Revision 1

Store at -20C

#3603

# Cdc7 Antibody

Cell Signaling TECHNOLOGY®

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**For Research Use Only. Not for Use in Diagnostic Procedures.**

| Applications: | Reactivity: | Sensitivity: | MW (kDa): | Source/Isotype: | UniProt ID: | Entrez-Gene Id: |
|---|---|---|---|---|---|---|
| W | H M R Hm | Endogenous | 64 | Rabbit | #O00311 | 8317 |

## Product Usage Information

| Application | Dilution |
|---|---|
| Western Blotting | 1:1000 |

## Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA and 50% glycerol. Store at –20°C. Do not aliquot the antibody.

## Specificity/Sensitivity

Cdc7 Antibody detects endogenous levels of total cdc7 protein.

## Source / Purification

Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to residues near the amino terminus of human cdc7.

## Background

The initiation of DNA replication in mammalian cells is a highly coordinated process that ensures duplication of the genome only once per cell division cycle. Origins of replication are dispersed throughout the genome, and their activities are regulated via the sequential binding of pre-replication and replication factors. The origin recognition complex (ORC) is thought to be bound to chromatin throughout the cell cycle (1,2). The pre-replication complex (Pre-RC) forms in late mitosis/early G1 phase beginning with the binding of cdt1 and cdc6 to the origin, which allows binding of the heterohexameric MCM2-7 complex. The MCM complex is thought to be the replicative helicase, and formation of the pre-RC is referred to as chromatin licensing. Subsequent initiation of DNA replication requires the activation of the S-phase promoting kinases cdk2 and cdc7. Cdc7, which is active only in complex with its regulatory subunit dbf4, phosphorylates MCM proteins bound to chromatin and allows binding of the replication factor cdc45 and DNA polymerase (3,4).
The import of cdc7 to the nucleus is regulated by importin-β (5) and its binding to the origin of replication is dependent on the regulation of its localization via three domains, a nuclear localization sequence (NLS), a nuclear retention sequence (NRS) and a nuclear export sequence (NES) (6).
Expression of cdc7 and dbf4 has been shown to be increased in human cancer cell lines and tissue (7); a chemical inhibitor of cdc7 blocks initiation of DNA replication and causes apoptosis in cancer cells (8).
Cdc7 is also involved in activating ATR/Chk1 in response to DNA damage (9,10).

## Background References

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3. Bell, S.P. and Dutta, A. (2002) *Annu Rev Biochem* 71, 333-74.
4. Tsuji, T. et al. (2006) *Mol Biol Cell* 17, 4459-72.
5. Kim, B.J. and Lee, H. (2006) *J Biol Chem* 281, 12041-9.
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7. Bonte, D. et al. (2008) *Neoplasia* 10, 920-31.
8. Montagnoli, A. et al. (2008) *Nat Chem Biol* 4, 357-65.
9. Heffernan, T.P. et al. (2007) *J Biol Chem* 282, 9458-68.
10. Kim, J.M. et al. (2008) *Oncogene* 27, 3475-82.

## Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

## Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

## Applications Key

**W:** Western Blotting

## Cross-Reactivity Key

**H:** Human **M:** Mouse **R:** Rat **Hm:** Hamster

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