, PubMed:10608806, PubMed:10859164, PubMed:11721054, PubMed:12791985, PubMed:12814551, PubMed:14657349, PubMed:14729973, PubMed:14742437, PubMed:15210935, PubMed:15496423, PubMed:16260606, PubMed:21144835, PubMed:21777809, PubMed:23273981, PubMed:25083873, PubMed:27723717, PubMed:27723720, PubMed:30139873, PubMed:33848395, PubMed:37788673, PubMed:37832547, PubMed:9427750, PubMed:9636169). Recognizes the substrate consensus sequence [ST]-Q (PubMed:10597277, PubMed:10608806, PubMed:10859164, PubMed:11721054, PubMed:12791985, PubMed:12814551, PubMed:14657349, PubMed:14729973, PubMed:14742437, PubMed:15210935, PubMed:15496423, PubMed:16260606, PubMed:21144835, PubMed:23273981,

PubMed:27723717, PubMed:27723720, PubMed:33848395, PubMed:9427750, PubMed:9636169). Phosphorylates BRCA1, CHEK1, MCM2, RAD17, RBBP8, RPA2, SMC1 and p53/TP53, which collectively inhibit DNA replication and mitosis and promote DNA repair, recombination and apoptosis (PubMed:11114888, PubMed:11418864, PubMed:11865061, PubMed:21777809, PubMed:23273981, PubMed:25083873, PubMed:9925639). Phosphorylates 'Ser-139' of histone variant H2AX at sites of DNA damage, thereby regulating DNA damage response mechanism (PubMed:11673449). Required for FANCD2 ubiquitination (PubMed:15314022). Critical for maintenance of fragile site stability and efficient regulation of centrosome duplication (PubMed:12526805). Acts as a regulator of the S-G2 transition by restricting the activity of CDK1 during S-phase to prevent premature entry into G2 (PubMed:30139873). Acts as a regulator of the nuclear envelope integrity in response to DNA damage and stress (PubMed:25083873, PubMed:37788673, PubMed:37832547). Acts as a mechanical stress sensor at the nuclear envelope: relocalizes to the nuclear envelope in response to mechanical stress and mediates a checkpoint via phosphorylation of CHEK1 (PubMed:25083873). Also promotes nuclear envelope rupture in response to DNA damage by mediating phosphorylation of LMNA at 'Ser-282', leading to lamin disassembly (PubMed:37832547). Involved in the inflammatory response to genome instability and double-stranded DNA breaks: acts by localizing to micronuclei arising from genome instability and catalyzing phosphorylation of LMNA at 'Ser-395', priming LMNA for subsequent phosphorylation by CDK1 and micronuclei envelope rupture (PubMed:37788673). The rupture of micronuclear envelope triggers the cGAS-STING pathway thereby activating the type I interferon response and innate immunity (PubMed:37788673). Positively regulates the restart of stalled replication forks following activation by the KHDC3L-OOEP scaffold complex (By similarity).

Cellular Location

Nucleus. Chromosome. Nucleus envelope. Note=Depending on the cell type, it can also be found in PML nuclear bodies (PubMed:12814551). Recruited to chromatin during S-phase (PubMed:14871897). Redistributes to discrete nuclear foci upon DNA damage, hypoxia or replication fork stalling (PubMed:27723720). Relocalizes to the nuclear envelope in response to mechanical stress or DNA damage (PubMed:25083873, PubMed:37832547) Also localizes to the micronuclear envelope in response to response to genome instability (PubMed:37788673).

Tissue Location

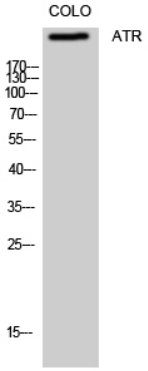
Ubiquitous, with highest expression in testis.

Background

Serine/threonine protein kinase which activates checkpoint signaling upon genotoxic stresses such as ionizing radiation (IR), ultraviolet light (UV), or DNA replication stalling, thereby acting as a DNA damage sensor. Recognizes the substrate consensus sequence [ST]-Q. Phosphorylates BRCA1, CHEK1, MCM2, RAD17, RPA2, SMC1 and p53/TP53, which collectively inhibit DNA replication and mitosis and promote DNA repair, recombination and apoptosis. Phosphorylates 'Ser-139' of histone variant H2AX/H2AFX at sites of DNA damage, thereby regulating DNA damage response mechanism. Required for FANCD2 ubiquitination. Critical for maintenance of fragile site stability and efficient regulation of centrosome duplication.

Images

Western Blot analysis of COLO cells using ATR Polyclonal Antibody cells nucleus extracted by Minute TM Cytoplasmic and Nuclear Fractionation kit (SC-003,Inventbiotech,MN,USA).



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