SANTA CRUZ BIOTECHNOLOGY, INC.

MCM4 (C-20): sc-9840

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The Power to Question

BACKGROUND

The mini-chromosome maintenance (MCM) family of proteins, including MCM2, MCM3, MCM4 (Cdc21), MCM5 (Cdc46), MCM6 (Mis5) and MCM7 (Cdc47), are regulators of DNA replication that act to ensure replication occurs only once in the cell cycle. Expression of MCM proteins increases during cell growth, peaking at G_1 to S phase. The MCM proteins each contain an ATP-binding motif, which is predicted to mediate ATP-dependent opening of double-stranded DNA. MCM proteins are regulated by E2F transcription factors, which induce MCM expression, and by protein kinases, which interact with MCM proteins to maintain the postreplicative state of the cell. MCM2/MCM4 complexes function as substrates for Cdc2/cyclin B *in vitro*. Cleavage of MCM3, which can be prevented by caspase inhibitors, results in the inactivation of the MCM complex (composed of at least MCM proteins 2-6) during apoptosis. A complex composed of MCM4, MCM6 and MCM7 has been shown to be involved in DNA helicase activity; and MCM5 is involved in IFN-γ-induced Stat1α transcription activation.

REFERENCES

1. Koonin, E.V. 1993. A common set of conserved motifs in a vast variety of putative nucleic acid-dependent ATPases including MCM proteins involved in the initiation of eukaryotic DNA replication. Nucleic Acids Res. 21: 2541-2547.
2. Ishimi, Y. 1997. A DNA helicase activity is associated with an MCM4, -6, and -7 protein complex. J. Biol. Chem. 272: 24508-24513.
3. Leone, G., et al. 1998. E2F3 activity is regulated during the cell cycle and is required for the induction of S phase. Genes Dev. 12: 2120-2130.
4. Coverley, D., et al. 1998. Protein kinase inhibition in G_2 causes mammalian MCM proteins to reassociate with chromatin and restores ability to replicate. Exp. Cell Res. 238: 63-69.
5. Fujita, M., et al. 1998. Cell cycle- and chromatin binding state-dependent phosphorylation of human MCM heterohexameric complexes. A role for cdc2 kinase. J. Biol. Chem. 273: 17095-17101.
6. Schwab, B.L., et al. 1998. Selective proteolysis of the nuclear replication factor MCM3 in apoptosis. Exp. Cell Res. 238: 415-421.

CHROMOSOMAL LOCATION

Genetic locus: MCM4 (human) mapping to 8q11.21; Mcm4 (mouse) mapping to 16 A2.

SOURCE

MCM4 (C-20) is an affinity purified goat polyclonal antibody raised against a peptide mapping at the C-terminus of MCM4 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-9840 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

APPLICATIONS

MCM4 (C-20) is recommended for detection of MCM4 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), 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).

MCM4 (C-20) is also recommended for detection of MCM4 in additional species, including equine, canine, bovine, porcine and avian.

Suitable for use as control antibody for MCM4 siRNA (h): sc-37619, MCM4 siRNA (m): sc-37620, MCM4 shRNA Plasmid (h): sc-37619-SH, MCM4 shRNA Plasmid (m): sc-37620-SH, MCM4 shRNA (h) Lentiviral Particles: sc-37619-V and MCM4 shRNA (m) Lentiviral Particles: sc-37620-V.

Molecular Weight of MCM4: 100 kDa.

Positive Controls: HeLa nuclear extract: sc-2120, NIH/3T3 nuclear extract: sc-2138 or KNRK nuclear extract: sc-2141.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use donkey anti-goat IgG-HRP: sc-2020 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible donkey anti-goat IgG-HRP: sc-2033 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use donkey anti-goat IgG-FITC: sc-2024 (dilution range: 1:100-1:400) or donkey anti-goat IgG-TR: sc-2783 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

SELECT PRODUCT CITATIONS

1. Kan, Q., et al. 2008. ATP-dependent activation of $p21^{WAF1/CIP1}$-associated Cdk2 by Cdc6. Proc. Natl. Acad. Sci. USA 105: 4757-4762.
2. Kan, Q., et al. 2008. Cdc6 determines utilization of $p21^{WAF1/CIP1}$-dependent damage checkpoint in S phase cells. J. Biol. Chem. 283: 17864-17872.

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.