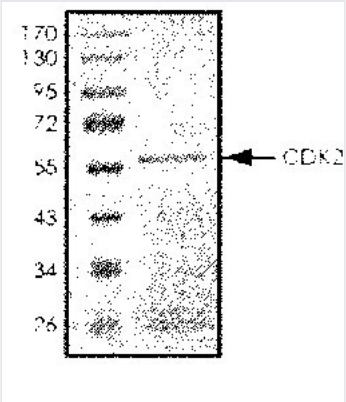
CDK2 Recombinant Protein

PRODUCT OVERVIEW

Product Name	CDK2, Recombinant Protein
Full Product Name	CDK2 recombinant protein
Product Gene Name	CDK2 recombinant protein
Product Synonym Gene Name	p33 (CDK2)
Product Synonym Names	p33 (CDK2)
Host	Sf9 insect cells
Form/Format	50mM Tris-HCl, pH 7.5, 50mM NaCl, 10mM glutathione, 0.1mM EDTA, 0.25mM DTT, 0.1mM PMSF, 25% glycerol.
Purity/Purification	>80%
Concentration	0.05ug/ul (lot specific)
Preparation and Storage	Store product at -70 degree C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles. Shipping: DRY ICE
Molecular Weight	~58 kDa
Chromosome Location	Chromosome: 12; NC_000012.11 (56360556..56366573). Location: 12q13
OMIM	116953
3D Structure	ModBase 3D Structure for P24941
Dry Ice Shipment	Extra charge fee may add to your shipping cost as dry ice is required to ship this product.
Product Categories/Family for CDK2 recombinant protein	Cell Cycle Proteins; Signaling Proteins - Cell Cycle Proteins
Related Product Information for CDK2 recombinant protein	Recombinant full-length human CDK2 was expressed by baculovirus in Sf9 insect cells using an N-terminal GST tag. **Scientific Background:** CDK2 is a member of the Cyclin-Dependent Kinase family that is ubiquitously expressed. CDK2 is a catalytic subunit of the cyclin-dependent protein kinase complex, whose activity is restricted to the G1-S phase, and essential for cell cycle G1/S phase transition. CDK2 associates with and is regulated by the regulatory subunits of the complex including Cyclin A or E, CDK inhibitor p21Cip1 (CDKN1A) and p27Kip1 (CDKN1B) (1). CDK2 phosphorylates multiple cellular substrates including SMAD3 and FOXO1. Phosphorylation of FOXO1 leads to its inhibition (2).
Product References and Citations for CDK2 recombinant protein	1. Levkau, B. et al: Cleavage of p21 (Cip1/Waf1) and p27 (Kip1) mediates apoptosis in endothelial cells through activation of Cdk2: role of a caspase cascade. Molec. Cell 1: 553-563, 1998. 2. Huang, H. et al: CDK2-dependent phosphorylation of FOXO1 as an apoptotic response to DNA damage. Science 314: 294-297, 2006.
Other Notes	Small volumes of CDK2 recombinant protein vial(s) may occasionally become entrapped in the seal of the product vial during shipment and storage. If necessary, briefly centrifuge the vial on a tabletop centrifuge to dislodge any liquid in the container`s cap. Certain products may require to ship with dry ice and additional dry ice fee may apply.
Searchable Terms for CDK2 purchase	MBS515383 is a recombinant protein targeting CDK2. Host: Sf9 insect cells.



SDS-PAGE of CDK2 recombinant protein
The purity was determined to be >80% by densitometry. Approx. MW 58kDa

ADDITIONAL DETAILS

NCBI/Uniprot data below describe general gene information for CDK2. It may not necessarily be applicable to this product.

NCBI GI #	166362720
NCBI GeneID	1017
NCBI Accession #	NP_001789.2
UniProt Primary Accession #	P24941
UniProt Secondary Accession #	O75100; A8K7C6
UniProt Related Accession #	P24941
GenBank Nucleotide #	NM_001798
NCBI Official Full Name	Homo sapiens cyclin-dependent kinase 2 (CDK2), transcript variant 1, mRNA
NCBI Official Synonym Full Names	cyclin-dependent kinase 2
NCBI Official Symbol	CDK2
NCBI Official Synonym Symbols	p33(CDK2)
UniProt Protein Name	Cyclin-dependent kinase 2
UniProt Synonym Protein Names	Cell division protein kinase 2; p33 protein kinase
Protein Family	Cyclin-dependent kinase
UniProt Gene Name	CDK2
UniProt Synonym Gene Names	CDKN2
UniProt Entry Name	CDK2_HUMAN
NCBI Protein Information	cyclin-dependent kinase 2; p33 protein kinase; cell devision kinase 2; cdc2-related protein kinase; cell division protein kinase 2
NCBI Summary for CDK2	The protein encoded by this gene is a member of the Ser/Thr protein kinase family. This protein kinase is highly similar to the gene products of S. cerevisiae cdc28, and S. pombe cdc2. It is a catalytic subunit of the cyclin-dependent protein kinase complex, whose activity is restricted to the G1-S phase, and essential for cell cycle G1/S phase transition. This protein associates with and regulated by the regulatory subunits of the complex including cyclin A or E, CDK inhibitor p21Cip1 (CDKN1A) and p27Kip1 (CDKN1B). Its activity is also regulated by its protein phosphorylation. Two alternatively spliced variants and multiple transcription initiation sites of this gene have been reported. [provided by RefSeq, Jul 2008]

UniProt Comments for CDK2	Function: Serine/threonine-protein kinase involved in the control of the cell cycle; essential for meiosis, but dispensable for mitosis. Phosphorylates CTNNB1, USP37, p53/TP53, NPM1, CDK7, RB1, BRCA2, MYC, NPAT, EZH2. Interacts with cyclins A, B1, B3, D, or E. Triggers duplication of centrosomes and DNA. Acts at the G1-S transition to promote the E2F transcriptional program and the initiation of DNA synthesis, and modulates G2 progression; controls the timing of entry into mitosis/meiosis by controlling the subsequent activation of cyclin B/CDK1 by phosphorylation, and coordinates the activation of cyclin B/CDK1 at the centrosome and in the nucleus. Crucial role in orchestrating a fine balance between cellular proliferation, cell death, and DNA repair in human embryonic stem cells (hESCs). Activity of CDK2 is maximal during S phase and G2; activated by interaction with cyclin E during the early stages of DNA synthesis to permit G1-S transition, and subsequently activated by cyclin A2 (cyclin A1 in germ cells) during the late stages of DNA replication to drive the transition from S phase to mitosis, the G2 phase. EZH2 phosphorylation promotes H3K27me3 maintenance and epigenetic gene silencing. Phosphorylates CABLES1 By similarity. Cyclin E/CDK2 prevents oxidative stress-mediated Ras-induced senescence by phosphorylating MYC. Involved in G1-S phase DNA damage checkpoint that prevents cells with damaged DNA from initiating mitosis; regulates homologous recombination-dependent repair by phosphorylating BRCA2, this phosphorylation is low in S phase when recombination is active, but increases as cells progress towards mitosis. In response to DNA damage, double-strand break repair by homologous recombination a reduction of CDK2-mediated BRCA2 phosphorylation. Phosphorylation of RB1 disturbs its interaction with E2F1. NPM1 phosphorylation by cyclin E/CDK2 promotes its dissociates from unduplicated centrosomes, thus initiating centrosome duplication. Cyclin E/CDK2-mediated phosphorylation of NPAT at G1-S transition and until prophase stimulates the NPAT-mediated activation of histone gene transcription during S phase. Required for vitamin D-mediated growth inhibition by being itself inactivated. Involved in the nitric oxide- (NO) mediated signaling in a nitrosylation/activation-dependent manner. USP37 is activated by phosphorylation and thus triggers G1-S transition. CTNNB1 phosphorylation regulates insulin internalization. Ref.13 Ref.14 Ref.15 Ref.16 Ref.17 Ref.18 Ref.26 Ref.29 Ref.34 Ref.35 Ref.37 Ref.38 Ref.39 Ref.42 Ref.44 Ref.45 Ref.62 Catalytic activity: ATP + a protein = ADP + a phosphoprotein. Enzyme regulation: Phosphorylation at Thr-14 or Tyr-15 inactivates the enzyme, while phosphorylation at Thr-160 activates it. Inhibited by 1,25-dihydroxyvitamin D3 (1,25-(OH)2D3), AG-024322, N-(4-Piperidinyl)-4-(2,6-dichlorobenzoylamino)-1H-pyrazole-3-carboxamide (AT7519), R547 (Ro-4584820), purine, pyrimidine and pyridine derivatives, 2-aminopyrimidines, paullones, thiazo derivatives, macrocyclic quinoxalin-2-one, pyrazolo[1,5-a]-1,3,5-triazine, pyrazolo[1,5-a]pyrimidine, 2-(1-ethyl-2-hydroxyethylamino)-6-benzylamino-9-isopropylpurine (roscovitine, seliciclib and CYC202), SNS-032 (BMS-387032), triazolo[1,5-a]pyrimidines, staurosporine and olomoucine. Stimulated by MYC. Inactivated by CDKN1A (p21). Ref.12 Ref.34 Ref.58 Subunit structure: Found in a complex with CABLES1, CCNA1 and CCNE1. Interacts with CABLES1 By similarity. Interacts with UHRF2. Part of a complex consisting of UHRF2, CDK2 and CCNE1. Interacts with the Speedy/Ringo proteins SPDYA and SPDYC. Found in a complex with both SPDYA and CDKN1B/KIP1. Binds to RB1 and CDK7. Binding to CDKN1A (p21) leads to CDK2/cyclin E inactivation at the G1-S phase DNA damage checkpoint, thereby arresting cells at the G1-S transition during DNA repair. Associated with PTPN6 and beta-catenin/CTNNB1. Interacts with CACUL1. May interact with CEP63. Ref.13 Ref.17 Ref.19 Ref.20 Ref.21 Ref.22 Ref.23 Ref.25 Ref.27 Ref.30 Ref.41 Ref.42 Ref.46 Subcellular location: Cytoplasm › cytoskeleton › microtubule organizing center › centrosome. Nucleus › Cajal body. Cytoplasm. Endosome. Note: Localized at the centrosomes in late G2 phase after separation of the centrosomes but before the start of prophase. Nuclear-cytoplasmic trafficking is mediated during the inhibition by 1,25-(OH)2D3. Ref.16 Ref.29 Ref.34 Ref.42 Induction: Induced transiently by TGFB1 at an early phase of TGFB1-mediated apoptosis. Ref.12 Ref.34 Ref.58 Post-translational modification: Phosphorylated at Thr-160 by CDK7 in a CAK complex. Phosphorylation at Thr-160 promotes kinase activity, whereas phosphorylation at Tyr-15 by WEE1 reduces slightly kinase activity. Phosphorylated on Thr-14 and Tyr-15 during S and G2 phases before being dephosphorylated by CDC25A. Ref.11 Ref.18 Ref.24 Ref.27 Ref.34 Ref.36 Ref.60 Ref.61 Ref.63 Ref.66Nitrosylated after treatment with nitric oxide (DETA-NO). Sequence similarities: Belongs to the protein kinase superfamily. CMGC Ser/Thr protein kinase family. CDC2/CDKX subfamily.Contains 1 protein kinase domain.

Research Articles on CDK2	**1.** CDK7 involved in phosphorylation/activation of CDK4 and CDK6; existence of CDK4-activating kinase(s) other than CDK7; and novel CDK7-dependent positive feedbacks mediated by p21 phosphorylation by CDK4 and CDK2 to sustain CDK4 activation.
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