14-3-3η (eta) Mouse Monoclonal Antibody

MCA-3G12

Ordering Information
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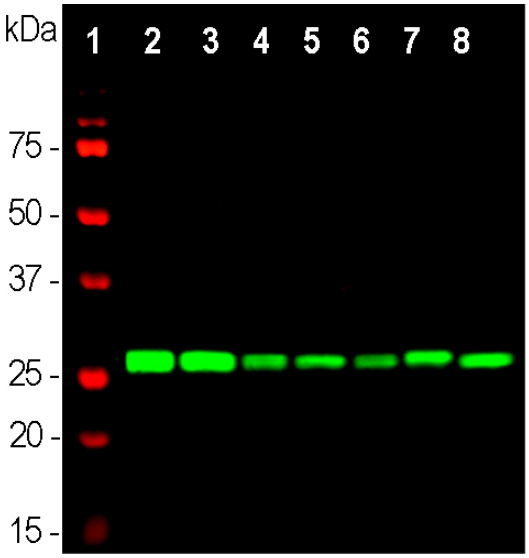
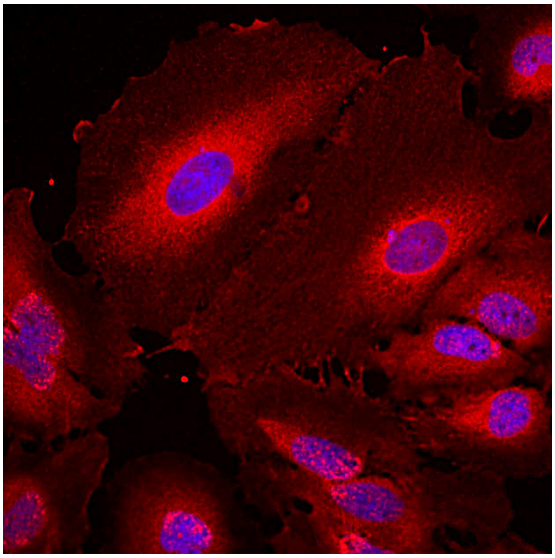
HGNC Name: *YWHAH*
UniProt: *Q04917*
RRID: *AB_2572217*
Immunogen: *Full length human recombinant 14-3-3η (eta) protein expressed in and purified from E.coli.*
Format: *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Stable at 4°C for one year, for longer term store at -20°C*
Recommended dilutions:
WB: 1:5,000. IF/ICC and IHC: 1:1,000.

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC, IHC	Mouse	IgG1	28kDa	Hu, Rt, Ms, Co, Pi, Do



Western blot analysis of whole brain lysates (lanes 2,3), and cell lysates (lanes 4-8), using mouse mAb to 14-3-3η, MCA-3G12, dilution 1:5,000 in green: [1] protein standard (red), [2] rat brain, [3] mouse brain, [4] NIH-3T3, [5] HEK293, [6] HeLa, [7] SH-SY5Y, [8] C6 cells. Strong band at 28kDa corresponds to 14-3-3η protein, expressed in all preparations.



Immunofluorescent analysis of HeLa cells stained with mouse mAb to 14-3-3η, MCA-3G12, dilution 1:1,000 in red. Blue is DAPI staining of nuclear DNA. The MCA-3G12 antibody reveals the diffuse cytoplasmic distribution of 14-3-3η protein with higher concentration in the perinuclear region.

Background:

The 14-3-3 family of proteins was originally discovered as prominent protein spots on 2-dimensional gels. They are 28-33kDa proteins and are major components of the cytoplasm (1). They act as binding partners for phosphoserine and phosphothreonine sites on other proteins, though they also have binding partners which are not phosphorylation-dependent. These binding interactions are important in the regulation of molecules such as signaling kinases in the MAP kinase pathway, c-Raf and b-Raf, the proapoptotic molecules Bad and Bax, and the cell cycle regulator Cdc25. There are seven distinct mammalian 14-3-3 proteins encoded by different genes, and they are normally expressed as homodimers or in some cases heterodimers. 14-3-3η or 14-3-3 eta is one of these seven widely expressed and concentrated in the nervous system. An alternate name for 14-3-3η is tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein 1, due to this protein's role in the activation of tyrosine and tryptophan hydroxylases. The 14-3-3η protein accumulates in the CSF of patients suffering from Creutzfeld-Jacob Disease, and thus can be used for the diagnosis of this disease (2). Furthermore, this protein binds α-synuclein in the Lewy bodies of Parkinson's disease-affected brains and TDP43 in ALS affected anterior horn neurons (3,4). Decreased level of expression of 14-3-3η and several other 14-3-3 family members has been linked to early-onset schizophrenia (5). For reviews of the entire 14-3-3 family of proteins see references 6 and 7.

The MCA-3G12 antibody was made against the full length human recombinant 14-3-3η protein, expressed in and purified from *E.coli*, and works well on western blots and on cells and sections by IF, ICC and IHC. The protein is very abundant and as a result the antibody is a very effective western blot loading control.

References:

1. Morrison DK. et al. The 14-3-3 proteins: integrators of diverse signaling cues that impact cell fate and cancer development. Trends Cell Biol. 19:16-23 (2009).
2. Hsich G. et al. The 14-3-3 brain protein in cerebrospinal fluid as a marker for transmissible spongiform encephalopathies. N. Engl. J. Med. 335:924-30 (1996).
3. Ubl A. et al. 14-3-3 protein is a component of Lewy bodies in Parkinson's disease-mutation analysis and association studies of 14-3-3 eta. Brain Res. Mol. Brain Res. 108:33-9 (2002).
4. Umahara T. et al. 14-3-3 eta isoform colocalizes TDP-43 on the coarse granules in the anterior horn cells of patients with sporadic amyotrophic lateral sclerosis. Brain Res. 1646:132–138 (2016).
5. Middleton FA, et al. Altered expression of 14-3-3 genes in the prefrontal cortex of subjects with schizophrenia. Neuropsychopharm. 30:974-83 (2005).
6. Fu H, Subramanian RR, Masters SC. 14-3-3 proteins: structure, function, and regulation. Ann. Rev. Pharmacol. Toxicol. 40:617-47 (2000).
7. Yaffe MB. How do 14-3-3 proteins work? – Gatekeeper phosphorylation and the molecular anvil hypothesis FEBS Lett. 513:53-7 (2002).

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.