abcam

**ab181091**

# Anti-MDH1 antibody [EPR13596(B)]

Recombinant | RabMAb | KO Validated

## Key facts

| | |
|---|---|
| **Isotype** | IgG |
| **Host species** | Rabbit |
| **Storage buffer** | 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** | EPR13596(B) |
| **Purity** | Tissue culture supernatant |

## Reactivity data

## WB

### Tested

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | 1/1000 - 1/2000 |
| **Notes** | - |

### Predicted

| | |
|---|---|
| **Species** | Mouse, Rat |

| | |
|---|---|
| **Dilution info** | - |
| **Notes** | - |

## Flow Cyt (Intra)

### Tested

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | 1/100 |
| **Notes** | ab172730 - Rabbit monoclonal IgG, is suitable for use as an isotype control with this antibody. |

### Predicted

| | |
|---|---|
| **Species** | Mouse, Rat |
| **Dilution info** | - |
| **Notes** | - |

## Target data

See full target information MDH1

| | |
|---|---|
| **Function** | Catalyzes the reduction of aromatic alpha-keto acids in the presence of NADH (PubMed:2449162, PubMed:3052244). Plays essential roles in the malate-aspartate shuttle and the tricarboxylic acid cycle, important in mitochondrial NADH supply for oxidative phosphorylation (PubMed:31538237). Catalyzes the reduction of 2-oxoglutarate to 2-hydroxyglutarate, leading to elevated reactive oxygen species (ROS) (PubMed:34012073). |

## 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** | The cytosolic malate dehydrogenase commonly called MDH1 or malate dehydrogenase 1 is an enzyme that plays an important role in the citric acid cycle. Its main function is to catalyze the reversible conversion of malate to oxaloacetate using NAD+ as a cofactor. This enzyme has an approximate molecular mass of 36 kDa. MDH1 is expressed in the cytosol of various cell types throughout the body. It is critical in enabling cells to efficiently convert biochemical energy from nutrients into ATP which is vital for cellular function and survival. |
| **Biological function summary** | This enzyme supports numerous cellular processes by maintaining redox balance and facilitating energy production. MDH1 acts independently and isn't part of any larger protein complex. However its efficiency directly impacts the cycling of metabolites necessary for cellular respiration and energy metabolism. By converting malate into oxaloacetate MDH1 directly influences processes critical for the maintenance of cell health and function. |
| **Pathways** | MDH1 is an integral component of the tricarboxylic acid (TCA) cycle and the malate-aspartate shuttle. In the TCA cycle it plays an important role in the conversion steps that drive energy generation within cells. Additionally the malate-aspartate shuttle is an important pathway connecting cytosolic and mitochondrial processes by facilitating the exchange of reducing equivalents. Through these pathways MDH1 interacts and collaborates with proteins like aspartate aminotransferase (GOT1) and mitochondrial malate dehydrogenase (MDH2) showcasing the interconnected nature of metabolic pathways. |
| **Associated diseases and disorders** | Dysfunction or abnormal expression of MDH1 has been associated with various conditions including cancer and metabolic syndromes. In cancer aberrant MDH1 |

activity can lead to altered energy metabolism promoting tumor progression and survival. Additionally MDH1's role in glucose and lipid metabolism makes it relevant in metabolic syndrome where improper energy balance can exacerbate disease states. Proteins connected through these associations include hypoxia-inducible factor 1-alpha (HIF-1α) in cancer metabolism and insulin signaling proteins in metabolic syndromes further illustrating the broader implications of MDH1's function in health and disease.

## 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**

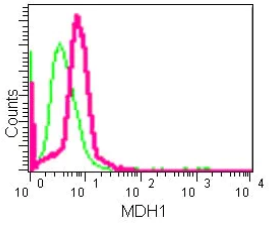
We do not recommend this combination. It is not covered by our product promise.

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.

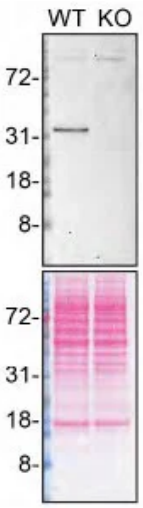
## 3 product images




### Flow Cytometry (Intracellular) - Anti-MDH1 antibody [EPR13596(B)] (ab181091)

MDH1 Flow Cytometry (Intracellular) staining using rabbit Anti-MDH1 antibody

Intracellular flow cytometric analysis of 2%paraformaldehyde-fixedJurkat cells labeling MDH1 with ab181091 at 1/100 dilution (red) compared to a Rabbit monoclonal IgG isotype control (green), followed by Goat anti rabbit IgG (FITC) secondary antibody at 1/150 dilution.




## Western blot - Anti-MDH1 antibody [EPR13596(B)] (ab181091)

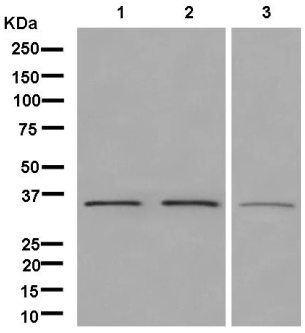
MDH1 Western blot staining using rabbit Anti-MDH1 antibody

ab181091 was shown to react with MDH1 in wild-type HAP1 cells in Western blot with loss of signal observed in a MDH1 knockout cell line. Wild-type HAP1 and MDH1 knockout cell lysates were subjected to SDS-PAGE. Membranes were blocked in 5% milk in TBST for 1 hr before incubation with ab181091 overnight at 4 °C at a 1/1000 dilution. Blots were incubated with secondary antibodies at 0.2 µg/mL before imaging.

This data was provided by YCharOS Inc., an open science company with the mission of characterizing commercially available antibody reagents for all human proteins. Abcam and YCharOS are working together to help address the reproducibility crisis by enabling the life science community to better evaluate commercially available antibodies.
All lanes:
Western blot - Anti-MDH1 antibody [EPR13596(B)] (ab181091) at 1/1000 dilution

Lane 1:
Wild-type HAP1 lysate at 20 µg

Lane 2:
MDH1 knock-out HAP1 lysate at 20 µg




## Western blot - Anti-MDH1 antibody [EPR13596(B)] (ab181091)

MDH1 Western blot staining using rabbit Anti-MDH1 antibody

All lanes:
Western blot - Anti-MDH1 antibody [EPR13596(B)] (ab181091) at 1/2000 dilution

Lane 1:
Human spleen lysate at 20 µg

Lane 2:
HepG2 cell lysate at 20 µg

Lane 3:
HeLa cell lysate at 20 µg

Secondary

All lanes:
Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugate at 1/1000 dilution

Predicted band size: 36 kDa

Observed band size: 36 kDa

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.