

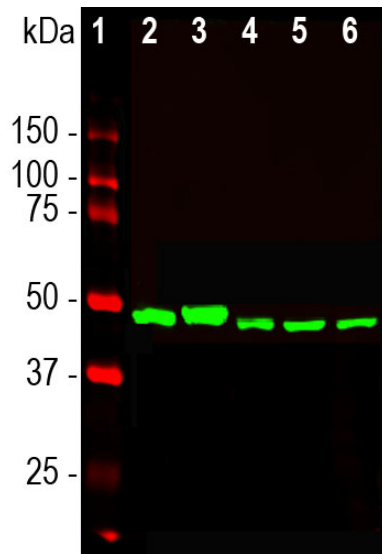
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**HGNC Name:** ENO1  
**UniProt:** Q9X5J4  
**RRID:** AB\_2572307  
**Immunogen:** N-terminal 12 amino acids of bovine enolase 1  
**Format:** Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN<sub>3</sub>  
**Storage:** Store at 4°C for short term, for longer term at -20°C  
**Recommended dilutions:**  
 WB: 1:5,000-1:10,000 IF/ICC: 1:2,000-1:5,000. IHC: 1:1,000.

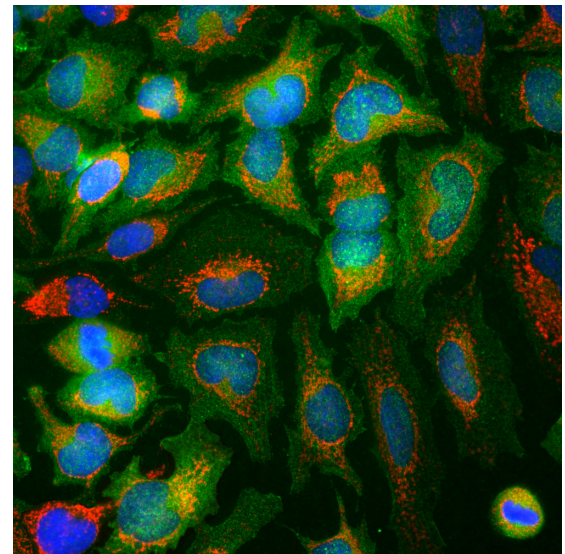
#### References:

1. Wu W, et al. Identification and validation of metastasis-associated proteins in head and neck cancer cell lines by two-dimensional electrophoresis and mass spectrometry. *Clin Exp Metastasis*.9(4):319-26 (2002). *Clin Exp Metastasis*. 19:319-26 (2002).
2. Tu SH, et al. Increased expression of enolase alpha in human breast cancer confers tamifer resistant in human breast cancer cells. *Breast Cancer Res. Treat.* 121:539-53 (2010).
3. Marangos PJ, Schmechel DE, Parma AM, Goodwin FK. Developmental profile of neuron-specific (NSE) and non-neuronal (NNE) enolase. *Brain Res.* 190:185-93 (1980).
4. Smith WC, et al. Interaction of arrestin with enolase 1 in photoreceptor. *Invest Ophthalmol Vis Sci.* 52:1832-40 (2011).
5. Tam JP, Zavala F.J. Multiple antigen peptide. A novel approach to increase detection sensitivity of synthetic peptides in solid-phase immunoassays. *J. Immunol Methods.* 124:53-61 (1989).

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC,	Mouse	IgG1	47kDa	Hu, Rt, Ms, Bo, Po, Ho



Western blot analysis of different cell lysates using mouse mAb to  $\alpha$ -enolase, MCA-253, dilution 1:10,000 in green: [1] protein standard (red), [2] NIH-3T3 I, [3] C6, [4] HEK293, [5] HeLa, and [6] SH-SY5Y cells. A strong single band at 47kDa corresponds to the  $\alpha$ -enolase protein.



Immunofluorescent analysis of HeLa cells stained with mouse mAb to  $\alpha$ -enolase, MCA-253, dilution 1:500 in green and costained with chicken pAb to HSP60, CPCA-HSP60, dilution 1:5,000, in red. The blue is DAPI staining of nuclear DNA. The MCA-253 antibody reveals strong cytoplasmic staining while the chicken HSP60 antibody specifically labels mitochondria in these cells.

#### Background:

Enolase 1 is an enzyme which catalyzes the conversion of 2-phosphoglycerate to phosphoenolpyruvate in the glycolytic pathway, and also the reverse reaction in gluconeogenesis. It is one of three mammalian enolases, which closely are related in protein sequence (see [here](#)), and have different cell type specific expression patterns, so that antibodies to them are useful cell type specific markers. Enolase 1 is also known as  $\alpha$  enolase and as non-neuronal enolase or NNE. Neuron specific enolase (NSE) corresponds to enolase 2 or  $\gamma$  enolase and is heavily expressed in neuronal cells. The third enolase, enolase 3 or  $\beta$  enolase, is expressed in muscle cells. Enolase 1 is expressed in most kinds of tissue, but is absent from neurons. Abnormal expression of enolase 1 is associated with tumor progression in some breast and head and neck cancer (1,2). We also market antibodies directed against neuronal specific enolase, [RPCA-NSE](#). A switch from enolase 1 to NSE expression occurs in the development of neurons (3).

The MCA-253 antibody was made against the N-terminal 12 amino acids of enolase 1, the sequence MSILKLVAREIF formed into an 8 armed MAP construct using the procedure of Tam et al. (4). This produces a [dendrimer](#) presenting 8 peptides to the immune system obviating the need for coupling to KLH or other carrier protein. The antibody works well for western blotting and for IF, ICC and IHC (for IHC see data under "Additional Info" tab). The production and characterization of this antibody has been described in peer reviewed form, showing specificity of enolase 1 and no binding to enolase 2 and enolase 3 (5). We also supply polyclonal antibodies to NSE made in rabbit and chicken, [RPCA-NSE](#) and [CPCA-NSE](#).

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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.