

Rabbit PLK1 Polyclonal Antibody | anti-PLK1 antibody

Phospho-PLK1 (Ser137) Antibody

CATALOG #	HOST	REACTIVITY	APPLICATIONS
AAA329368	Rabbit	Human, Mouse, Rat	ELISA, Immunohistochemistry, Western Blot

PRODUCT SYNONYMS

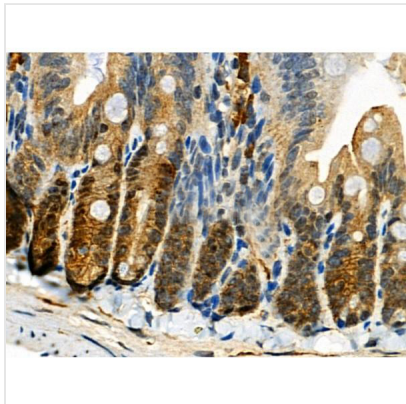
PLK1; Polyclonal Antibody; Phospho-PLK1 (Ser137) Antibody; Cell cycle regulated protein kinase; PLK 1; PLK; PLK-1; plk1; PLK1_HUMAN; Polo like kinase 1; Polo-like kinase 1; Serine/threonine protein kinase 13; Serine/threonine protein kinase PLK1; Serine/threonine-protein kinase 13; Serine/threonine-protein kinase PLK1; STPK 13; STPK13; anti-PLK1 antibody

PRODUCT SPECIFICATIONS

Host	Rabbit
Reactivity	Human, Mouse, Rat
Clonality	Polyclonal
Isotype	Rabbit IgG
Specificity	Phospho-PLK1 (Ser137) Antibody detects endogenous levels of PLK1 only when phosphorylated at Ser137. Tissue Specificity: Placenta and colon.
Purity/Purification	The antibody is from purified rabbit serum by affinity purification via sequential chromatography on phospho-peptide and non-phospho-peptide affinity columns.
Form/Format	Liquid. Rabbit IgG in phosphate buffered saline, pH7.4, 150mM NaCl, 0.02% sodium azide and 50% glycerol.
Concentration	1mg/ml (varies by lot)
Applicable Applications for anti-PLK1 antibody	ELISA (Peptide ELISA), IHC (Immunohistochemistry), WB (Western Blot)
Immunogen	A synthesized peptide derived from human PLK1 around the phosphorylation site of Ser137.
Conjugation	Unconjugated
Fragment	Fab fragment
Post Translational Modifications	Catalytic activity is enhanced by phosphorylation of Thr-210. Phosphorylation at Thr-210 is first detected on centrosomes in the G2 phase of the cell cycle, peaks in prometaphase and gradually disappears from centrosomes during anaphase. Dephosphorylation at Thr-210 at centrosomes is probably mediated by protein phosphatase 1C (PP1C), via interaction with PPP1R12A/MYPT1. Autophosphorylation and phosphorylation of Ser-137 may not be significant for the activation of PLK1 during mitosis, but may enhance catalytic activity during recovery after DNA damage checkpoint. Phosphorylated in vitro by STK10. Ubiquitinated by the anaphase promoting complex/cyclosome (APC/C) in anaphase and following DNA damage, leading to its degradation by the proteasome. Ubiquitination is mediated via its interaction with FZR1/CDH1. Ubiquitination and subsequent degradation prevents entry into mitosis and is essential to maintain an efficient G2 DNA damage checkpoint. Monoubiquitination at Lys-492 by the BCR (KLHL22) ubiquitin ligase complex does not lead to degradation: it promotes PLK1 dissociation from phosphoreceptor proteins and subsequent removal from kinetochores, allowing silencing of the spindle assembly checkpoint (SAC) and chromosome segregation.

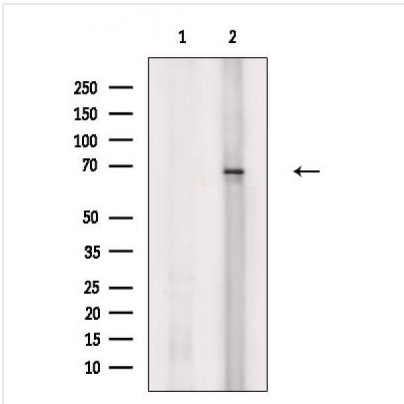
Subunit Structure	Interacts with CEP170 and EVI5. Interacts and phosphorylates ERCC6L. Interacts with FAM29A. Interacts with SLX4/BTBD12 and TTDN1. Interacts with BUB1B. Interacts (via POLO-box domain) with the phosphorylated form of BUB1, CENPU and CDC25C. Interacts with isoform 3 of SGO1. Interacts with BORA, KIF2A and AURKA. Interacts with TOPORS and CYLD. Interacts with ECT2; the interaction is stimulated upon phosphorylation of ECT2 on 'Thr-444'. Interacts with PRC1. Interacts with KIF20A/MKLP2 (when phosphorylated), leading to the recruitment at the central spindle. Interacts (via POLO box domains) with PPP1R12A/MYPT1 (when previously phosphorylated by CDK1). Part of an astrin (SPAG5)-kinastrin (SKAP) complex containing KNSTRN, SPAG5, PLK1, DYNLL1 and SGO2. Interacts with BIRC6/bruce. Interacts with CDK1-phosphorylated FRY; this interaction occurs in mitotic cells, but not in interphase cells. FRY interaction facilitates AURKA-mediated PLK1 phosphorylation. Interacts with CDK1-phosphorylated DCTN6 during mitotic prometaphase; the interaction facilitates recruitment to kinetochores. Interacts with CEP68; the interaction phosphorylates CEP68. Interacts (via POLO-box domain) with DCTN1. Interacts with FOPNL in later G1, S, G2 and M phases of the cell cycle; this interaction recruits PLK1 to centrosomes, a step required for S phase progression. Interacts with HSF1; this interaction increases upon heat shock but does not modulate neither HSF1 homotrimerization nor DNA-binding activities. Interacts with HNRNPU; this interaction induces phosphorylation of HNRNPU in mitosis. Interacts (via its N-terminus) to RIOK2. Interacts with KLHL22.
Similarity	The POLO box domains act as phosphopeptide-binding module that recognize and bind serine-[phosphothreonine/phosphoserine]- (proline/X) motifs. PLK1 recognizes and binds docking proteins that are already phosphorylated on these motifs, and then phosphorylates them. PLK1 can also create its own docking sites by mediating phosphorylation of serine-[phosphothreonine/phosphoserine]- (proline/X) motifs subsequently recognized by the POLO box domains.Belongs to the protein kinase superfamily. Ser/Thr protein kinase family. CDC5/Polo subfamily.
Subcellular Location	Nucleus. Chromosome>Centromere>Kinetochores. Cytoplasm>Cytoskeleton>Microtubule organizing center>Centrosome. Cytoplasm>Cytoskeleton>Spindle. Midbody. Note: localization at the centrosome starts at the G1/S transition (PubMed:24018379). During early stages of mitosis, the phosphorylated form is detected on centrosomes and kinetochores. Localizes to the outer kinetochores. Presence of SGO1 and interaction with the phosphorylated form of BUB1 is required for the kinetochores localization. Localizes onto the central spindle by phosphorylating and docking at midzone proteins KIF20A/MKLP2 and PRC1. Colocalizes with FRY to separating centrosomes and spindle poles from prophase to metaphase in mitosis, but not in other stages of the cell cycle. Localization to the centrosome is required for S phase progression (PubMed:24018379). Colocalizes with HSF1 at the spindle poles during prometaphase (PubMed:18794143).
Preparation and Storage	Store at -20 degree C. Stable for 12 months from date of receipt.

IMAGES



IHC (Immunohiostchemistry)

Staining Mouse colorectal tissue by IHC-P. The sample was formaldehyde fixed and a heat mediated antigen retrieval step in citrate buffer was performed. The sample was then blocked and incubated with the primary antibody at 4 degree C overnight. An HRP conjugated anti-Rabbit antibody was used as the secondary antibody.



WB (Western Blot)

Western blot analysis of extracts from Rat testis, using Phospho-PLK1 (Ser137) Antibody. The lane on the left was treated with blocking peptide.

ADDITIONAL INFORMATION

Related Product Information for anti-PLK1 antibody	Serine/threonine-protein kinase that performs several important functions throughout M phase of the cell cycle, including the regulation of centrosome maturation and spindle assembly, the removal of cohesins from chromosome arms, the inactivation of anaphase-promoting complex/cyclosome (APC/C) inhibitors, and the regulation of mitotic exit and cytokinesis. Polo-like kinase proteins acts by binding and phosphorylating proteins are that already phosphorylated on a specific motif recognized by the POLO box domains. Phosphorylates BORA, BUB1B/BUBR1, CCNB1, CDC25C, CEP55, ECT2, ERCC6L, FBXO5/EMI1, FOXM1, KIF20A/MKLP2, CENPU, NEDD1, NINL, NPM1, NUDC, PKMYT1/MYT1, KIZ, PPP1R12A/MYPT1, PRC1, RACGAP1/CYK4, SGO1, STAG2/SA2, TEX14, TOPORS, p73/TP73, TPT1, WEE1 and HNRNPU. Plays a key role in centrosome functions and the assembly of bipolar spindles by phosphorylating KIZ, NEDD1 and NINL. NEDD1 phosphorylation promotes subsequent targeting of the gamma-tubulin ring complex (gTuRC) to the centrosome, an important step for spindle formation. Phosphorylation of NINL component of the centrosome leads to NINL dissociation from other centrosomal proteins. Involved in mitosis exit and cytokinesis by phosphorylating CEP55, ECT2, KIF20A/MKLP2, CENPU, PRC1 and RACGAP1. Recruited at the central spindle by phosphorylating and docking PRC1 and KIF20A/MKLP2; creates its own docking sites on PRC1 and KIF20A/MKLP2 by mediating phosphorylation of sites subsequently recognized by the POLO box domains. Phosphorylates RACGAP1, thereby creating a docking site for the Rho GTP exchange factor ECT2 that is essential for the cleavage furrow formation. Promotes the central spindle recruitment of ECT2. Plays a central role in G2/M transition of mitotic cell cycle by phosphorylating CCNB1, CDC25C, FOXM1, CENPU, PKMYT1/MYT1, PPP1R12A/MYPT1 and WEE1. Part of a regulatory circuit that promotes the activation of CDK1 by phosphorylating the positive regulator CDC25C and inhibiting the negative regulators WEE1 and PKMYT1/MYT1. Also acts by mediating phosphorylation of cyclin-B1 (CCNB1) on centrosomes in prophase. Phosphorylates FOXM1, a key mitotic transcription regulator, leading to enhance FOXM1 transcriptional activity. Involved in kinetochore functions and sister chromatid cohesion by phosphorylating BUB1B/BUBR1, FBXO5/EMI1 and STAG2/SA2. PLK1 is high on non-attached kinetochores suggesting a role of PLK1 in kinetochore attachment or in spindle assembly checkpoint (SAC) regulation. Required for kinetochore localization of BUB1B. Regulates the dissociation of cohesin from chromosomes by phosphorylating cohesin subunits such as STAG2/SA2. Phosphorylates SGO1: required for spindle pole localization of isoform 3 of SGO1 and plays a role in regulating its centriole cohesion function. Mediates phosphorylation of FBXO5/EMI1, a negative regulator of the APC/C complex during prophase, leading to FBXO5/EMI1 ubiquitination and degradation by the proteasome. Acts as a negative regulator of p53 family members: phosphorylates TOPORS, leading to inhibit the sumoylation of p53/TP53 and simultaneously enhance the ubiquitination and subsequent degradation of p53/TP53. Phosphorylates the transactivation domain of the transcription factor p73/TP73, leading to inhibit p73/TP73-mediated transcriptional activation and pro-apoptotic functions. Phosphorylates BORA, and thereby promotes the degradation of BORA. Contributes to the regulation of AURKA function. Also required for recovery after DNA damage checkpoint and entry into mitosis. Phosphorylates MISP, leading to stabilization of cortical and astral microtubule attachments required for proper spindle positioning. Together with MEIKIN, acts as a regulator of kinetochore function during meiosis I: required both for mono-orientation of kinetochores on sister chromosomes and protection of centromeric cohesin from separase-mediated cleavage (By similarity). Phosphorylates CEP68 and is required for its degradation. Regulates nuclear envelope breakdown during prophase by phosphorylating DCTN1 resulting in its localization in the nuclear envelope. Phosphorylates the heat shock transcription factor HSF1, promoting HSF1 nuclear translocation upon heat shock. Phosphorylates HSF1 also in the early mitotic period; this phosphorylation regulates HSF1 localization to the spindle pole, the recruitment of the SCF (BTRC) ubiquitin ligase complex inducing HSF1 degradation, and hence mitotic progression. Regulates mitotic progression by phosphorylating RIOK2.
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NCBI AND UNIPROT INFORMATION

NCBI GI #	21359873
NCBI GeneID	5347
NCBI Accession #	NP_005021.2
NCBI GenBank Nucleotide #	NM_005030.3
UniProt Accession #	P53350; Q15153; Q99746
Molecular Weight	68,255 Da
NCBI Official Full Name	serine/threonine-protein kinase PLK1
NCBI Official Synonym Full Names	polo-like kinase 1
NCBI Official Symbol	PLK1

NCBI Official Synonym Symbols	PLK; STPK13
NCBI Protein Information	serine/threonine-protein kinase PLK1; PLK-1; polo like kinase; polo (Drosophia)-like kinase; serine/threonine-protein kinase 13; cell cycle regulated protein kinase
UniProt Protein Name	Serine/threonine-protein kinase PLK1
UniProt Gene Name	PLK1
UniProt Synonym Gene Names	PLK; PLK-1; STPK13
UniProt Entry Name	PLK1_HUMAN

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