

# Anti-HA-tag mAb

<b>CODE No.</b>	M180-3
<b>CLONALITY</b>	Monoclonal
<b>CLONE</b>	TANA2
<b>ISOTYPE</b>	Mouse IgG2b $\kappa$
<b>QUANTITY</b>	200 $\mu$ L, 1 mg/mL
<b>SOURCE</b>	Purified IgG from hybridoma supernatant
<b>IMMUNOGEN</b>	KLH conjugated synthetic peptide, YPYDVPDYA (HA-tag)
<b>REACTIVITY</b>	This antibody reacts with N-terminal and C-terminal HA-tagged proteins.
<b>FORMULATION</b>	PBS containing 50% Glycerol (pH 7.2). No preservative is contained.
<b>STORAGE</b>	This antibody solution is stable for one year from the date of purchase when stored at $-20^{\circ}\text{C}$ .

## APPLICATIONS-CONFIRMED

<u>Western blotting</u>	0.1 $\mu\text{g/mL}$
<u>Immunoprecipitation</u>	2 $\mu\text{g}/300 \mu\text{L}$ of cell extract from $3 \times 10^6$ cells
<u>Immunocytochemistry</u>	1 $\mu\text{g/mL}$
<u>Flow cytometry</u>	1 $\mu\text{g/mL}$

## APPLICATION-REORTED

<u>RNP Immunoprecipitation (RIP)</u>	Reference 14)
--------------------------------------	---------------

## REFERENCES

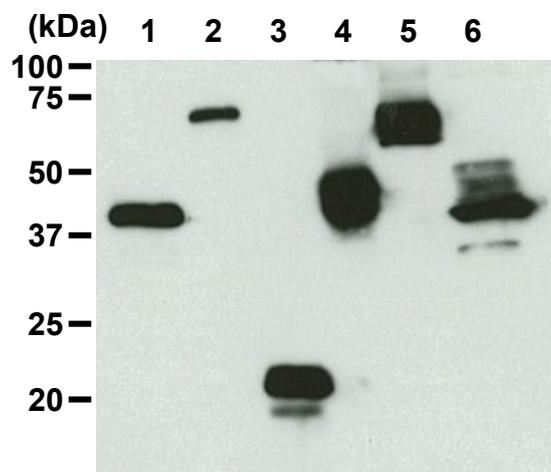
- 1) Cui, C. P., *et al.*, *Nat. Commun.* **9**, 4648 (2018) [WB]
- 2) Chen, Y., *et al.*, *Nat. Commun.* **9**, 2464 (2018) [WB]
- 3) Nellaepalli, S., *et al.*, *Nat. Commun.* **9**, 2439 (2018) [WB]
- 4) Li, Z., *et al.*, *Cell Res.* **28**, 756-770 (2018) [WB]
- 5) Tu, R., *et al.*, *Cell Death Dis.* **9**, 553 (2018) [WB, IP]
- 6) Deng, T., *et al.*, *PNAS.* **115**, 4678-4683 (2018) [WB, IP]
- 7) Lin, C. C., *et al.*, *Sci. Rep.* **8**, 2743 (2018) [WB, IP, IC]
- 8) Zhang, P., *et al.*, *Nat. Med.* **24**, 84-94 (2018) [WB, IP, IC]
- 9) Huang, Y., *et al.*, *Oncotarget* **8**, 83075-83087 (2017) [WB, IP]
- 10) Hu, L., *et al.*, *Plant Cell* **29**, 3157-3185 (2017) [WB]
- 11) Wang, S., *et al.*, *Cell Death Dis.* **8**, e3058 (2017) [WB]
- 12) Song, K. H., *et al.*, *Cell Death Dis.* **8**, e2536 (2017) [WB, IP]
- 13) Iimori, M., *et al.*, *Nat. Commun.* **7**, 11117 (2016) [WB]
- 14) Zhong, E., *et al.*, *Nucleic Acids Res.* **43**, 10474-10491 (2015) [RIP, Co-IP]
- 15) Yamano, K., *et al.*, *J. Biol. Chem.* **290**, 25199-15211 (2015) [WB]
- 16) Okatsu, K., *et al.*, *J. Cell Biol.* **209**, 111-128 (2015) [WB]
- 17) Iguchi, M., *et al.*, *J. Biol. Chem.* **288**, 22019-22032 (2013) [WB]
- 18) Tamura, Y., *et al.*, *Cell Metab.* **17**, 709-718 (2013) [WB]

For more information, please visit our web site <https://ruo.mbl.co.jp/>.

The descriptions of the following protocols are examples. Each user should determine the appropriate condition.

### **SDS-PAGE & Western blotting**

- 1) Wash  $1 \times 10^6$  cells 3 times with PBS and suspends them in 1 mL of Laemmli's sample buffer, then sonicate briefly (up to 10 sec.).
- 2) Boil the samples for 3 min. and centrifuge. Load 10  $\mu$ L of the sample per lane in a 1-mm-thick SDS-polyacrylamide gel (12.5% acrylamide) for electrophoresis.
- 3) Blot the protein to a polyvinylidene difluoride (PVDF) membrane at 1 mA/cm<sup>2</sup> for 1 hr. in a semi-dry transfer system (Transfer Buffer: 25 mM Tris, 190 mM glycine, 20% methanol). See the manufacturer's manual for precise transfer procedure.
- 4) To reduce nonspecific binding, soak the membrane in 10% skimmed milk (in PBS, pH 7.2) overnight at 4°C.
- 5) Wash the membrane with PBS-T [0.05% Tween-20 in PBS] (5 minutes x 3).
- 6) Incubate the membrane with primary antibody diluted with 1% skimmed milk (in PBS, pH 7.2) as suggested in the **APPLICATIONS** for 1 hr. at room temperature. (The concentration of antibody will depend on the conditions.)
- 7) Wash the membrane with PBS-T (5 min. x 3).
- 8) Incubate the membrane with 1:10,000 of Anti-IgG (Mouse) pAb-HRP (MBL, code no. 330) diluted with 1% skimmed milk (in PBS, pH 7.2) for 1 hr. at room temperature.
- 9) Wash the membrane with PBS-T (5 min. x 3).
- 10) Wipe excess buffer on the membrane, and then incubate it with appropriate chemiluminescence reagent for 1 min. Remove extra reagent from the membrane by dabbing with paper towel, and seal it in plastic wrap.
- 11) Expose to an X-ray film in a dark room for 30 sec. Develop the film as usual. The condition for exposure and development may vary.



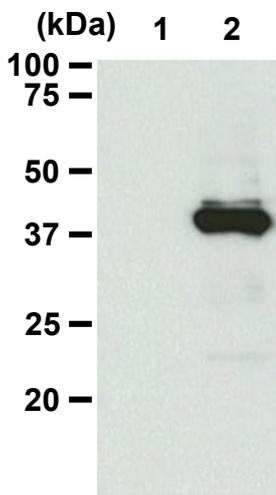
#### ***Western blot analysis of HA-tagged protein***

- Lane 1: N-terminal Met-HA-tagged protein A/293T
- Lane 2: N-terminal Met-HA-tagged protein B/293T
- Lane 3: N-terminal Met-HA-tagged protein C/293T
- Lane 4: N-terminal HA-tagged protein D/293T
- Lane 5: N-terminal HA-tagged protein E/293T
- Lane 6: C-terminal HA-tagged protein F/293T

Immunoblotted with Anti-HA-tag mAb (MBL, code no. M180-3)

### **Immunoprecipitation**

- 1) Wash  $1 \times 10^7$  cells 2 times with PBS and resuspend them with 1 mL of ice-cold Lysis buffer [50 mM Tris-HCl (pH 7.5), 150 mM NaCl, 0.05% NP-40] containing appropriate protease inhibitors, then sonicate briefly (up to 20 sec.).
- 2) Centrifuge the tube at 12,000 x g for 5 min. at 4°C and transfer the supernatant to another tube.
- 3) Mix 20  $\mu$ L of 50% protein A agarose beads slurry resuspended in 300  $\mu$ L of IP buffer [10 mM Tris-HCl (pH 8.0), 500 mM NaCl, 0.1% NP-40] with primary antibody as suggested in the **APPLICATIONS**. Incubate with gentle agitation for 1 hr. at room temperature.
- 4) Wash the beads 3 times with 1 mL of IP buffer.
- 5) Add 300  $\mu$ L of cell lysate (prepared sample of step 2), then incubate with gentle agitation for 1 hr. at room temperature.
- 6) Wash the beads 5 times with 1 mL of Lysis buffer.
- 7) Resuspend the beads in 20  $\mu$ L of Laemmli's sample buffer, boil for 2 min. and centrifuge.
- 8) Load 10  $\mu$ L of the sample per lane in a 1-mm-thick SDS-polyacrylamide gel (12.5% acrylamide) for electrophoresis.
- 9) Blot the protein to a polyvinylidene difluoride (PVDF) membrane at 1 mA/cm<sup>2</sup> for 1 hr. in a semi-dry transfer system (Transfer Buffer: 25 mM Tris, 190 mM glycine, 20% methanol). See the manufacturer's manual for precise transfer procedure.
- 10) To reduce nonspecific binding, soak the membrane in 10% skimmed milk (in PBS, pH 7.2) overnight at 4°C.
- 11) Incubate the membrane with 1:1,000 of Anti-HA-tag pAb-HRP-Direct (MBL, code no. 561-7) diluted with 1% skimmed milk (in PBS, pH 7.2) for 1 hr. at room temperature. (The concentration of antibody will depend on the conditions.)
- 12) Wash the membrane with PBS-T [0.05% Tween-20 in PBS] (5 min. x 3).
- 13) Wipe excess buffer on the membrane, and then incubate it with appropriate chemiluminescence reagent for 1 min.
- 14) Remove extra reagent from the membrane by dabbing with paper towel, and seal it in plastic wrap.
- 15) Expose to an X-ray film in a dark room for 30 sec. Develop the film as usual. The condition for exposure and development may vary.



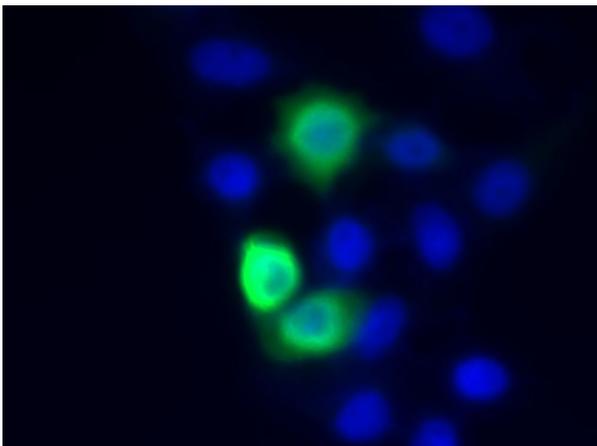
#### ***Immunoprecipitation of HA-tagged I $\kappa$ B $\alpha$***

Lane 1: Mouse IgG2b (isotype control) (MBL, code no. M077-3)  
Lane 2: Anti-HA-tag mAb (MBL, code no. M180-3)

Immunoblotted with Anti-HA-tag pAb-HRP-Direct (MBL, code no. 561-7)

### **Immunocytochemistry**

- 1) Spread the cells in the nutrient condition on a glass slide, then incubate in a CO<sub>2</sub> incubator for one night.
- 2) Remove the culture supernatant by careful aspiration.
- 3) Fix the cells by immersing the slide in 4% paraformaldehyde (PFA)/PBS for 10 min. at room temperature (20~25°C).
- 4) Prepare a wash container such as a 500 mL beaker with a magnetic stirrer. Then wash the fixed cells on the glass slide by soaking the slide with a plenty of PBS in the wash container for 5 minutes. Take care not to touch the cells. Repeat another wash once more.
- 5) Immerse the slide in 0.2% Triton X-100/PBS for 10 min. at room temperature.
- 6) Wash the slide in a plenty of PBS as in the step 4).
- 7) Add 200 µL of the primary antibody diluted with 2% fetal calf serum (FCS)/PBS as suggested in the **APPLICATIONS** onto the cells and incubate for 1 hr. at room temperature. (Optimization of antibody concentration or incubation condition is recommended if necessary.)
- 8) Wash the slide in a plenty of PBS as in the step 4).
- 9) Add 100 µL of 1:500 Alexa Fluor®488 conjugated anti-mouse IgG (Thermo Fisher Scientific, code no. A11001) diluted with PBS onto the cells. Incubate for 30 min. at room temperature. Keep out light by aluminum foil.
- 10) Wash the slide in a plenty of PBS as in the step 4).
- 11) Wipe excess liquid from slide but take care not to touch the cells. Never leave the cells to dry.
- 12) Counterstain with DAPI for 5 min. at room temperature.
- 13) Wash the slide in a plenty of PBS as in the step 4).
- 14) Promptly add mounting medium onto the slide, then put a cover slip on it.



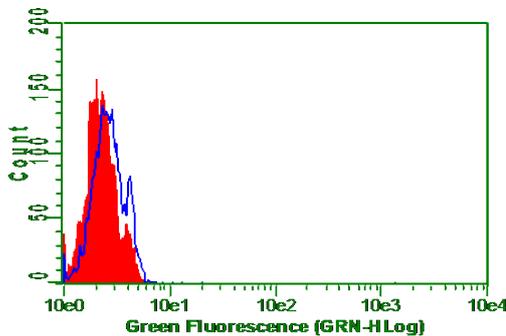
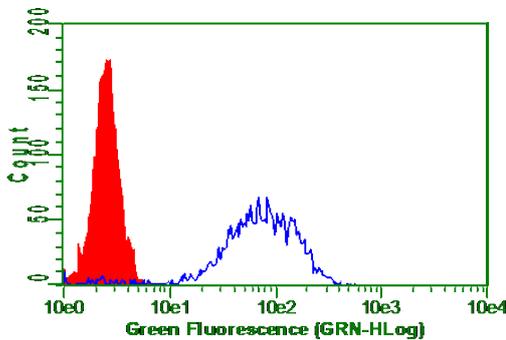
### ***Immunocytochemical detection of HA-tagged IκBα in HeLa***

Green: Anti-HA-tag mAb (MBL, code no. M180-3)

Blue: DAPI

**Flow cytometric analysis for adherent cells**

- 1) Detach the cells from culture dish.
- 2) Wash the cells 3 times with 1 mL of washing buffer [PBS containing 2% fetal calf serum (FCS)].
- 3) Add 200 µL of 4% paraformaldehyde (PFA) to the cell pellet after tapping. Mix well, then fix the cells for 10 min. at room temperature.
- 4) Wash the cells 2 times with 1 mL of washing buffer.
- 5) Add 200 µL of PBS containing 0.2% Triton X-100 to the cell pellet after tapping. Mix well, then permeabilize the cells for 10 min. at room temperature.
- 6) Wash the cells 1 time with 1 mL of washing buffer.
- 7) Resuspend the cells with washing buffer ( $5 \times 10^6$  cells/mL).
- 8) Add 100 µL of the cell suspension into each tube, and centrifuge at 500 x g for 1 min. at room temperature (20~25°C). Remove supernatant by careful aspiration.
- 9) Add 20 µL of Clear Back (Human Fc receptor blocking reagent, MBL, code no. MTG-001) to the cell pellet after tapping. Mix well and incubate for 5 min. at room temperature.
- 10) Add 40 µL of the primary antibody at the concentration as suggested in the **APPLICATIONS** diluted in the washing buffer. Mix well and incubate for 30 min. at room temperature.
- 11) Add 1 mL of washing buffer followed by centrifugation at 500 x g for 1 min. at room temperature. Remove supernatant by careful aspiration. Repeat another wash once more.
- 12) Add 40 µL of 1:500 Alexa Fluor®488 conjugated anti-mouse IgG (Thermo Fisher Scientific, code no. A11001) diluted with washing buffer. Mix well and incubate for 30 min. at room temperature.
- 13) Add 1 mL of washing buffer followed by centrifugation at 500 x g for 1 min. at room temperature. Remove supernatant by careful aspiration.
- 14) Resuspend the cells with 500 µL of washing buffer and analyze by a flow cytometer.



***Flow cytometric detection of HA-tagged protein in HeLa***

Open: Anti-HA-tag mAb (MBL, code no. M180-3)  
Closed: Mouse IgG2b (isotype control) (MBL, code no. M077-3)

Upper: HA-tagged protein in HeLa  
Lower: Parental cell (HeLa)