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MDC1 Rabbit pAb

Catalog # AP96482

Product Information

Application	WB, IHC-P, IHC-F, IF
Primary Accession	Q14676
Other Accession	Q14676
Reactivity	Rat, Mouse
Predicted	Pig, Human, Dog, Horse
Host	Rabbit
Clonality	Polyclonal
Calculated MW	226666
Physical State	Liquid
Immunogen	KLH conjugated synthetic peptide derived from human NFBD1
Epitope Specificity	31-130/2089
Isotype	IgG
Purity	affinity purified by Protein A
Buffer	0.01M TBS (pH7.4) with 1% BSA, 0.02% Proclin300 and 50% Glycerol.
SIMILARITY	Contains 2 BRCT domains.Contains 1 FHA domain.
SUBUNIT	Interacts with several proteins involved in the DNA damage response, although not all these interactions may be direct. Interacts with H2AFX, which requires phosphorylation of H2AFX on 'Ser-139'. Interacts with the MRN complex, composed of MRE11A/MRE11, RAD50, and NBN. Interacts with CHEK2, which requires ATM-mediated phosphorylation of 'Thr-68' within the FHA domain of CHEK2. Interacts constitutively with the BRCA1-BARD1 complex, SMC1A and TP53BP1. Interacts with ATM and FANCD2, and these interactions are reduced upon DNA damage. Also interacts with the PRKDC complex, composed of XRCC6/KU70, XRCC5/KU80 and PRKDC/XRCC7. This interaction may be required for PRKDC autophosphorylation, which is essential for DNA double strand break (DSB) repair. When phosphorylated by ATM, interacts with RNF8 (via FHA domain). Interacts with CEP164. When phosphorylated, interacts with APTX (via FHA-like domain).
Post-translational modifications	Phosphorylated upon exposure to ionizing radiation (IR), ultraviolet radiation (UV), and hydroxyurea (HU). Phosphorylation in response to IR requires ATM, NBN, and possibly CHEK2. Also phosphorylated during the G2/M phase of the cell cycle and during activation of the mitotic spindle checkpoint.
Important Note	This product as supplied is intended for research use only, not for use in human, therapeutic or diagnostic applications.
Background Descriptions	The protein encoded by this gene contains an N-terminal forkhead domain, two BRCA1 C-terminal (BRCT) motifs and a central domain with 13 repetitions of an approximately 41-amino acid sequence. The encoded protein is required to activate the intra-S phase and G2/M phase cell cycle checkpoints in response to DNA damage. This nuclear protein interacts with phosphorylated histone H2AX near sites of DNA double-strand breaks through its BRCT motifs, and facilitates recruitment of the ATM kinase and meiotic recombination 11 protein complex to DNA damage foci. [provided by RefSeq].

Additional Information

Gene ID	9656
Other Names	NFBD1; 6820401C03; mKIAA0170; MDC1_HUMAN; MDC1; Nuclear factor with BRCT domains 1; KIAA0170; MDC1_MOUSE; mediator of DNA damage checkpoint 1; mediator of DNA-damage checkpoint 1
Dilution	WB=1:500-2000,IHC-P=1:100-500,IHC-F=1:100-500,IF=1:100-500
Storage	Store at -20 °C for one year. Avoid repeated freeze/thaw cycles. When reconstituted in sterile pH 7.4 0.01M PBS or diluent of antibody the antibody is stable for at least two weeks at 2-4 °C.

Protein Information

Name	MDC1 {ECO:0000303|PubMed:14695167, ECO:0000312|HGNC:HGNC:21163}
Function	Histone reader protein required for checkpoint-mediated cell cycle arrest in response to DNA damage within both the S phase and G2/M phases of the cell cycle (PubMed:12475977, PubMed:12499369, PubMed:12551934, PubMed:12607003, PubMed:12607004, PubMed:12607005, PubMed:12611903, PubMed:14695167, PubMed:15201865, PubMed:15377652, PubMed:16049003, PubMed:16377563, PubMed:30898438). Specifically recognizes and binds histone H2AX phosphorylated at 'Ser-139', a marker of DNA damage, serving as a scaffold for the recruitment of DNA repair and signal transduction proteins to discrete foci of DNA damage sites (PubMed:12607005, PubMed:15201865, PubMed:16049003, PubMed:16377563, PubMed:30898438). Also required for downstream events subsequent to the recruitment of these proteins (PubMed:12607005, PubMed:15201865, PubMed:16049003, PubMed:16377563, PubMed:18582474). These include phosphorylation and activation of the ATM, CHEK1 and CHEK2 kinases, and stabilization of TP53/p53 and apoptosis (PubMed:12499369, PubMed:12551934, PubMed:12607004). ATM and CHEK2 may also be activated independently by a parallel pathway mediated by TP53BP1 (PubMed:12499369, PubMed:12551934, PubMed:12607004). Required for chromosomal stability during mitosis by promoting recruitment of TOPBP1 to DNA double strand breaks (DSBs): TOPBP1 forms filamentous assemblies that bridge MDC1 and tether broken chromosomes during mitosis (PubMed:30898438). Required for the repair of DSBs via homologous recombination by promoting recruitment of NBN component of the MRN complex to DSBs (PubMed:18411307, PubMed:18582474, PubMed:18583988, PubMed:18678890).
Cellular Location	Nucleus. Chromosome Note=Associated with chromatin (PubMed:12607005, PubMed:15201865, PubMed:16049003, PubMed:16377563). Relocalizes to discrete nuclear foci following DNA damage, this requires 'Ser-139' phosphorylation of H2AX (PubMed:12607005, PubMed:15201865, PubMed:16049003, PubMed:16377563, PubMed:30898438, PubMed:35842428). Colocalizes with APTX at sites of DNA double-strand breaks (PubMed:20008512)
Tissue Location	Highly expressed in testis.

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