abcam

# ab222514

# Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680]

Recombinant | RabMAb

## Key facts

| | |
|---|---|
| **Isotype** | IgG |
| **Host species** | Rabbit |
| **Storage buffer** | pH: 7.2 - 7.4 Preservative: 0.01% Sodium azide Constituents: PBS, 40% Glycerol (glycerin, glycerine), 0.05% BSA |
| **Form** | Liquid |
| **Clonality** | Monoclonal |
| **Immunogen** | The exact immunogen used to generate this antibody is proprietary information. |
| **Clone number** | EPR19680 |
| **Purification technique** | Affinity purification Protein A |
| **Concentration** | 0.845 mg/mL The concentration of this product may be batch-dependent<br>Batch concentration finder → |

## Reactivity data

## WB

### Tested

| | |
|---|---|
| **Species** | Mouse |
| **Dilution info** | 1/1000 |
| **Notes** | - |

| | |
|---|---|
| **Species** | Human |

| | |
|---|---|
| **Dilution info** | 1/1000 |
| **Notes** | - |

## ICC/IF

### Tested

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | 1/500 |
| **Notes** | - |

### Expected

| | |
|---|---|
| **Species** | Mouse |
| **Dilution info** | Use at an assay dependent concentration. |
| **Notes** | - |

## Flow Cyt (Intra)

### Tested

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | 1/800 |
| **Notes** | - |

### Expected

| | |
|---|---|
| **Species** | Mouse |
| **Dilution info** | Use at an assay dependent concentration. |
| **Notes** | - |

## IHC-P

### Tested

| | |
|---|---|
| **Species** | Mouse |
| **Dilution info** | 1/2000 |

| | |
|---|---|
| **Notes** | Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol. |

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | 1/2000 |
| **Notes** | Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol. |

## Target data

See full target information ENO1

| | |
|---|---|
| **Function** | Enolase that catalyzes the conversion of 2-phosphoglycerate to phosphoenolpyruvate in glycolysis and the reverse reaction in gluconeogenesis (PubMed:1369209, PubMed:29775581). Also involved in various processes such as growth control, hypoxia tolerance and allergic responses (PubMed:10802057, PubMed:12666133, PubMed:2005901, PubMed:29775581). May also function in the intravascular and pericellular fibrinolytic system due to its ability to serve as a receptor and activator of plasminogen on the cell surface of several cell-types such as leukocytes and neurons (PubMed:12666133). Stimulates immunoglobulin production (PubMed:1369209). Isoform MBP-1. Binds to the myc promoter and acts as a transcriptional repressor. May be a tumor suppressor. |

## Storage

| | |
|---|---|
| **Shipped at conditions** | Conditional Ambient |
| **Appropriate short-term storage duration** | 1-2 weeks |
| **Appropriate short-term storage conditions** | +4°C |
| **Appropriate long-term storage conditions** | -20°C |
| **Aliquoting information** | Upon delivery aliquot |
| **Storage information** | Avoid freeze / thaw cycle |

## Notes

**Patented technology**
Our RabMAb® technology is a patented hybridoma-based technology for making rabbit monoclonal antibodies. For details on our patents, please refer to RabMAb® patents.

**What are the advantages of a recombinant monoclonal antibody?**
This product is a recombinant monoclonal antibody, which offers several advantages including:

- High batch-to-batch consistency and reproducibility
- Improved sensitivity and specificity
- Long-term security of supply
- Animal-free batch production

For more information, read more on recombinant antibodies.

## Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

| | |
|---|---|
| **Activity summary** | ENO1 ENO2 and ENO3 also known as alpha gamma and beta enolase are isoenzymes involved in the glycolytic pathway. Each enolase isoenzyme offers specific mechanical functions in this energy-producing process. ENO1 has an approximate mass of 47 kDa and is widely expressed in most tissues. ENO2 similar in size is primarily found in neural and neuroendocrine tissues. ENO3 also roughly 47 kDa predominantly expresses in muscle tissue. These proteins catalyze the reversible conversion of 2-phosphoglycerate to phosphoenolpyruvate playing an important role in glycolysis. |
| **Biological function summary** | The enolase family of isoenzymes acts as multifunctional catalysts and has roles beyond glycolysis. ENO1 serves as a plasminogen receptor on cell surfaces assisting in tissue remodeling and immune response. ENO2 often referred to as neuron-specific enolase (NSE) functions importantly in neural development and tumor cell metabolism. ENO3 or muscle-specific enolase contributes to muscle metabolism and energy turnover. While these proteins individually carry out essential tasks they also form a complex that facilitates efficient energy production and cellular regulation. |
| **Pathways** | The enolase enzymes integrate in the glycolytic and gluconeogenesis pathways central to energy metabolism. Glycolysis involves other key proteins like hexokinase and phosphofructokinase cooperating for glucose breakdown and energy release. In gluconeogenesis the enolases help generate glucose from non-carbohydrate sources important during fasting or intense exercise. Their activity along with related proteins impacts the efficiency and regulation of energy metabolism pathways. |
| **Associated diseases and disorders** | Enolase dysregulation associates with conditions like cancer and neuromuscular diseases. Elevated ENO2 levels often serve as a biomarker for neuroendocrine tumors and a target for cancer therapies. ENO3 mutations link to muscle metabolic disorders including glycogen storage diseases. ENO1 interaction with proteins such as plasminogen can influence cancer cell invasion and metastasis highlighting its relevance in disease progression and potential therapeutic interventions. |

## Product promise

**Tested**

We have tested this species and application combination and it works. It is covered by our product promise.

**Expected**

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

**Predicted**

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

**Not recommended**

We do not recommend this combination. It is not covered by our product promise.

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We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

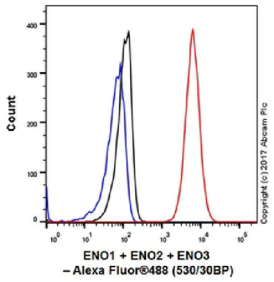
In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

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## 10 product images

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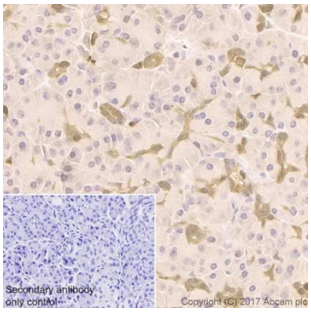



### Flow Cytometry (Intracellular) - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

ENO1 + ENO2 + ENO3 Flow Cytometry (Intracellular) staining using rabbit Anti-ENO1 + ENO2 + ENO3 antibody

Intracellular flow cytometric analysis of 4% paraformaldehyde fixedHeLa (human cervix adenocarcinoma epithelial cell) cell line labeling ENO1 + ENO2 + ENO3with ab222514 at 1/800 (red) compared with an isotype control Rabbit monoclonal IgG (ab172730) (black) and an unlabelled control (cells without incubation with primary antibody and secondary antibody) (blue). Secondary antibody Goat anti rabbit IgG Alexa Fluor® 488 (ab150077), at 1/2000 dilution was used as the secondary antibody.

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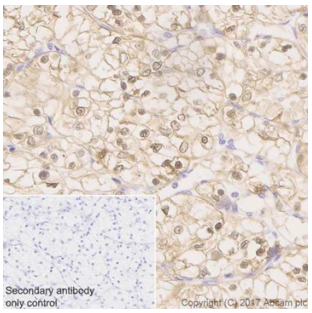

### Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

ENO1 + ENO2 + ENO3 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-ENO1 + ENO2 + ENO3 antibody

Immunohistochemical analysis of paraffin embedded human pancreas tissue labeling ENO1 + ENO2 + ENO3 with ab222514 at 1/2000 dilution followed by Goat Anti-Rabbit IgG H&L (HRP) ready

to use. Cytoplasmic and nuclear staining on medium-small ducts of human pancreas (PMID: 19425054). Counter stained with hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) ready to use.

Perform heat mediated antigen retrieval with EDTA buffer pH 9 before commencing with IHC staining protocol.

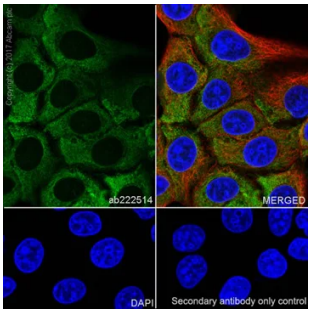



## Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

ENO1 + ENO2 + ENO3 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-ENO1 + ENO2 + ENO3 antibody

Immunohistochemical analysis of paraffin embedded human clear cell carcinoma tissue labeling ENO1 + ENO2 + ENO3 with ab222514 at 1/2000 dilution followed by Goat Anti-Rabbit IgG H&L (HRP) ready to use. Membranous and nuclear staining on human clear cell kidney carcinoma is observed. Counter stained with hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) ready to use.

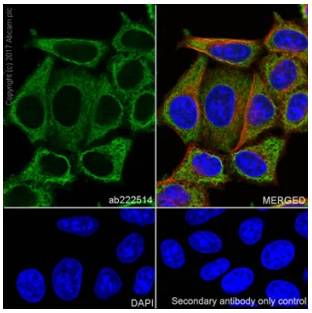
Perform heat mediated antigen retrieval with EDTA buffer pH 9 before commencing with IHC staining protocol.




## Immunocytochemistry/ Immunofluorescence - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

ENO1 + ENO2 + ENO3 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-ENO1 + ENO2 + ENO3 antibody

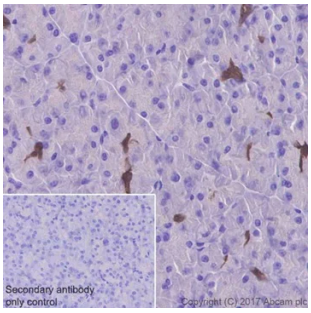
Immunofluorescent analysis of 100% methanol fixed MCF7 (human breast adenocarcinoma epithelial cell) cells labeling ENO1 + ENO2 + ENO3 with ab222514 at 1/500 dilution followed by AlexaFluor®488 Goat anti-Rabbit secondary (ab150077) secondary antibody at 1/1000 dilution (green). Confocal image showing cytoplasmic staining on MCF7 cell line.
Counterstains: ab195889 Anti-alpha Tubulin antibody [DM1A] (red) - Microtubule Marker (Alexa Fluor® 594) (1/200). DAPI (blue).




## Immunocytochemistry/ Immunofluorescence - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

ENO1 + ENO2 + ENO3 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-ENO1 + ENO2 + ENO3 antibody

Immunofluorescent analysis of 100% methanol fixed HeLa (human cervix adenocarcinoma epithelial cell) cells labeling ENO1 + ENO2 + ENO3 with ab222514 at 1/500 dilution followed by AlexaFluor®488 Goat anti-Rabbit secondary (ab150077) secondary antibody at 1/1000 dilution (green). Confocal image showing cytoplasmic staining on HeLa cell line.
Counterstains: ab195889 Anti-alpha Tubulin antibody [DM1A] (red) - Microtubule Marker (Alexa Fluor® 594) (1/200). DAPI (blue).

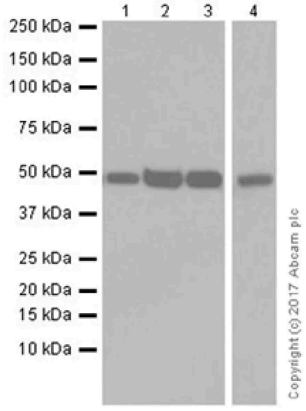



## Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

ENO1 + ENO2 + ENO3 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-ENO1 + ENO2 + ENO3 antibody

Immunohistochemical analysis of paraffin embedded mouse pancreas tissue labeling ENO1 + ENO2 + ENO3 with ab222514 at 1/2000 dilution followed by Goat Anti-Rabbit IgG H&L (HRP) ready to use. Cytoplasmic and nuclear staining on the medium-small ducts of normal mouse pancreas is observed. Counter stained with hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) ready to use.

Perform heat mediated antigen retrieval with EDTA buffer pH 9 before commencing with IHC staining protocol.




## Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

Blocking: 5% NFDM/TBST.
Exposure times:

Lane 1-3: 3 seconds

Lane 4: 1 seconds

All lanes:
Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514) at 1/2000 dilution

Lane 1:
Human fetal heart at 10 µg

Lane 2:
Human fetal kidney at 10 µg

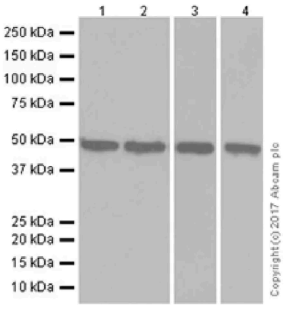
Lane 3:
Human fetal spleen at 10 µg

Lane 4:
Human fetal brain at 10 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/100000 dilution

Observed band size: 47 kDa




## Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

Blocking: 5% NFDM/TBST.
Exposure times:

Lane 1/2/4: 1 seconds

Lane 3: 3 seconds

Lanes 1 - 3:
Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514) at 1/2000 dilution

Lane 4:
Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514) at 1/10000 dilution

Lane 1:
HeLa (human cervix adenocarcinoma epithelial cell), whole cell lysate at 10 µg

Lane 2:
Jurkat (human T cell leukemia T lymphocyte), whole cell lysate at 10 µg

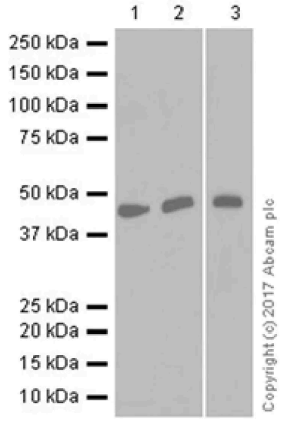
Lane 3:
Human skeletal muscle at 10 µg

Lane 4:
MCF7 (human breast adenocarcinoma epithelial cell), whole cell lysate at 10 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/100000 dilution

Observed band size: 47 kDa




## Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

Blocking: 5% NFDM/TBST.
Exposure times:

Lanes 1 & 2: 3 seconds

Lane 3: 1 seconds

All lanes:
Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514) at 1/1000 dilution

Lane 1:
His-tagged human ENO1 (aa2-434) recombinant protein, 10 ng

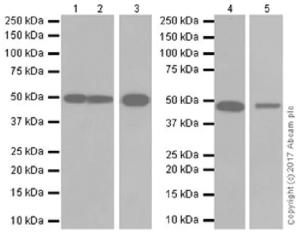
Lane 2:
His-tagged human ENO2 (aa1-434) recombinant protein, 10 ng

Lane 3:
His-tagged human ENO3 (aa1-434) recombinant protein, 10 ng

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/100000 dilution

Observed band size: 47 kDa




## Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514)

ENO1 + ENO2 + ENO3 Western blot staining using rabbit Anti-ENO1 + ENO2 + ENO3 antibody

Blocking : 5% NFDM/TBST.
Exposure times:

Lane 1, 2 and 4: 3 minutes

Lane 3: 1 minute

Lane 5: 3 seconds

All lanes:
Western blot - Anti-ENO1 + ENO2 + ENO3 antibody [EPR19680] (ab222514) at 1/2000 dilution

Lane 1:
Mouse brain at 10 µg

Lane 2:
Mouse spleen at 10 µg

Lane 3:
Mouse kidney at 10 µg

Lane 4:
NIH/3T3 (mouse embryonic fibroblast), whole cell lysate at 10 µg

Lane 5:
RAW264.7 (mouse Abelson murine leukemia virus-induced tumor macrophage), whole cell lysate at 10 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/100000 dilution

Observed band size: 47 kDa

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