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CHEK2 Mouse mAb

Catalog # AP96502

Product Information

Application	WB
Reactivity	Human
Host	Mouse
Clonality	Monoclonal
Calculated MW	56 KDa
Physical State	Liquid
Isotype	IgG2B/lambda
Purity	affinity purified by Protein G
Buffer	0.01M TBS (pH7.4) with 1% BSA, 0.02% Proclin300 and 50% Glycerol.
SIMILARITY	Belongs to the protein kinase superfamily. CAMK Ser/Thr protein kinase family. CHK2 subfamily.Contains 1 FHA domain.Contains 1 protein kinase domain.
SUBUNIT	Homodimer. Homodimerization is part of the activation process but the dimer may dissociate following activation. Interacts with PML. Interacts with TP53. Interacts with RB1; phosphorylates RB1. Interacts with BRCA1. Interacts (phosphorylated at Thr-68) with MDC1; requires ATM-mediated phosphorylation of CHEK2. Interacts with TP53BP1; modulates CHEK2 phosphorylation at Thr-68 in response to ionizing radiation. Interacts with CDC25A; phosphorylates CDC25A and mediates its degradation in response to ionizing radiation. Interacts with CUL1; mediates CHEK2 ubiquitination and regulation.
Post-translational modifications	Phosphorylated. Phosphorylated at Ser-73 by PLK3 in response to DNA damage, promoting phosphorylation at Thr-68 by ATM and the G2/M transition checkpoint. Phosphorylation at Thr-68 induces homodimerization. Autophosphorylates at Thr-383 and Thr-387 in the T-loop/activation segment upon dimerization to become fully active and phosphorylate its substrates like for instance CDC25C. DNA damage-induced autophosphorylation at Ser-379 induces CUL1-mediated ubiquitination and regulates the pro-apoptotic function. Phosphorylation at Ser-456 also regulates ubiquitination. Phosphorylated by PLK4.Ubiquitinated. CUL1-mediated ubiquitination regulates the pro-apoptotic function. Ubiquitination may also regulate protein stability (PubMed:17715138).
DISEASE	Defects in CHEK2 are associated with Li-Fraumeni syndrome 2 (LFS2) [MIM:609265]; a highly penetrant familial cancer phenotype usually associated with inherited mutations in p53/TP53.Defects in CHEK2 may be a cause of susceptibility to prostate cancer (PC) [MIM:176807]. It is a malignancy originating in tissues of the prostate. Most prostate cancers are adenocarcinomas that develop in the acini of the prostatic ducts. Other rare histopathologic types of prostate cancer that occur in approximately 5% of patients include small cell carcinoma, mucinous carcinoma, prostatic ductal carcinoma, transitional cell carcinoma, squamous cell carcinoma, basal cell carcinoma, adenoid cystic carcinoma (basaloid), signet-ring cell carcinoma and neuroendocrine carcinoma.Defects in CHEK2 are found in some patients with osteogenic sarcoma (OSRC) [MIM:259500].Defects in CHEK2 is a cause of susceptibility to breast cancer (BC) [MIM:114480]. A common malignancy

	originating from breast epithelial tissue. Breast neoplasms can be distinguished by their histologic pattern. Invasive ductal carcinoma is by far the most common type. Breast cancer is etiologically and genetically heterogeneous. Important genetic factors have been indicated by familial occurrence and bilateral involvement. Mutations at more than one locus can be involved in different families or even in the same case. Note=CHEK2 variants are associated with susceptibility to breast cancer and contribute to a substantial fraction of familial breast cancer (PubMed:12094328).
Important Note	This product as supplied is intended for research use only, not for use in human, therapeutic or diagnostic applications.
Background Descriptions	In response to DNA damage and replication blocks, cell cycle progression is halted through the control of critical cell cycle regulators. The protein encoded by this gene is a cell cycle checkpoint regulator and putative tumor suppressor. It contains a forkhead-associated protein interaction domain essential for activation in response to DNA damage and is rapidly phosphorylated in response to replication blocks and DNA damage. When activated, the encoded protein is known to inhibit CDC25C phosphatase, preventing entry into mitosis, and has been shown to stabilize the tumor suppressor protein p53, leading to cell cycle arrest in G1. In addition, this protein interacts with and phosphorylates BRCA1, allowing BRCA1 to restore survival after DNA damage. Mutations in this gene have been linked with Li-Fraumeni syndrome, a highly penetrant familial cancer phenotype usually associated with inherited mutations in TP53. Also, mutations in this gene are thought to confer a predisposition to sarcomas, breast cancer, and brain tumors. This nuclear protein is a member of the CDS1 subfamily of serine/threonine protein kinases. Several transcript variants encoding different isoforms have been found for this gene. [provided by RefSeq, Apr 2012]

Additional Information

Other Names	CDS1; CHK2; HuCds1; LFS2; PP1425; RAD53; TPDS4; hCds1; CHK2_HUMAN; CHEK2; CHK2 checkpoint homolog; Cds1 homolog (Hucds1 | hCds1); Checkpoint kinase 2; 2.7.11.1; CHK2_MOUSE; Q9R019_RAT; CHK2 (checkpoint, S.pombe) homolog; CHK2 checkpoint homolog (S. pombe)
Dilution	WB=1:500-2000
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.
Name	CHEK2 Mouse mAb
Function	Serine/threonine-protein kinase which is required for checkpoint-mediated cell cycle arrest, activation of DNA repair and apoptosis in response to the presence of DNA double-strand breaks. May also negatively regulate cell cycle progression during unperturbed cell cycles. Following activation, phosphorylates numerous effectors preferentially at the consensus sequence [L-X-R-X-X-S/T]. Regulates cell cycle checkpoint arrest through phosphorylation of CDC25A, CDC25B and CDC25C, inhibiting their activity. Inhibition of CDC25 phosphatase activity leads to increased inhibitory tyrosine phosphorylation of CDK-cyclin complexes and blocks cell cycle progression. May also phosphorylate NEK6 which is involved in G2/M cell cycle arrest. Regulates DNA repair through phosphorylation of BRCA2, enhancing the association of RAD51 with chromatin which promotes DNA repair by homologous recombination. Also stimulates the transcription of genes involved in DNA repair (including BRCA2) through the phosphorylation and activation of the

transcription factor FOXM1. Regulates apoptosis through the phosphorylation of p53/TP53, MDM4 and PML. Phosphorylation of p53/TP53 at 'Ser-20' by CHEK2 may alleviate inhibition by MDM2, leading to accumulation of active p53/TP53. Phosphorylation of MDM4 may also reduce degradation of p53/TP53. Also controls the transcription of pro-apoptotic genes through phosphorylation of the transcription factor E2F1. Tumor suppressor, it may also have a DNA damage-independent function in mitotic spindle assembly by phosphorylating BRCA1. Its absence may be a cause of the chromosomal instability observed in some cancer cells.

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