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DNA-PKcs Antibody

Purified Mouse Monoclonal Antibody (Mab)
Catalog # AP52745

Product Information

Application	WB, ICC, IP
Primary Accession	P78527
Reactivity	Human
Host	Mouse
Clonality	Monoclonal
Isotype	lgG2b
Calculated MW	469089

Additional Information

Gene ID	5591
Other Names	DNA dependent protein kinase catalytic subuni;DNA PKcs;DNA-dependent protein kinase catalytic subunit;DNA-PK catalytic subunit;DNAPK;DNPK1;hyper radiosensitivity of murine scid mutation, complementing 1;HYRC;HYRC1;p350;p460;PRKDC;PRKDC_HUMAN;protein kinase, DNA activated, catalytic polypeptide;XRCC7.
Dilution	WB~~1:1000 ICC~~1:200 IP~~1:500
Format	Liquid in PBS containing 50% glycerol, 0.5% BSA and 0.02% sodium azide, pH 7.3.
Storage	Store at 4°C short term. Aliquot and store at -20°C long term. Avoid freeze/thaw cycles.

Protein Information

Name	PRKDC
Synonyms	HYRC, HYRC1
Function	Serine/threonine-protein kinase that acts as a molecular sensor for DNA damage (PubMed:11955432, PubMed:12649176, PubMed:14734805, PubMed:33854234). Involved in DNA non-homologous end joining (NHEJ) required for double-strand break (DSB) repair and V(D)J recombination (PubMed:11955432, PubMed:12649176, PubMed:14734805, PubMed:33854234, PubMed:34352203). Must be bound to DNA to express its catalytic properties (PubMed:11955432). Promotes processing of hairpin DNA structures in V(D)J recombination by activation of the hairpin endonuclease artemis (DCLRE1C) (PubMed:11955432). Recruited by XRCC5 and XRCC6 to DNA ends and is required to (1) protect and align broken ends of DNA,

thereby preventing their degradation, (2) and sequester the DSB for repair by NHEJ (PubMed:11955432, PubMed:12649176, PubMed:14734805, PubMed:15574326, PubMed:33854234). Acts as a scaffold protein to aid the localization of DNA repair proteins to the site of damage (PubMed:11955432, PubMed:12649176, PubMed:14734805, PubMed:15574326). The assembly of the DNA-PK complex at DNA ends is also required for the NHEJ ligation step (PubMed:11955432, PubMed:12649176, PubMed:14734805, PubMed:15574326). Found at the ends of chromosomes, suggesting a further role in the maintenance of telomeric stability and the prevention of chromosomal end fusion (By similarity). Also involved in modulation of transcription (PubMed:11955432, PubMed:12649176, PubMed:14734805, PubMed:15574326). As part of the DNA-PK complex, involved in the early steps of ribosome assembly by promoting the processing of precursor rRNA into mature 18S rRNA in the small-subunit processome (PubMed:32103174). Binding to U3 small nucleolar RNA, recruits PRKDC and XRCC5/Ku86 to the small-subunit processome (PubMed:32103174). Recognizes the substrate consensus sequence [ST]-Q (PubMed:11955432, PubMed:12649176, PubMed:14734805, PubMed:15574326). Phosphorylates 'Ser-139' of histone variant H2AX, thereby regulating DNA damage response mechanism (PubMed:14627815, PubMed:16046194). Phosphorylates ASF1A, DCLRE1C, c-Abl/ABL1, histone H1, HSPCA, c-jun/JUN, p53/TP53, PARP1, POU2F1, DHX9, FH, SRF, NHEJ1/XLF, XRCC1, XRCC4, XRCC5, XRCC6, WRN, MYC and RFA2 (PubMed:10026262, PubMed:10467406, PubMed:11889123, PubMed:12509254, PubMed:14599745, PubMed:14612514, PubMed:14704337, PubMed:15177042, PubMed:1597196, PubMed:16397295, PubMed:18644470, PubMed:2247066, PubMed:2507541, PubMed:26237645, PubMed:26666690, PubMed:28712728, PubMed:29478807, PubMed:30247612, PubMed:8407951, PubMed:8464713, PubMed:9139719, PubMed:9362500). Can phosphorylate C1D not only in the presence of linear DNA but also in the presence of supercoiled DNA (PubMed:9679063). Ability to phosphorylate p53/TP53 in the presence of supercoiled DNA is dependent on C1D (PubMed:9363941). Acts as a regulator of the phosphatidylinositol 3-kinase/protein kinase B signal transduction by mediating phosphorylation of 'Ser-473' of protein kinase B (PKB/AKT1, PKB/AKT2, PKB/AKT3), promoting their activation (PubMed:15262962). Contributes to the determination of the circadian period length by antagonizing phosphorylation of CRY1 'Ser-588' and increasing CRY1 protein stability, most likely through an indirect mechanism (By similarity). Plays a role in the regulation of DNA virus-mediated innate immune response by assembling into the HDP-RNP complex, a complex that serves as a platform for IRF3 phosphorylation and subsequent innate immune response activation through the cGAS-STING pathway (PubMed:28712728). Also regulates the cGAS-STING pathway by catalyzing phosphorylation of CGAS, thereby impairing CGAS oligomerization and activation (PubMed:33273464). Also regulates the cGAS-STING pathway by mediating phosphorylation of PARP1 (PubMed:35460603).

Cellular Location Nucleus. Nucleus, nucleolus. Cytoplasm, cytosol

Background

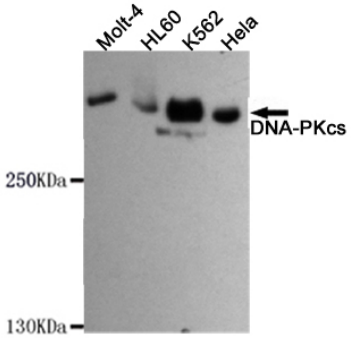
Serine/threonine-protein kinase that acts as a molecular sensor for DNA damage. Involved in DNA non-homologous end joining (NHEJ) required for double-strand break (DSB) repair and V(D)J recombination. Must be bound to DNA to express its catalytic properties. Promotes processing of hairpin DNA structures in V(D)J recombination by activation of the hairpin endonuclease artemis (DCLRE1C). The assembly of the DNA-PK complex at DNA ends is also required for the NHEJ ligation step. Required to protect and align broken ends of DNA. May also act as a scaffold protein to aid the localization of DNA repair proteins to the site of damage. Found at the ends of chromosomes, suggesting a further role in the maintenance of telomeric stability and the prevention of chromosomal end fusion. Also involved in modulation of transcription. Recognizes the substrate consensus sequence [ST]-Q. Phosphorylates 'Ser-139' of histone

variant H2AX/H2AFX, thereby regulating DNA damage response mechanism. Phosphorylates DCLRE1C, c-Abl/ABL1, histone H1, HSPCA, c-jun/JUN, p53/TP53, PARP1, POU2F1, DHX9, SRF, XRCC1, XRCC1, XRCC4, XRCC5, XRCC6, WRN, MYC and RFA2. Can phosphorylate C1D not only in the presence of linear DNA but also in the presence of supercoiled DNA. Ability to phosphorylate p53/TP53 in the presence of supercoiled DNA is dependent on C1D. Contributes to the determination of the circadian period length by antagonizing phosphorylation of CRY1 'Ser-588' and increasing CRY1 protein stability, most likely through an indirect machanism. Interacts with CRY1 and CRY2; negatively regulates CRY1 phosphorylation.

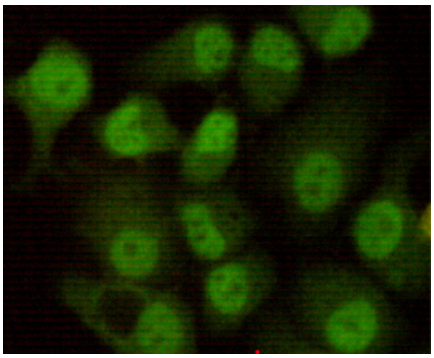
References

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Sipley J.D.,et al.Proc. Natl. Acad. Sci. U.S.A. 92:7515-7519(1995).

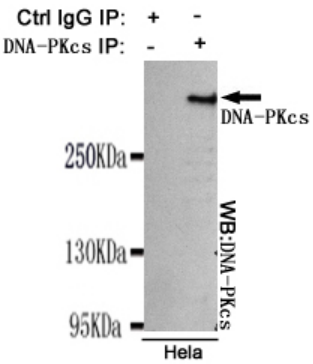
Images



Western blot detection of DNA-PKcs in Hela,K562,HL-60 and MOLT-4 cell lysates using DNA-PKcs mouse mAb (1:1000 diluted).Predicted band size:450KDa,Observed band size:450KDa.



Immunocytochemistry stain of Hela using DNA-PKcs mouse mAb (1:200).



Immunoprecipitation analysis of Hela cell lysates using DNA-PKcs mouse mAb.

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.