

# Cdc7 siRNA (m): sc-37550

## 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  $\alpha$ -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<sub>1</sub> phase and accumulates during S and G<sub>2</sub> 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<sub>1</sub> 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

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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.
7. Ferreira, M.F., et al. 2000. Dbf4p, an essential S phase-promoting factor, is targeted for degradation by the anaphase-promoting complex. *Mol. Cell. Biol.* 20: 242-248.
8. Masai, H., et al. 2006. Phosphorylation of MCM4 by Cdc7 kinase facilitates its interaction with Cdc45 on the chromatin. *J. Biol. Chem.* 281: 39249-39261.
9. Tenca, P., et al. 2007. Cdc7 is an active kinase in human cancer cells undergoing replication stress. *J. Biol. Chem.* 282: 208-215.

## CHROMOSOMAL LOCATION

Genetic locus: Cdc7 (mouse) mapping to 5 E5.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.

## PRODUCT

Cdc7 siRNA (m) is a pool of 3 target-specific 19-25 nt siRNAs designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Cdc7 shRNA Plasmid (m): sc-37550-SH and Cdc7 shRNA (m) Lentiviral Particles: sc-37550-V as alternate gene silencing products.

For independent verification of Cdc7 (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-37550A, sc-37550B and sc-37550C.

## STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNAses and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330  $\mu$ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330  $\mu$ l of RNase-free water makes a 10  $\mu$ M solution in a 10  $\mu$ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

## APPLICATIONS

Cdc7 siRNA (m) is recommended for the inhibition of Cdc7 expression in mouse cells.

## SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10  $\mu$ M in 66  $\mu$ l. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Cdc7 gene expression knockdown using RT-PCR Primer: Cdc7 (m)-PR: sc-37550-PR (20  $\mu$ l). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## RESEARCH USE

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