

MONOCLONAL ANTIBODY

# Anti- GFP (Green Fluorescent Protein) mAb

Code No.	Clone	Subclass	Quantity	Concentration
M048-3	1E4	Mouse IgG2b	100 $\mu$ L	1 mg/mL

**BACKGROUND:** Green Fluorescent Protein (GFP) tagging provide an excellent means for monitoring gene expression and protein localization in living cells, so that it is widely accepted by molecular and cell biological research. Monoclonal anti-GFP antibody can detect GFP and its variants on Western blotting, Immunoprecipitation and Immunocytochemistry.

**SOURCE:** This antibody was purified from hybridoma (clone 1E4) supernatant using protein A agarose. This hybridoma was established by fusion of mouse myeloma cell P3U1 with Balb/c mouse splenocyte immunized with recombinant full length GFP protein (246 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 GFP on Western blotting, Immunoprecipitation and Immunocytochemistry. It reacts with EBFP, SEBFP, ECFP, SECFP, EGFP, SEGFP cpSEGFP, EYFP, Venus, cpVenus, R-pericam, and Sapphire.

## APPLICATIONS:

Western blotting: 1  $\mu$ g/mL for chemiluminescence detection system

Immunoprecipitation: 5  $\mu$ g/Sample

Immunohistochemistry: 10  $\mu$ g/mL

Immunocytochemistry: 2  $\mu$ g/mL

Flow cytometry: Not tested

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

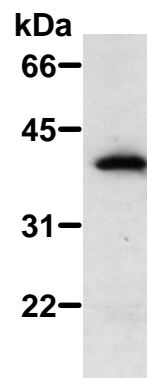
## INTENDED USE:

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

## REFERENCES:

- 1) Shainer, I., *et al.*, *Sci. Rep.* **7**, 44777 (2017) [IHC]
- 2) Katsushima, K., *et al.*, *Nat. Commun.* **7**, 13616 (2016) [IHC]
- 3) Sun, J., *et al.*, *Nat. Commun.* **6**, 88566 (2015) [IF]
- 4) Sugawara, T., *et al.*, *J. Neurosci.* **33**, 12186-12196 (2013) [IHC]
- 5) Asada, N. and Sanada, K., *J. Neurosci.* **30**, 8852-8865 (2010) [IP]

- 6) Banerjee, S., *et al.*, *Neuron* **64**, 871-884 (2009) [IP, IC]
- 7) Komuro, A., *et al.*, *J. Natl. Cancer Inst.* **101**, 592-604 (2009) [WB]
- 8) Takeda, K., *et al.*, *J. Biol. Chem.* **282**, 7522-7531 (2007) [WB]
- 9) Reversi, A., *et al.*, *Am. J. Physiol. Regul. Integr. Comp. Physiol.* **291**, R861-R869 (2006) [WB]
- 10) Hanamoto, T., *et al.*, *J. Biol. Chem.* **280**, 16665-16675 (2005) [WB]
- 11) Kontogianni-Konstantopoulos, A., *et al.*, *Am. J. Physiol. Cell Physiol.* **287**, C209-C217 (2004) [WB]
- 12) Broday, L., *et al.*, *J. Cell Biol.* **165**, 857-867 (2004) [IHC]
- 13) Hisatsune, C., *et al.*, *J. Biol. Chem.* **279**, 18887-18894 (2004) [WB]
- 14) Pottekat, A. and Menon, A. K., *J. Biol. Chem.* **279**, 15743-15751 (2004) [WB]
- 15) Lozupone, F., *et al.*, *J. Biol. Chem.* **279**, 9199-9207 (2004) [WB, IP]
- 16) Iwai, S., *et al.*, *J. Biol. Chem.* **279**, 4696-4704 (2004) [WB]
- 17) de Graaf, K., *et al.*, *J. Biol. Chem.* **279**, 4612-4624 (2004) [WB, IP]
- 18) Song, Z., *et al.*, *J. Biol. Chem.* **278**, 23130-23140 (2003) [WB]
- 19) Nakamichi, I., *et al.*, *Mol. Biol. Cell* **13**, 3441-3451 (2002) [WB]
- 20) Ozoe, F., *et al.*, *Mol. Cell Biol.* **22**, 7105-7119 (2002) [IP]
- 21) Ko, H. S., *et al.*, *J. Biol. Chem.* **277**, 35386-35392 (2002) [IC]
- 22) Masuda, M., *et al.*, *J. Biol. Chem.* **277**, 31014-31019 (2002) [WB]



## Western blot analysis of GFP

Sample: GFP fusion protein transfectant

## PROTOCOLS:

### SDS-PAGE & Western Blotting

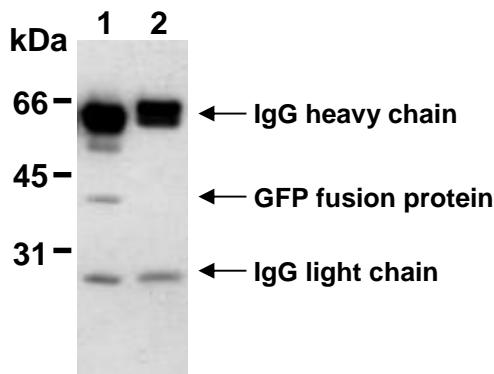
- 1) Boil the samples for 2 minutes and centrifuge. Load 10  $\mu$ L of sample per lane on a 1-mm-thick SDS-polyacrylamide gel and carry out electrophoresis.
- 2) Blot the protein to a polyvinylidene difluoride (PVDF) membrane at 1 mA/cm<sup>2</sup> for 1 hour in a semi-dry transfer system. (Transfer Buffer: 25 mM Tris, 190 mM glycine, 20% MeOH). See the manufacturer's manual for precise transfer procedure.
- 3) 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.

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- 4) Incubate the membrane with primary antibody diluted with PBS, pH 7.2 containing 1% skimmed milk as suggested in the **APPLICATIONS** for 1 hour at room temperature.
- 5) Wash the membrane with PBS-T [0.05% Tween-20 in PBS] (5 minutes x 6 times).
- 6) 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 hour at room temperature.
- 7) Wash the membrane with PBS-T (5 minutes x 6 times).
- 8) Wipe excess buffer off the membrane, and incubate membrane with an appropriate chemiluminescence reagent for 1 minute.
- 9) Remove extra reagent from the membrane by dabbing with a paper towel, and seal it in plastic wrap.
- 10) Expose the membrane onto an X-ray film in a dark room for 1 minute.
- 11) Develop the film under usual settings. The conditions for exposure and development may vary.

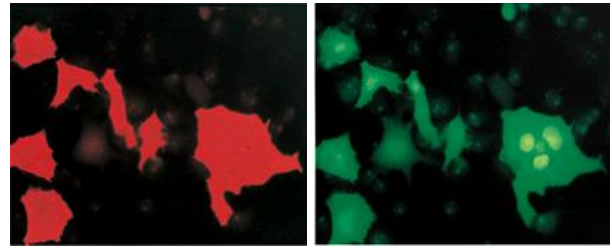


### **Immunoprecipitation of GFP from transfectant**

Lane 1: IP with M048-3  
Lane 2: IP with isotype control (M077-3)

### **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 fresh tube.
- 3) Add the antibody at the amount as suggested in the **APPLICATIONS** to the supernatant containing approximately 300  $\mu$ L total protein. Mix well and incubate with gentle agitation for 30-120 minutes at 4°C.
- 4) Add 20  $\mu$ L 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) Wash the beads 3-5 times with the cold Lysis buffer (centrifuge the tube at 2,500 x g for 10 seconds).
- 6) Resuspend the beads in 20  $\mu$ L of Laemmli's sample buffer, boil for 3-5 minutes, and centrifuge for 5 minutes. Use 10  $\mu$ L/lane for the SDS-PAGE analysis. (See **SDS-PAGE & Western blotting**.)



**Immunocytochemical detection of GFP on 4% PFA fixed transfectant using M048-3 (left). Right panel is GFP own fluorescence.**

### **Immunocytochemistry**

#### **Fixing:**

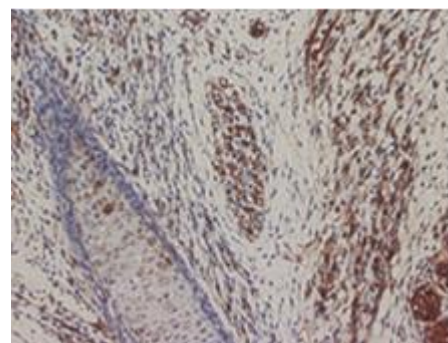
- 1) Rinse the cells on glass coverslips in PBS, and immerse for 15 minutes in PBS containing 4% paraformaldehyde. Then rinse the coverslips 2 times for 5 minutes each in PBS.

#### **Blocking:**

- 1) Cover the cells with 3% H<sub>2</sub>O<sub>2</sub> in PBS for 10 minutes at room temperature. Then rinse the coverslips 2 times for 5 minutes each in PBS.
- 2) Cover the cells with 10% normal goat serum (NGS) in PBS or Clear Back (human FcR blocking reagent, MBL code no. MTG-001) for 15 minutes to minimize non-specific adsorption of the antibodies to the cover slip (25-50  $\mu$ L is usually sufficient).

#### **Staining:**

- 1) Remove the blocking buffer.
- 2) Incubate in primary antibody at the concentration suggested in **APPLICATIONS** diluted in 1% NGS in PBS for 1 hour at room temperature. (The concentration of antibody will depend on several variables and the abundance of the antigen.)
- 3) Wash the cells 3 times in PBS for 5 minutes each.
- 4) Incubate in Rhodamine-conjugated anti-mouse IgG antibody diluted in PBS for 1 hour at room temperature.
- 5) Wash the cells in PBS for 15 minutes.
- 6) Mounting and microscopic analysis.

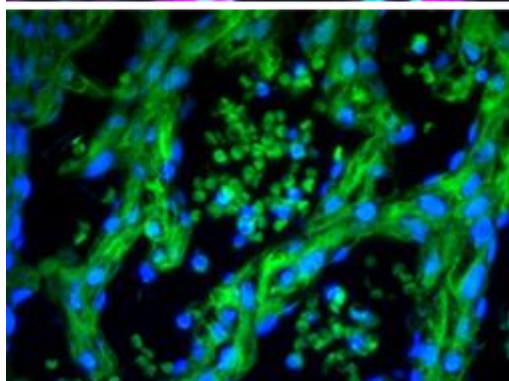
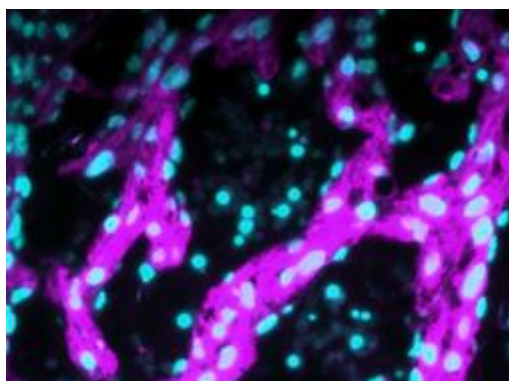


**Immunohistochemical detection of GFP on paraffin embedded section of GFP transgenic mouse with M048-3.**

### **Immunohistochemical staining for paraffin-embedded sections (DAB visualization)**

- 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) Remove the slides from the PBS 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.
- 5) 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.
- 6) Tip off the blocking buffer, wipe gently around each section and cover tissues with primary antibody diluted with blocking buffer as suggested in the **APPLICATIONS**.
- 7) Incubate the sections for 1 hour at room temperature.
- 8) Wash the slides 3 times in PBS for 5 minutes each.
- 9) Wipe gently around each section and cover tissues with ENVISION+Dual Link (DAKO; code no. K4063). Incubate for 1 hour at room temperature. Wash as in step 8).
- 10) Visualize by reacting for 10 minutes with DAB substrate solution (DAKO; code no. K3465). \*DAB is a suspect carcinogen and must be handled with care. Always wear gloves.
- 11) Wash the slides in water for 5 minutes.
- 12) 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.
- 13) Now ready for mounting.



**Immunohistochemical detection of GFP on paraffin embedded section of GFP transgenic mouse.**

Magenta: M048-3  
 Green: GFP own fluorescence  
 Cyan, Blue: DAPI

**Immunohistochemical staining for paraffin-embedded sections (Visualization using Fluorochrome conjugated secondary antibody)**

- 1) Refer to 1) – 3) of **Immunohistochemical staining for paraffin-embedded section (DAB visualization)**.
- 2) 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.
- 3) Tip off the blocking buffer, wipe gently around each section and cover tissues with primary antibody diluted with blocking buffer as suggested in the **APPLICATIONS**.
- 4) Incubate the sections for 1 hour at room temperature.
- 5) Wash the slides 3 times in PBS for 5 minutes each.
- 6) Incubate in Alexa-Fluor<sup>®</sup> 647-conjugated anti-mouse IgG (Invitrogen; code no. A21237) diluted 1:200 in PBS for 1 hour at room temperature.
- 7) Wash the slides 3 times in PBS for 5 minutes each.
- 8) Counter stain with DAPI for 2 minutes at room temperature.
- 9) Wash the slides 2 times in PBS.
- 10) Now ready for mounting.

**RELATED PRODUCTS**

Antibodies

- |          |   |
|----------|---|
| M048-3   | Anti-GFP mAb (1E4)                                      |
| D153-3   | Anti-GFP mAb (RQ2)                                      |
| D153-6   | Anti-GFP mAb-Biotin (RQ2)                               |
| D153-8   | Anti-GFP mAb-Agarose (RQ2)                              |
| D153-A48 | Anti-GFP mAb-Alexa Fluor <sup>®</sup> 488 (RQ2)         |
| D153-A59 | Anti-GFP mAb-Alexa Fluor <sup>®</sup> 594 (RQ2)         |
| D153-A64 | Anti-GFP mAb-Alexa Fluor <sup>®</sup> 647 (RQ2)         |
| 598      | Anti-GFP pAb (polyclonal)                               |
| 598-7    | Anti-GFP pAb-HRP-Direct (polyclonal)                    |
| PM073    | Anti-Renilla GFP pAb (polyclonal)                       |
| M155-3   | Anti-RFP mAb (8D6)                                      |
| M165-3   | Anti-RFP mAb (3G5)                                      |
| M165-8   | Anti-RFP mAb-Agarose (3G5)                              |
| M204-3   | Anti-RFP mAb (1G9)                                      |
| M204-7   | Anti-RFP mAb-HRP-Direct (1G9)                           |
| M208-3   | Anti-RFP mAb Cocktail (1G9, 3G5)                        |
| PM005    | Anti-RFP pAb (polyclonal)                               |
| PM005-7  | Anti-RFP pAb-HRP-Direct (polyclonal)                    |
| M180-3   | Anti-HA-tag mAb (TANA2) (200 µL)                        |
| M180-6   | Anti-HA-tag mAb-Biotin (TANA2)                          |
| M180-7   | Anti-HA-tag mAb-HRP-Direct (TANA2)                      |
| M180-A48 | Anti-HA-tag mAb-Alexa Fluor <sup>®</sup> 488 (TANA2)    |
| M180-A59 | Anti-HA-tag mAb-Alexa Fluor <sup>®</sup> 594 (TANA2)    |
| M180-A64 | Anti-HA-tag mAb-Alexa Fluor <sup>®</sup> 647 (TANA2)    |
| 561      | Anti-HA-tag pAb (polyclonal) (0.1 mL)                   |
| 561-7    | Anti-HA-tag pAb-HRP-Direct (polyclonal)                 |
| 561-8    | Anti-HA-tag pAb-Agarose (polyclonal)                    |
| M132-3   | Anti-HA-tag mAb (5D8)                                   |
| M185-3L  | Anti-DDDDK-tag mAb (FLA-1) (1 mL)                       |
| M185-6   | Anti-DDDDK-tag mAb-Biotin (FLA-1)                       |
| M185-7   | Anti-DDDDK-tag mAb-HRP-Direct (FLA-1)                   |
| M185-A48 | Anti-DDDDK-tag mAb-Alexa Fluor <sup>®</sup> 488 (FLA-1) |
| M185-A59 | Anti-DDDDK-tag mAb-Alexa Fluor <sup>®</sup> 594 (FLA-1) |
| M185-A64 | Anti-DDDDK-tag mAb-Alexa Fluor <sup>®</sup> 647 (FLA-1) |



PM020 Anti-DDDDK-tag pAb (polyclonal)  
PM020-7 Anti-DDDDK-tag pAb-HRP-Direct (polyclonal)  
PM020-8 Anti-DDDDK-tag pAb-Agarose (polyclonal)  
M192-3 Anti-Myc-tag mAb (My3) (200  $\mu$ L)  
M192-6 Anti-Myc-tag mAb-Biotin (My3)  
M047-3 Anti-Myc-tag mAb (PL14)  
M047-7 Anti-Myc-tag mAb-HRP-Direct (PL14)  
M047-8 Anti-Myc-tag mAb-Agarose (PL14)  
M047-A48 Anti-Myc-tag mAb-Alexa Fluor<sup>®</sup> 488 (PL14)  
M047-A59 Anti-Myc-tag mAb-Alexa Fluor<sup>®</sup> 594 (PL14)  
M047-A64 Anti-Myc-tag mAb-Alexa Fluor<sup>®</sup> 647 (PL14)  
562 Anti-Myc-tag pAb (polyclonal) (0.1 mL)  
D291-3 Anti-His-tag mAb (OGHis) (200  $\mu$ L)  
D291-6 Anti-His-tag mAb-Biotin (OGHis)  
D291-7 Anti-His-tag mAb-HRP-Direct (OGHis)  
D291-8 Anti-His-tag mAb-Agarose (OGHis)  
D291-A48 Anti-His-tag mAb-Alexa Fluor<sup>®</sup> 488 (OGHis)  
D291-A59 Anti-His-tag mAb-Alexa Fluor<sup>®</sup> 594 (OGHis)  
D291-A64 Anti-His-tag mAb-Alexa Fluor<sup>®</sup> 647 (OGHis)  
M089-3 Anti-His-tag mAb (6C4)  
M136-3 Anti-His-tag mAb (2D8)  
PM032 Anti-His-tag pAb (polyclonal)  
PM032-8 Anti-His-tag pAb-Agarose (polyclonal)  
M167-3 Anti-V5-tag mAb (1H6)  
M215-3 Anti-V5-tag mAb (OZA3)  
M215-6 Anti-V5-tag mAb-Biotin (OZA3)  
M215-7 Anti-V5-tag mAb-HRP-Direct (OZA3)  
PM003 Anti-V5-tag pAb (polyclonal)  
PM003-7 Anti-V5-tag pAb-HRP-Direct (polyclonal)  
PM003-8 Anti-V5-tag pAb-Agarose (polyclonal)  
PM021 Anti-S-tag pAb (polyclonal)  
PM070 Anti-E-tag pAb (polyclonal)  
PM022 Anti-T7-tag pAb (polyclonal)  
563 Anti-VSV-G-tag pAb (polyclonal)  
M071-3 Anti-GST-tag mAb (3B2)  
PM022 Anti-GST-tag pAb (polyclonal)  
M095-3 Anti-Luciferase mAb (2D4)  
PM016 Anti-Luciferase pAb (polyclonal)  
PM047 Anti-Renilla Luciferase pAb (polyclonal)  
M094-3 Anti- $\beta$ -galactosidase mAb (5A3)  
M203-3 Anti- $\beta$ -galactosidase mAb (6F4)  
PM049 Anti- $\beta$ -galactosidase pAb (polyclonal)  
M091-3 Anti-MBP (Maltose Binding Protein) mAb (1G12)  
M013-3 Anti-Thioredoxin (Trx-tag) mAb (2C9)  
PM015 Anti-CBD (Chitin Binding Domain) pAb (polyclonal)  
PM071 Anti-Calmodulin Binding Protein-tag pAb (polyclonal)  
M211-3 Anti-Strep-tag II mAb (4F1)  
M214-3 Anti-mini-AID-tag mAb (1E4)  
M214-7 Anti-mini-AID-tag mAb-HRP-Direct (1E4)

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D153-11 Anti-GFP mAb-Magnetic Beads (RQ2)  
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M180-11 Anti-HA-tag mAb-Magnetic Beads (TANA2)  
M132-11 Anti-HA-tag mAb-Magnetic Beads (5D8)  
M185-11 Anti-DDDDK-tag mAb-Magnetic Beads (FLA-1)  
M047-11 Anti-Myc-tag mAb-Magnetic Beads (PL14)  
D291-11 Anti-His-tag mAb-Magnetic Beads (OGHis)  
M167-11 Anti-V5-tag mAb-Magnetic Beads (1H6)  
M215-11 Anti-V5-tag mAb-Magnetic Beads (OZA3)

M198-9 Anti-E-tag mAb-Magnetic beads (21D11)  
D058-9 Anti-Multi Ubiquitin mAb-Magnetic beads (FK2)  
M075-11 Mouse IgG1 (isotype control)-Magnetic Beads  
M076-11 Mouse IgG2a (isotype control)-Magnetic Beads  
M077-11 Mouse IgG2b (isotype control)-Magnetic Beads  
M081-11 Rat IgG2a (isotype control)-Magnetic Beads  
M180-10 Anti-HA-tag mAb-Magnetic Agarose (TANA2)  
M132-10 Anti-HA-tag mAb-Magnetic Agarose (5D8)  
M185-10 Anti-DDDDK-tag mAb-Magnetic Agarose (FLA-1)  
M047-10 Anti-Myc-tag mAb-Magnetic Agarose (PL14)  
D291-10 Anti-His-tag mAb-Magnetic Agarose (OGHis)  
D153-10 Anti-GFP mAb-Magnetic Agarose (RQ2)  
M165-10 Anti-RFP mAb-Magnetic Agarose (3G5)  
M167-10 Anti-V5-tag mAb-Magnetic Agarose (1H6)  
M198-10 Anti-E-tag mAb-Magnetic Agarose (21D11)  
M201-10 Anti-Phosphotyrosine mAb-Magnetic Agarose (PT4)

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3342 HA-tagged Protein Magnetic PURIFICATION KIT  
3321 HA-tagged Protein PURIFICATION GEL (1 mL)  
3320-205 HA-tag peptide (2 mg x 5)  
3325 DDDDK-tagged Protein PURIFICATION KIT  
3343 DDDDK-tagged Protein Magnetic PURIFICATION KIT  
3326 DDDDK-tagged Protein PURIFICATION GEL (1 mL gel, 5 mg peptide)  
3325-205 DDDDK-tag peptide (1 mg x 5)  
3305 c-Myc-tagged Protein MILD PURIFICATION KIT Ver. 2  
3340 c-Myc-tagged Protein Magnetic PURIFICATION KIT  
3306 c-Myc-tagged Protein MILD PURIFICATION GEL (1 mL gel, 1 mg peptide)  
3310 His-tagged Protein PURIFICATION KIT  
3311 His-tagged Protein PURIFICATION GEL (1 mL gel, 5 mg peptide)  
3317 V5-tagged Protein PURIFICATION KIT Ver.2  
3341 V5-tagged Protein Magnetic PURIFICATION KIT  
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