SANTA CRUZ BIOTECHNOLOGY, INC.

Mcm4 (D-7): sc-166037

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUNDBACKGROUND

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.
7. Zhang, J.J., et al. 1998. Ser 727-dependent recruitment of MCM5 by Stat1α in IFN-γ-induced transcriptional activation. EMBO J. 17: 6963-6971.
8. Iwanaga, Y., et al. 1999. Human T cell leukemia virus type 1 tax protein abrogates interleukin-2 dependence in a mouse T cell line. J. Virol. 73: 1271-1277.

SOURCE

Mcm4 (D-7) is a mouse monoclonal antibody raised against amino acids 1-300 mapping at the N-terminus of Mcm4 of *Saccharomyces cerevisiae* origin.

PRODUCT

Each vial contains 200 µg IgG_{2a} kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

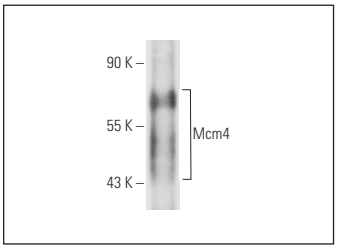
Mcm4 (D-7) is recommended for detection of Mcm4 of *Saccharomyces cerevisiae* origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Molecular Weight of Mcm4: 100 kDa.

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



Mcm4 (D-7): sc-166037. Western blot analysis of yeast recombinant Mcm4 fusion protein.

SELECT PRODUCT CITATIONS

1. Keil, K.P., et al. 2018. PCB 95 promotes dendritic growth in primary rat hippocampal neurons via mTOR-dependent mechanisms. Arch. Toxicol. 92: 3163-3173.
2. Jenkinson, F., et al. 2023. Dephosphorylation of the pre-initiation complex is critical for origin firing. Mol. Cell 83: 12-25.e10.

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.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.