

## Product Information

### **MONOCLONAL ANTI- MCM7 (CDC47) CLONE DCS-141 Mouse Ascites Fluid**

Product Number **M7931**

#### **Product Description**

Monoclonal Anti-MCM7 (CDC47) (mouse IgG1 isotype) is derived from the DCS-141 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from BALB/c mice immunized with a recombinant human MCM7. The isotype is determined using Sigma ImmunoType™ Kit (Sigma ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Sigma ISO-2).

Monoclonal Anti-MCM7 (CDC47) recognizes human MCM7 (CDC47, 80kD and a weaker lower doublet), applying immunoblotting. The product is also useful in immunocytochemistry and immunoprecipitation. Cross-reactivity has been observed with human and *Xenopus* MCM7 (CDC47).

The transmission of genetic information from one cell generation to the next requires the accurate duplication of the DNA during the S phase of the cell cycle. In eukaryotic cells, all genomic DNA is replicated once and only once per cell cycle. Initiation of DNA replication is a highly regulated process that requires the ordered assembly of many proteins at the origins of DNA replication to form a competent, pre-replicative chromosomal state, and cell cycle regulated protein kinase pathways that affect a transition to a post-replicative chromosomal state.<sup>1</sup> Genetic studies in yeast and in higher eukaryotes have pointed to a role for the minichromosome maintenance (MCM) family of proteins in contributing to the competent state of replication in G1 phase.<sup>2,3</sup> There are at least five MCM proteins in the yeast *S. cerevisiae*: MCM2, MCM3, MCM4 (CDC54), MCM5 (CDC46) and MCM7 (CDC47). Homologous family of proteins have been found in *Xenopus* and higher eukaryotes, including mice and humans (which are also designated XM CM2, XMCM3 etc.) The MCM proteins interact with each other to form a multi-protein complex.<sup>2,4</sup> They become bound to chromatin during the late mitosis, helping to

establish a competent state for chromosome replication in the G1 phase and remain there until they are gradually removed as S phase progresses.<sup>4</sup> At mitosis, MCM7 (a doublet of 83-96 kD) enters the nucleus where it remains until soon after initiation of DNA replication but becomes released from the chromatin. MCM7 levels do not vary with cell cycle, but expression and nascent synthesis of MCM7 occur late in the cell cycle, coinciding with mitosis.<sup>5</sup> Consequently, it is absent in quiescent cells. MCM7 may play a role in normal and neoplastic cell growth, as indicated by the observation that malignant lesions contain more nuclear MCM7-positive cells than their normal counterparts.<sup>6</sup> Therefore, MCM7 immunolocalization may be used as an index of cell proliferation in tissue sections. Monoclonal antibody reacting specifically with MCM7 is also a useful tool in the investigation of the molecular mechanisms that determine how DNA replication is initiated, how it is restricted to S phase, and how replication occurs in cells.

#### **Reagents**

The product is provided as ascites fluid with 15 mM sodium azide (see MSDS)\* as a preservative.

#### **Precautions and Disclaimer**

\* Due to the sodium azide content a material safety sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazardous and safe handling practices.

#### **Storage/Stability**

For continuous use, store at 2-8°C for up to one month. For extended storage freeze in working aliquots. Repeated freezing and thawing is not recommended. Storage in "frost-free" freezers is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use.

**Product Profile**

A minimum working dilution of 1:2,000 is determined by immunoblotting, using HeLa cells nuclear preparation.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working dilutions by titration test.

**References**

1. Stillman, B., *Science*, **274**, 1659 (1996).
2. Chong, J.P.J., et al., *Nature*, **375**, 418 (1995).
3. Botchan, M., *Proc. Natl. Acad. Sci. USA*, **93**, 9997 (1996).
4. Romanowski, P., et al., *Proc. Natl. Acad. Sci. USA*, **93**, 10189 (1996).
5. Dalton, S., and Whitbread, L., *Proc. Natl. Acad. Sci. USA*, **92**, 2514 (1995).
6. Hiraiwa, A., et al., *Int. J. Cancer*, **74**, 180 (1997)

lpg 3/99

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.