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CHK1 Blocking Peptide (Center)

Synthetic peptide

Catalog # BP7401c

Specification

CHK1 Blocking Peptide (Center) - Product Information

Primary Accession O14757

CHK1 Blocking Peptide (Center) - Additional Information

Gene ID 1111

Other Names
Serine/threonine-protein kinase Chk1, CHK1 checkpoint homolog, Cell cycle checkpoint kinase, Checkpoint kinase-1, CHEK1, CHK1

Target/Specificity
The synthetic peptide sequence is selected from aa 310-324 of HUMAN CHEK1

Format
Peptides are lyophilized in a solid powder format. Peptides can be reconstituted in solution using the appropriate buffer as needed.

Storage
Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C.

Precautions
This product is for research use only. Not for use in diagnostic or therapeutic procedures.

CHK1 Blocking Peptide (Center) - Protein Information

Name CHEK1

Synonyms CHK1

Function
Serine/threonine-protein kinase which is required for checkpoint-mediated cell cycle arrest and activation of DNA repair in

CHK1 Blocking Peptide (Center) - Background

Required for checkpoint mediated cell cycle arrest in response to DNA damage or the presence of unreplicated DNA. May also negatively regulate cell cycle progression during unperturbed cell cycles. Recognizes the substrate consensus sequence [R-X-X-S/T]. Binds to and phosphorylates CDC25A, CDC25B and CDC25C. Phosphorylation of CDC25A at 'Ser-178' and 'Thr-507' and phosphorylation of CDC25C at 'Ser-216' creates binding sites for 14-3-3 proteins which inhibit CDC25A and CDC25C. Phosphorylation of CDC25A at 'Ser-76', 'Ser-124', 'Ser-178', 'Ser-279' and 'Ser-293' promotes proteolysis of CDC25A. Inhibition of CDC25 activity leads to increased inhibitory tyrosine phosphorylation of CDK-cyclin complexes and blocks cell cycle progression. Binds to and phosphorylates RAD51 at 'Thr-309', which may enhance the association of RAD51 with chromatin and promote DNA repair by homologous recombination. Binds to and phosphorylates TLK1 at 'Ser-743', which prevents the TLK1-dependent phosphorylation of the chromatin assembly factor ASF1A. This may affect chromatin assembly during S phase or DNA repair. May also phosphorylate multiple sites within the C-terminus of TP53, which promotes activation of TP53 by acetylation and enhances suppression of cellular proliferation.

CHK1 Blocking Peptide (Center) - References

Kramer, A., et al., Nat. Cell Biol. 6(9):884-891 (2004).
Xu, X., et al., J. Biol. Chem. 279(33):34091-34094 (2004).
Ng, C.P., et al., J. Biol. Chem. 279(10):8808-8819 (2004).
Chen, M.S., et al., Mol. Cell. Biol. 23(21):7488-7497 (2003).
Groth, A., et al., EMBO J. 22(7):1676-1687 (2003).

response to the presence of DNA damage or unreplicated DNA (PubMed:11535615, PubMed:12446774, PubMed:12399544, PubMed:14559997, PubMed:14988723, PubMed:15311285, PubMed:15665856, PubMed:15650047). May also negatively regulate cell cycle progression during unperturbed cell cycles (PubMed:11535615, PubMed:12446774, PubMed:12399544, PubMed:14559997, PubMed:14988723, PubMed:15311285, PubMed:15665856, PubMed:15650047). This regulation is achieved by a number of mechanisms that together help to preserve the integrity of the genome (PubMed:11535615, PubMed:<a href="http://www.uniprot.org/citations/12446774"

target="_blank">12446774,
PubMed:<a href="http://www.uniprot.org/citations/12399544"
target="_blank">12399544,
PubMed:<a href="http://www.uniprot.org/citations/14559997"
target="_blank">14559997,
PubMed:<a href="http://www.uniprot.org/citations/14988723"
target="_blank">14988723,
PubMed:<a href="http://www.uniprot.org/citations/15311285"
target="_blank">15311285,
PubMed:<a href="http://www.uniprot.org/citations/15665856"
target="_blank">15665856,
PubMed:<a href="http://www.uniprot.org/citations/15650047"
target="_blank">15650047).
Recognizes the substrate consensus sequence [R-X-X-S/T] (PubMed:<a href="http://www.uniprot.org/citations/11535615"
target="_blank">11535615,
PubMed:<a href="http://www.uniprot.org/citations/12446774"
target="_blank">12446774,
PubMed:<a href="http://www.uniprot.org/citations/12399544"
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target="_blank">15311285,
PubMed:<a href="http://www.uniprot.org/citations/15665856"
target="_blank">15665856,
PubMed:<a href="http://www.uniprot.org/citations/15650047"
target="_blank">15650047). Binds to and phosphorylates CDC25A, CDC25B and CDC25C (PubMed:<a href="http://www.uniprot.org/citations/9278511"
target="_blank">9278511,
PubMed:<a href="http://www.uniprot.org/citations/12676583"
target="_blank">12676583,
PubMed:<a href="http://www.uniprot.org/citations/14681206"
target="_blank">14681206,
PubMed:<a href="http://www.uniprot.org/citations/12676925"
target="_blank">12676925,

PubMed:12759351, PubMed:19734889, PubMed:14559997). Phosphorylation of CDC25A at 'Ser- 178' and 'Thr-507' and phosphorylation of CDC25C at 'Ser-216' creates binding sites for 14-3-3 proteins which inhibit CDC25A and CDC25C (PubMed:9278511). Phosphorylation of CDC25A at 'Ser-76', 'Ser-124', 'Ser-178', 'Ser-279' and 'Ser-293' promotes proteolysis of CDC25A (PubMed:9278511, PubMed:12676583, PubMed:14681206, PubMed:12676925, PubMed:12759351, PubMed:19734889). Phosphorylation of CDC25A at 'Ser- 76' primes the protein for subsequent phosphorylation at 'Ser-79', 'Ser-82' and 'Ser-88' by NEK11, which is required for polyubiquitination and degradation of CDCD25A (PubMed:9278511, PubMed:19734889, PubMed:20090422). Inhibition of CDC25 leads to increased inhibitory tyrosine phosphorylation of CDK-cyclin complexes and blocks cell cycle progression (PubMed:9278511). Also

phosphorylates NEK6 (PubMed:18728393). Binds to and phosphorylates RAD51 at 'Thr-309', which promotes the release of RAD51 from BRCA2 and enhances the association of RAD51 with chromatin, thereby promoting DNA repair by homologous recombination (PubMed:15665856). Phosphorylates multiple sites within the C-terminus of TP53, which promotes activation of TP53 by acetylation and promotes cell cycle arrest and suppression of cellular proliferation (PubMed:10673501, PubMed:15659650, PubMed:16511572). Also promotes repair of DNA cross-links through phosphorylation of FANCE (PubMed:17296736). Binds to and phosphorylates TLK1 at 'Ser-743', which prevents the TLK1-dependent phosphorylation of the chromatin assembly factor ASF1A (PubMed:12660173, PubMed:12955071). This may enhance chromatin assembly both in the presence or absence of DNA damage (PubMed:12660173, PubMed:12955071). May also play a role in replication fork maintenance through regulation of PCNA (PubMed:18451105). May regulate the transcription of genes that regulate cell-cycle progression through the phosphorylation of histones (By similarity). Phosphorylates histone H3.1 (to form H3T11ph), which leads to epigenetic inhibition of a subset of genes (By similarity). May also phosphorylate RB1 to promote its interaction with the E2F family

of transcription factors and subsequent cell cycle arrest (PubMed:17380128). Phosphorylates SPRTN, promoting SPRTN recruitment to chromatin (PubMed:31316063). Reduces replication stress and activates the G2/M checkpoint, by phosphorylating and inactivating PABIR1/FAM122A and promoting the serine/threonine-protein phosphatase 2A-mediated dephosphorylation and stabilization of WEE1 levels and activity (PubMed:33108758).

Cellular Location
Nucleus. Chromosome. Cytoplasm Cytoplasm, cytoskeleton, microtubule organizing center, centrosome. Note=Nuclear export is mediated at least in part by XPO1/CRM1 (PubMed:12676962). Also localizes to the centrosome specifically during interphase, where it may protect centrosomal CDC2 kinase from inappropriate activation by cytoplasmic CDC25B (PubMed:15311285). Proteolytic cleavage at the C-terminus by SPRTN promotes removal from chromatin (PubMed:31316063)

Tissue Location
Expressed ubiquitously with the most abundant expression in thymus, testis, small intestine and colon

CHK1 Blocking Peptide (Center) - Protocols

Provided below are standard protocols that you may find useful for product applications.

- Blocking Peptides