abcam

ab232190

Anti-MDH1 antibody [EPR13597(B)] - BSA and Azide free

Recombinant | RabMAb | KO Validated

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	pH: 7.2 - 7.4 Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	The exact immunogen used to generate this antibody is proprietary information.
Carrier free	Yes
Clone number	EPR13597(B)
Purification technique	Affinity purification Protein A
Concentration	1.088 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IP

Tested

Species	Human
Dilution info	-

Notes	-

Predicted

Species	Mouse, Rat
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	-
Notes	-

Predicted

Species	Mouse, Rat
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	-
Notes	-

Predicted

Species	Mouse, Rat
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	-
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	Blue Ice
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	+4°C
Storage information	Do Not Freeze

Notes

ab232190 is the carrier-free version of ab180152.

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.

Conjugation ready
Our carrier-free antibodies are typically supplied in a PBS-only formulation, purified and free of BSA, sodium azide and glycerol. This conjugation-ready format is designed for use with fluorochromes, metal isotopes, oligonucleotides, and enzymes, which makes them ideal for antibody labelling, functional and cell-based assays, flow-based assays (e.g. mass cytometry) and Multiplex Imaging applications.

Use our conjugation kits for antibody conjugates that are ready-to-use in as little as 20 minutes with 1 minute hands-on-time and 100% antibody recovery: available for fluorescent dyes, HRP, biotin and gold.

Compatibility
This product is compatible with the Maxpar® Antibody Labeling Kit from Fluidigm, without the need for antibody preparation. Maxpar® is a trademark of Fluidigm Canada Inc.

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

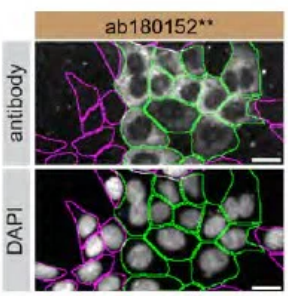
We do not recommend this combination. It is not covered by our product promise.

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.

5 product images



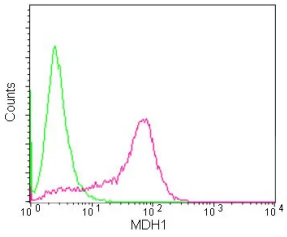
Immunocytochemistry/ Immunofluorescence - Anti-MDH1 antibody [EPR13597(B)] - BSA and Azide free (ab232190)

MDH1 Immunocytochemistry/ Immunofluorescence staining of Wild-type HAP1 cells using rabbit Anti-MDH1 antibody

This data was developed using ab180152, the same antibody clone in a different buffer formulation.
ab180152 was shown to react with MDH1 in wild-type HAP1 cells in immunocytochemistry with loss of signal observed in a MDH1 knockout cell line. Wild-type and knockout cells were mixed and

pelleted at a 1:1 ratio on coverslips. The cells were fixed with 4% paraformaldehyde (15 min) then permeabilized with 0.1% Triton X-100 (10min) and then blocked with 1x PBS, 0.01% Triton X-100, 5% BSA, 5% NGS. The cells were then incubated with ab180152 at 1/100 dilution overnight at 4°C followed by a further incubation at room temperature for 1h with a goat anti-rabbit secondary antibody to (Alexa Fluor® 555) at 0.5 µg/ml. Acquisition of the green (wild-type), red (antibody staining) and far-red (knockout) channels was performed. Representative grayscale images of the red channel are shown. Wild-type and knockout cells are outlined with yellow and magenta dashed line, respectively. Schematic representation of the mosaic strategy used is shown on the bottom-right panel. Image was acquired with a Zeiss(LSM-880).

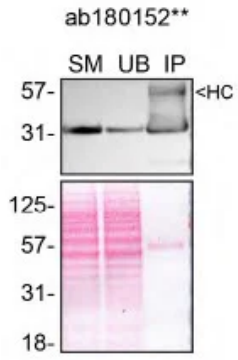
This data was provided by YCharOS Inc., an open science company with the mission of characterizing commercially available antibody reagents for all human proteins. Abcam and YCharOS are working together to help address the reproducibility crisis by enabling the life science community to better evaluate commercially available antibodies.



Flow Cytometry (Intracellular) - Anti-MDH1 antibody [EPR13597(B)] - BSA and Azide free (ab232190)

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

Intracellular flow cytometric analysis of 2% paraformaldehyde-fixed HeLa cells labeling MDH1 with ab180152 at 1/20 dilution followed by Goat anti rabbit IgG (FITC) at 1/75 dilution (red), compared to a Rabbit IgG control (green).
This data was developed using the same antibody clone in a different buffer formulation containing PBS, BSA, glycerol, and sodium azide (ab180152).

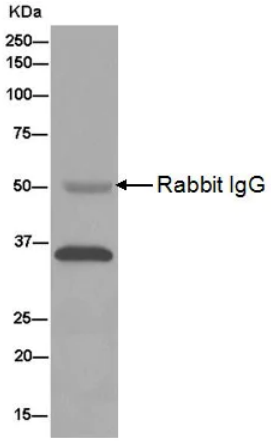


Immunoprecipitation - Anti-MDH1 antibody [EPR13597(B)] - BSA and Azide free (ab232190)

This data was developed using ab180152, the same antibody clone in a different buffer formulation.
Immunoprecipitation of MDH1 in HAP1 cells. Lysates were prepared and immunoprecipitation was performed using 2 µg of ab180152 pre-coupled to Protein A beads. Samples were then washed and processed for western blot.

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:
Immunoprecipitation - Anti-MDH1 antibody [EPR13597(B)] - C-terminal (ab180152) at 2 µg

All lanes:
MDH1 in HAP1 cells at 2 µg

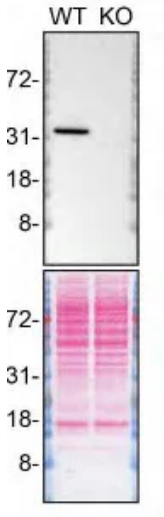


Immunoprecipitation - Anti-MDH1 antibody [EPR13597(B)] - BSA and Azide free (ab232190)

Western blot analysis of HepG2 cell lysate immunoprecipitated with ab180152 at 1/50 dilution followed by Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated secondary antibody at 1/1000 dilution
This data was developed using the same antibody clone in a different buffer formulation containing PBS, BSA, glycerol, and sodium azide (ab180152).

All lanes:
Immunoprecipitation - Anti-MDH1 antibody [EPR13597(B)] - C-terminal (ab180152)

Predicted band size: 36 kDa



Western blot - Anti-MDH1 antibody [EPR13597(B)] - BSA and Azide free (ab232190)

MDH1 Western blot staining using rabbit Anti-MDH1 antibody

This data was developed using ab180152, the same antibody clone in a different buffer formulation.
ab180152 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 ab180152 overnight at 4 °C at a 1/10000 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 [EPR13597(B)] - C-terminal (ab180152) at 1/10000 dilution

Lane 1:
Wild-type HAP1 lysate at 20 µg

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

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