SANTA CRUZ BIOTECHNOLOGY, INC.

Cdc7 (DCS-341): sc-56274

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., et al. 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: 834-840.
4. Weinreich, M., et al. 1999. Cdc7p/Dbf4p kinase binds to chromatin during S phase and is regulated by both the APC and the Rad53 checkpoint pathway. EMBO J. 18: 5334-5346.
5. Jiang, W., et al. 1999. Mammalian Cdc7/Dbf4 protein kinase complex is essential for initiation of DNA replication. EMBO J. 18: 5703-5713.
6. Pasero, P., et al. 1999. A role for the Cdc7 kinase regulatory subunit Dbf4p in the formation of initiation-competent origins of replication. Genes Dev. 13: 2159-2176.

CHROMOSOMAL LOCATION

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

SOURCE

Cdc7 (DCS-341) is a mouse monoclonal antibody raised against 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.

STORAGE

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

APPLICATIONS

Cdc7 (DCS-341) 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 solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

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.

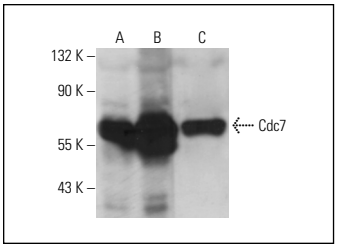
Molecular Weight of Cdc7: 64 kDa.

Positive Controls: Y79 cell lysate: sc-2240, HCT-116 whole cell lysate: sc-364175 or ECV304 cell lysate: sc-2269.

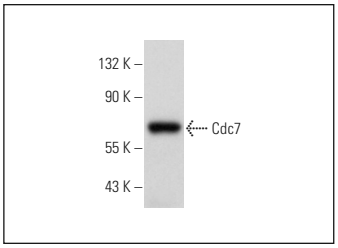
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

DATA



Cdc7 (DCS-341): sc-56274. Western blot analysis of Cdc7 expression in ECV304 (**A**), Y79 (**B**) and HCT-116 (**C**) whole cell lysates.



Cdc7 (DCS-341): sc-56274. Western blot analysis of Cdc7 expression in Saos-2 whole cell lysate.

SELECT PRODUCT CITATIONS

1. Iwai, K., et al. 2019. Molecular mechanism and potential target indication of TAK-931, a novel Cdc7-selective inhibitor. Sci. Adv. 5: eaav3660.
2. Pennycook, B.R., et al. 2020. E2F-dependent transcription determines replication capacity and S phase length. Nat. Commun. 11: 3503.
3. Iwai, K., et al. 2021. A Cdc7 inhibitor sensitizes DNA-damaging chemotherapies by suppressing homologous recombination repair to delay DNA damage recovery. Sci. Adv. 7: eabf0197.

RESEARCH USE

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