SANTA CRUZ BIOTECHNOLOGY, INC.

Cdc7 (SPM171): sc-56275

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

The Dbf4/Cdc7 protein kinase is essential for the activation of replication origins during S phase. Cdc7/Dbf4 efficiently phosphorylates several proteins that are required for the initiation of DNA replication, including five of the six minichromosome maintenance (Mcm) proteins and the p180 subunit of DNA polymerase α-primase. This protein complex consists of the catalytic subunit Cdc7 associating with the regulatory and activating subunit Dbf4. The kinase activity of the complex is regulated throughout the cell cycle, mainly by fluctuating levels of Dbf4. Cdc7 is consistently expressed throughout the cell cycle, while the expression of Dbf4 is absent during G_1 phase and accumulates during S and G_2 phases. The anaphase-promoting complex rapidly degrades Dbf4 at the time of chromosome segregation, and the stability of Dbf4 remains low during pre-Start G_1 phase. The coordinated degradation of Dbf4 and the time of chromosome separation is important to ensuring that prereplicative complexes, which assemble after chromosome segregation, do not immediately refire.

REFERENCES

1. Bousset, K. and Diffley, J.F. 1998. The Cdc7 protein kinase is required for origin firing during S phase. Genes Dev. 12: 480-490.
2. Lepke, M., et al. 1999. Identification, characterization and chromosomal localization of the cognate human and murine DBF4 genes. Mol. Gen. Genet. 262: 220-229.
3. Masai, H., et al. 1999. Cdc7 kinase complex as a molecular switch for DNA replication. Front. Biosci. 4: D834-D840.

CHROMOSOMAL LOCATION

Genetic locus: CDC7 (human) mapping to 1p22.2.

SOURCE

Cdc7 (SPM171) is a mouse monoclonal antibody raised against recombinant full length Cdc7 of human origin.

PRODUCT

Each vial contains 200 µg IgG_1 kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

Cdc7 (SPM171) is recommended for detection of Cdc7 of 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) and immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for Cdc7 siRNA (h): sc-37549, Cdc7 shRNA Plasmid (h): sc-37549-SH and Cdc7 shRNA (h) Lentiviral Particles: sc-37549-V.

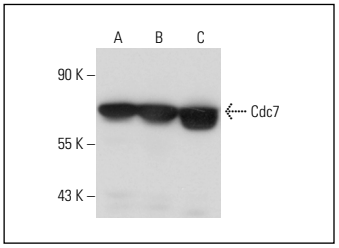
Molecular Weight of Cdc7: 64 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200, Y79 cell lysate: sc-2240 or ECV304 cell lysate: sc-2269.

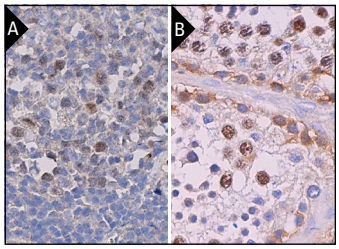
STORAGE

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

DATA



Cdc7 (SPM171): sc-56275. Western blot analysis of Cdc7 expression in HeLa (**A**), ECV304 (**B**) and Y79 (**C**) whole cell lysates.



Cdc7 (SPM171): sc-56275. Immunoperoxidase staining of formalin fixed, paraffin-embedded human lymph node tissue showing nuclear staining of subset of cells in germinal center (**A**). Immunoperoxidase staining of formalin fixed, paraffin-embedded human testis tissue showing nuclear staining of cells in seminiferous ducts (**B**).

SELECT PRODUCT CITATIONS

1. Georges, S.A., et al. 2008. Coordinated regulation of cell cycle transcripts by p53-inducible microRNAs, miR-192 and miR-215. Cancer Res. 68: 10105-10112.
2. Cao, J.X., et al. 2014. MiR-630 inhibits proliferation by targeting Cdc7 kinase, but maintains the apoptotic balance by targeting multiple modulators in human lung cancer A549 cells. Cell Death Dis. 5: e1426.
3. Chirackal Manavalan, A.P., et al. 2019. CDK12 controls G_1/S progression by regulating RNAPII processivity at core DNA replication genes. EMBO Rep. 20: e47592.
4. Cao, J.X. 2019. MiR-888 regulates cancer progression by targeting multiple targets in lung adenocarcinoma. Oncol. Rep. 41: 3367-3376.
5. Vaca, G., et al. 2021. Therapeutic potential of novel cell division cycle kinase 7 inhibitors on TDP-43-related pathogenesis such as frontotemporal lobar degeneration (FTLD) and amyotrophic lateral sclerosis (ALS). J. Neurochem. 156: 379-390.
6. Neizer-Ashun, F., et al. 2022. KRCC1, a modulator of the DNA damage response. Nucleic Acids Res. 50: 11028-11039.
7. Li, J., et al. 2023. The human pre-replication complex is an open complex. Cell 186: 98-111.e21.
8. Yang, Y., et al. 2023. αKG-driven RNA polymerase II transcription of cyclin D1 licenses malic enzyme 2 to promote cell-cycle progression. Cell Rep. 42: 112770.
9. Kim, S.J., et al. 2023. Firing of replication origins is disturbed by a CDK4/6 inhibitor in a pRb-independent manner. Int. J. Mol. Sci. 24: 10629.

RESEARCH USE

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