

p-Cdc6 (Ser 54): sc-12920

BACKGROUND

Cdc6 is essential for DNA replication. Phosphorylation of Cdc6 is regulated during the cell cycle. *In vitro*, Cdc6 is an excellent substrate for Cdk2, while *in vivo*, Cdc6 is phosphorylated at three sites (Serine 54, Serine 74 and Serine 106). Serine 54, Serine 74 and Serine 106 are also phosphorylated by Cdk2 *in vitro*, which strongly suggests that Cdc6 is an endogenous Cdk substrate. Phosphorylation of Cdc6 by Cdk2 regulates DNA replication by promoting initiation of DNA replication and, subsequently, by preventing DNA rereplication through nuclear exclusion. Cdc6 is nuclear in G₁, but translocates to the cytoplasm at the start of S phase via CRM1-dependent export. CRM1 binds to its cargo in the nucleus in the presence of a small nuclear GTPase protein, RanGTP. After the RanGTP-CRM1-cargo complex is translocated from the nucleus to the cytoplasm, RanGTP is hydrolyzed to RanGDP, causing the cargo to dissociate from CRM1.

REFERENCES

1. Stade, K., et al. 1997. Exportin 1 (CRM1p) is an essential nuclear export factor. *Cell* 90: 1041-1050.
2. Yan, Z., et al. 1998. Cdc6 is regulated by E2F and is essential for DNA replication in mammalian cells. *Proc. Natl. Acad. Sci. USA* 95: 3603-3608.
3. Stoeber, K., et al. 1998. Cdc6 protein causes premature entry into S phase in a mammalian cell-free system. *EMBO J.* 17: 7219-7229.
4. Saha, P., et al. 1998. Human Cdc6/Cdc18 associates with Orc1 and cyclin-Cdk and is selectively eliminated from the nucleus at the onset of S phase. *Mol. Cell. Biol.* 18: 2758-2767.
5. Jiang, W., et al. 1999. Multistep regulation of DNA replication by Cdk phosphorylation of HsCdc6. *Proc. Natl. Acad. Sci. USA* 96: 6193-6198.

CHROMOSOMAL LOCATION

Genetic locus: CDC6 (human) mapping to 17q21.2; Cdc6 (mouse) mapping to 11 D.

SOURCE

p-Cdc6 (Ser 54) is available as either goat (sc-12920) or rabbit (sc-12920-R) polyclonal affinity purified antibody raised against a short amino acid sequence containing Ser 54 phosphorylated Cdc6 of human origin.

PRODUCT

Each vial contains 200 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-12920 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

APPLICATIONS

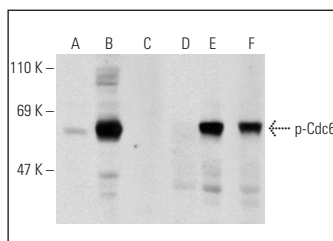
p-Cdc6 (Ser 54) is recommended for detection of Ser 54 phosphorylated Cdc6 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

p-Cdc6 (Ser 54) is also recommended for detection of correspondingly phosphorylated Cdc6 in additional species, including equine, canine, bovine and porcine.

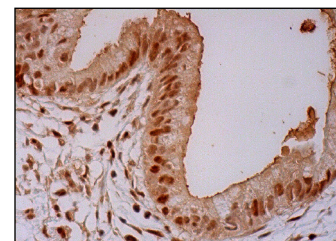
Suitable for use as control antibody for Cdc6 siRNA (h): sc-29258, Cdc6 siRNA (m): sc-35046, Cdc6 shRNA Plasmid (h): sc-29258-SH, Cdc6 shRNA Plasmid (m): sc-35046-SH, Cdc6 shRNA (h) Lentiviral Particles: sc-29258-V and Cdc6 shRNA (m) Lentiviral Particles: sc-35046-V.

Molecular Weight of p-Cdc6: 62 kDa.

DATA



Western blot analysis of Cdc6 phosphorylation in untreated (A,D), serum starved and serum treated (B,E) and serum starved, serum treated and lambda protein phosphatase (sc-200312A) treated (C,F) HeLa whole cell lysates. Antibodies tested include p-Cdc6 (Ser 54)-R: sc-12920-R (A,B,C) and Cdc6 (D-F): sc-13136 (D,E,F).



p-Cdc6 (Ser 54): sc-12920. Immunoperoxidase staining of formalin fixed, paraffin-embedded human gall bladder tissue showing nuclear and cytoplasmic staining of glandular cells.

SELECT PRODUCT CITATIONS

1. Alexandrow, M.G. and Hamlin, J.L. 2004. Cdc6 chromatin affinity is unaffected by Serine 54 phosphorylation, S phase progression, and overexpression of cyclin A. *Mol. Cell. Biol.* 24: 1614-1627.
2. Duursma A and Agami R. 2005. p53-Dependent regulation of Cdc6 protein stability controls cellular proliferation. *Mol. Cell. Biol.* 25: 6937-6947.
3. Mailand, N. and Diffley, J.F. 2005. CDKs promote DNA replication origin licensing in human cells by protecting Cdc6 from APC/C-dependent proteolysis. *Cell* 122: 915-926.
4. Geng, Y., et al. 2007. Kinase-independent function of cyclin E. *Mol. Cell* 25: 127-139.
5. Kan, Q., et al. 2008. ATP-dependent activation of p21^{WAF1}/CIP1-associated Cdk2 by Cdc6. *Proc. Natl. Acad. Sci. USA* 105: 4757-4762.
6. Paolinelli, R., et al. 2009. Acetylation by GCN5 regulates Cdc6 phosphorylation in the S phase of the cell cycle. *Nat. Struct. Mol. Biol.* 16: 412-420.