

MONOCLONAL ANTIBODY

# Anti-Rb (Human) mAb

Code No.	Clone	Subclass	Quantity	Concentration
MK-15-3	3H9	Mouse IgG2a $\kappa$	100 $\mu$ L	1 mg/mL

**BACKGROUND:** Mutation of the retinoblastoma tumor suppressor gene alone is sufficient to cause retinoblastoma in humans, suggesting that it might play a role in the normal coordination of cell proliferation and cell death. Deletion or mutational inactivation of the retinoblastoma tumor suppressor protein (Rb) is correlated with the genesis of a variety of human cancers including retinoblastoma, osteosarcoma, and carcinomas of the breast, bladder, and lung. Rb protein is phosphorylated by cyclin D-Cdk4/Cdk6 and cyclin A/cyclin E-Cdk2 during the G<sub>1</sub>/S transition. This phosphorylation causes the inactivation of the growth inhibitory functions of Rb. Rb undergo phosphorylation and attendant functional inactivation, the cell proceed into late G<sub>1</sub>.

**SOURCE:** This antibody was purified from hybridoma (clone 3H9) supernatant using protein A agarose. This hybridoma was established by fusion of mouse myeloma cell P3U1 with Balb/c mouse splenocyte immunized with the recombinant human Rb protein (612-928 aa).

**FORMULATION:** 100  $\mu$ g IgG in 100  $\mu$ L volume of PBS containing 50% glycerol, pH 7.2. No preservative is contained.

**STORAGE:** This antibody solution is stable for one year from the date of purchase when stored at -20°C.

**REACTIVITY:** This antibody reacts with human retinoblastoma gene product (110-115 kDa).

### APPLICATIONS:

Western blotting; 5-10  $\mu$ g/mL

Immunoprecipitation; 1-5  $\mu$ g/200-300  $\mu$ L of cell extract

Immunohistochemistry; 5  $\mu$ g/mL

Heat treatment is necessary for paraffin embedded sections.

Microwave oven; 2 times for 10 minutes each in 10 mM citrate buffer (pH 6.5)

Immunocytochemistry; Not tested

Flow cytometry; Not tested

Detailed procedure is provided in the following **PROTOCOLS**.

### SPECIES CROSS REACTIVITY:

Species	Human	Mouse	Rat
Cells	Jurkat, Raji, HL-60	WR19L	PC12
Reactivity on WB	+	-	-

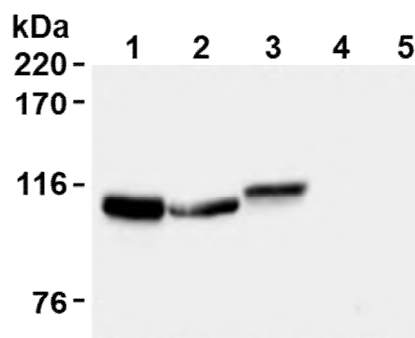
### INTENDED USE:

For Research Use Only. Not for use in diagnostic procedures.

### REFERENCES:

- 1) Haraguchi, T., *et al.*, *J. Cell Sci.* **120**, 1967-1977 (2007)
- 2) Tokugawa, T., *et al.*, *Cancer Res.* **62**, 4938-4944 (2002)
- 3) Nishio, M., *et al.*, *Clin. Cancer Res.* **3**, 1051-1058 (1997)
- 4) Lin, B. T., *et al.*, *EMBO J.* **10**, 857-864 (1991)
- 5) Wang, N. P., *et al.*, *Cell Growth Differ.* **1**, 233-239 (1990)
- 6) Taya, Y., *et al.*, *Biochem. Biophys. Res. Commun.* **164**, 580-586 (1989)
- 7) Lee, W. H., *et al.*, *Science* **235**, 1394-1399 (1987)
- 8) Lalande, M., *et al.*, *Cancer Genet. Cytogenet.* **13**, 283-295 (1984)

Clone 3H9 is used in reference number 1) - 3).



**Western blotting analysis of Rb expression in Jurkat (1), Raji (2), HL-60 (3), WR19L (4) and PC12 (5) using MK-15-3.**

### PROTOCOLS:

#### SDS-PAGE & Western blotting

- 1) Wash the cells 3 times with PBS and suspend with 10 volume of cold Lysis buffer (50 mM Tris-HCl, pH 7.2, 250 mM NaCl, 0.1% NP-40, 2 mM EDTA, 10% glycerol) containing appropriate protease inhibitors. Incubate it at 4°C with rotating for 30 minutes, then sonicate briefly (up to 10 seconds).

- 2) Centrifuge the tube at 12,000 x g for 10 minutes at 4°C and transfer the supernatant to another tube. Measure the protein concentration of the supernatant and add the cold Lysis buffer to make 8 mg/mL solution.
- 3) Mix the sample with equal volume of Laemmli's sample buffer.
- 4) Boil the samples for 3 minutes and centrifuge. Load 10 µL of the sample per lane in a 1 mm thick SDS-polyacrylamide gel for electrophoresis.
- 5) Blot the protein to a polyvinylidene difluoride (PVDF) membrane at 1 mA/cm<sup>2</sup> for 1 hour in a semi-dry transfer system (Transfer Buffer: 25 mM Tris, 190 mM glycine, 20% Methanol). See the manufacture's manual for precise transfer procedure.
- 6) To reduce nonspecific binding, soak the membrane in 10% skimmed milk (in PBS, pH 7.2) for 1 hour at room temperature, or overnight at 4°C.
- 7) Incubate the membrane with primary antibody diluted with 1% skimmed milk (in PBS, pH 7.2) as suggested in the **APPLICATIONS** for 1 hour at room temperature. (The concentration of antibody will depend on condition.)
- 8) Wash the membrane with PBS-T [0.05% Tween-20 in PBS] (5 minutes x 3 times).
- 9) Incubate the membrane with the 1:10,000 HRP-conjugated anti-mouse IgG (MBL; code no. 330) diluted with 1% skimmed milk (in PBS, pH 7.2) for 1 hour at room temperature.
- 10) Wash the membrane with PBS-T (10 minutes x 3 times).
- 11) Wipe excess buffer on the membrane, then incubate it with appropriate chemiluminescence reagent for 1 minute.
- 12) Remove extra reagent from the membrane by dabbing with paper towel, and seal it in plastic wrap.
- 13) Expose to an X-ray film in a dark room for 3 minutes.
- 14) Develop the film as usual. The condition for exposure and development may vary.

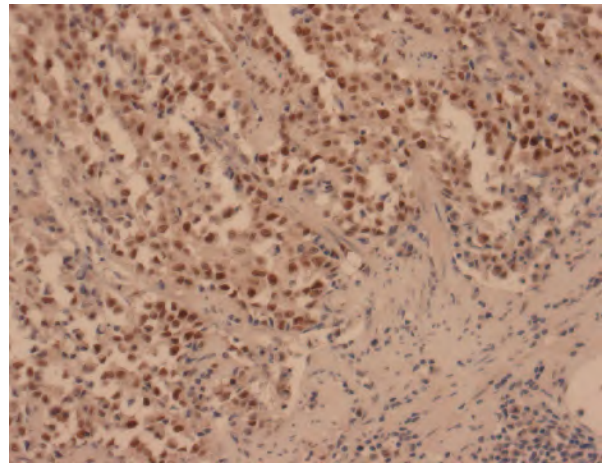
(Positive controls for Western blotting; Jurkat, Raji, HL-60)

### **Immunoprecipitation**

- 1) Wash the cells 3 times with PBS and suspend with 10 volume of cold Lysis buffer (50 mM Tris-HCl pH 7.2, 250 mM NaCl, 0.1% NP-40, 2 mM EDTA, 10% glycerol) containing appropriate protease inhibitors. Incubate it at 4°C with rotating for 30 minutes, then sonicate briefly (up to 10 seconds).
- 2) Centrifuge the tube at 12,000 x g for 10 minutes at 4°C and transfer the supernatant to another tube.
- 3) Add primary antibody as suggested in the **APPLICATIONS** into 300 µL of the supernatant. Mix well and incubate with gentle agitation for 30-120 minutes at 4°C.
- 4) Add 20 µL of 50% protein A agarose beads resuspended in the cold Lysis buffer. Mix well and incubate with gentle agitation for 60 minutes at 4°C.
- 5) Centrifuge the tube at 2,500 x g for 10 seconds, and carefully discard the supernatant using a pipettor without

disturbing the beads.

- 6) Resuspend the beads with cold Lysis buffer.
- 7) Centrifuge the tube at 2,500 x g for 10 seconds, and carefully discard the supernatant.
- 8) Repeat steps 6)-7) 3-5 times
- 9) Resuspend the beads in 20 µL of Laemmli's sample buffer, boil for 3-5 minutes, and centrifuge for 5 minutes. Use 10 µL/lane for the SDS-PAGE analysis. (See **SDS-PAGE & Western blotting**.)



***Immunohistochemical detection of Rb on human stomach paraffin embedded section with MK-15-3.***

### **Immunohistochemical staining for paraffin-embedded sections: SAB method**

- 1) Deparaffinize the sections with Xylene 3 times for 3-5 minutes each.
- 2) Wash the slides with Ethanol 3 times for 3-5 minutes each.
- 3) Wash the slides with PBS 3 times for 3-5 minutes each.
- 4) Heat treatment  
Heat treatment by Microwave:  
Place the slides put on staining basket in 500 mL beaker with 500 mL of 10 mM citrate buffer (pH 6.5). Cover the beaker with plastic wrap, then process the slides 2 times for 10 minutes each at 500 W with microwave oven. Let the slides cool down in the beaker at room temperature for about 40 minutes.
- 5) Remove the slides from the citrate buffer and cover each section with 3% H<sub>2</sub>O<sub>2</sub> for 10 minutes at room temperature to block endogenous peroxidase activity. Wash 3 times in PBS for 5 minutes each.
- 6) Remove the slides from PBS, wipe gently around each section and cover tissues with blocking buffer (20 mM HEPES, 1% BSA, 135 mM NaCl) for 5 minutes to block non-specific staining. Do not wash.
- 7) Tip off the blocking buffer, wipe gently around each section and cover tissues with primary antibody diluted with PBS containing 1% BSA as suggested in the **APPLICATIONS**.
- 8) Incubate the sections for 1 hour at room temperature.
- 9) Wash the slides 3 times in PBS for 5 minutes each.

- 10) Wipe gently around each section and cover tissues with Histostar™ (Ms + Rb) for Human tissue (MBL; code no. 8460). Incubate for 30 minutes at room temperature. Wash as in step 9).
- 11) Visualize by reacting for 5-20 minutes with Histostar™ DAB Substrate Solution (MBL; code no. 8469). \*DAB is a suspect carcinogen and must be handled with care. Always wear gloves.
- 12) Wash the slides in water for 5 minutes.
- 13) Counter stain in hematoxylin for 1 minute, wash the slides 3 times in water for 5 minutes each, and then immerse the slides in PBS for 5 minutes. Dehydrate by immersing in Ethanol 3 times for 3 minutes each, followed by immersing in Xylene 3 times for 3 minutes each.
- 14) Now ready for mounting.

(Positive controls for Immunohistochemistry; human stomach)

**RELATED PRODUCTS:**

Please visit website at <http://ruo.mbl.co.jp/>.