

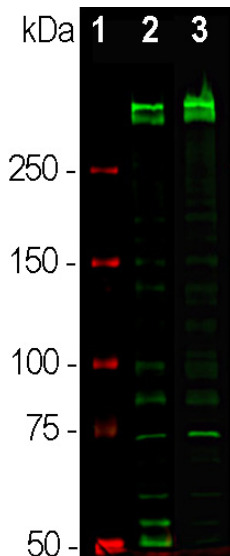
Ordering Information
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HGNC Name: MKI67
UniProt: P46013
RRID: AB_2637052
Immunogen: Recombinant construct containing the N-terminal 300 amino acids of the human sequence expressed in and purified from *E. coli*.
Format: Purified antibody at 1mg/mL in 50% PBS, 50% glycerol, 5mM azide
Storage: Store at 4°C for short term. For longer term, store at -20°C
Recommended dilutions:
 WB: 1:1,000-5,000. IF 1:2,000-5,000

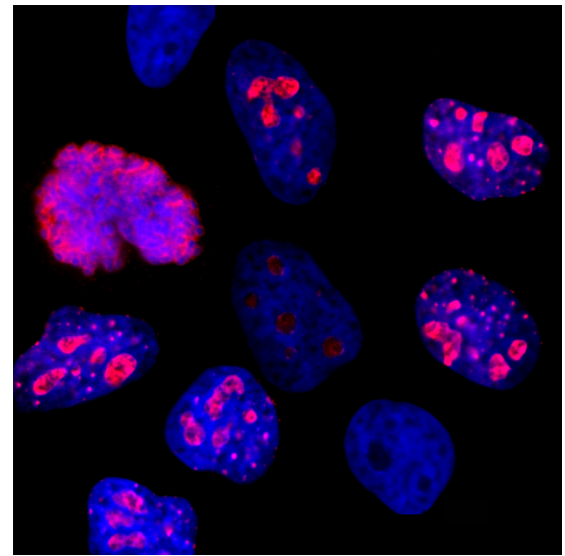
References:

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2. Kill IR, Faragher RGA, Lawrence K, Shall S. The expression of proliferation-dependent antigens during the lifespan of normal and progeroid human fibroblasts in culture. *J. Cell Sci.* 107:571-9 (1994).
3. Yerushalmi R, et al. Ki67 in breast cancer: Prognostic and predictive potential. *Lancet Oncol.* 11:174-83 (2010).
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5. Ishihara M, et al. Retrospective analysis of risk factors for central nervous system metastases in operable breast cancer: effects of biologic subtype and Ki67 overexpression on survival. *Oncology.* 84:135-140 (2013).
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7. Margulis V, et al. Multi-institutional validation of the predictive value of Ki-67 labeling index in patients with urinary bladder cancer. *J. Natl. Cancer Inst.* 101:114-9 (2009).
8. Cuylen S, et al. Ki-67 acts as a biological surfactant to disperse mitotic chromosomes. *Nature.* 535:308-12 (2016).

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC	Mouse	IgG1	345kDa, 395kDa	Hu, not rodent



Western blot analysis of equal amounts of cell lysates using mouse mAb to Ki67, MCA-6G3, dilution 1:2,000, in green: [1] protein standard (red), [2] rapidly dividing HeLa cell cultures, [3] rapidly dividing HEK293 cell cultures. Strong double bands above 250kDa correspond to the two major Ki67 isoforms of apparent molecular weight of 345 and 395kDa. Smaller proteolytic fragments of these isoforms are also invariably detected on the blot.



Immunofluorescent analysis of HeLa cells stained with mouse mAb to Ki67, MCA-6G3, dilution 1:2,000 (red). The blue is DAPI staining of nuclear DNA. The MCA-6G3 antibody stains Ki67 protein predominantly expressed in the nucleoli of rapidly dividing cells, while nearby quiescent cells express little or no Ki67. The Ki67 protein also coats the surface of condensed chromosomes as seen at the middle left of the image.

Background:

The Ki67 protein was first discovered when researchers attempted to generate cancer cell specific monoclonal antibodies by injecting mice with nuclear preparations from Hodgkin's lymphoma cells (1). They obtained a monoclonal antibody which recognized two large proteins of apparent molecular weight 345kDa and 395kDa. The clone was named Ki67 after Kiel, Germany where the original work was done and the number of the 96 well plate in which the clone was found. The two proteins were found to be heavily expressed in proliferating cells, but to be absent in quiescent cells, and later work showed that they were the product of a single gene. The presence of the Ki67 protein is frequently used as an indicator of cell proliferation and its level of expression is one of the most reliable biomarkers of proliferative status of cancer cells (2-5). Much research shows a correlation between Ki67 protein level and prognosis in cancer patients, when high Ki67 levels being associated with poorer outcomes (e.g. 6,7). The original Ki67 antibody and several others have become so widely used that a search for "(Ki67 or Ki-67) and antibody" in PubMed in August 2018 produced over 5,600 results. Recent studies show that Ki67 functions as a "biological surfactant", which is essential for the fidelity of separation of condensed chromosomal DNA into the two daughter cells during cell division (8). This presumably explains the highly basic nature of Ki67, allowing a charge-based interaction with nucleic acids, the lack of this protein in non-dividing cells and the relative lack of protein sequence conservation.

The MCA-6G3 antibody was made against a recombinant construct including the N-terminal 300 amino acids of the human sequence P46013. This product is not recommended for use on rodent tissues: The Ki67 protein sequence is rather poorly conserved across species boundaries so antibodies raised against the human form, like this one, are often unreactive with the rodent form.

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Abbreviation Key:

mAb—Monoclonal Antibody pAb—Polyclonal Antibody WB—Western Blot IF—Immunofluorescence ICC—Immunocytochemistry IHC—Immunohistochemistry E—ELISA Hu—Human Mo—Monkey Do—Dog Rt—Rat Ms—Mouse Co—Cow Pi—Pig Ho—Horse Ch—Chicken Dr—D. rerio Dm—D. melanogaster Sm—S. mutans Ce—C. elegans Sc—S. cerevisiae Sa—S. aureus Ec—E. coli.