abcam

ab220789

Anti-CPT1A antibody [EPR21843-71-1C]

Recombinant | RabMAb | KO Validated | 20ul selling size

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	EPR21843-71-1C
Purification technique	Affinity purification Protein A
Specificity	Our WB images were generated by testing un-bolied samples.
Concentration	0.594 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IP

Tested

Species	Human
Dilution info	1/30
Notes	-

Not recommended

Species	Recombinant fragment - Human
Dilution info	-
Notes	-

WB

Tested

Species	Recombinant fragment - Human
Dilution info	1/1000
Notes	Our WB images were generated by testing un-bolied samples.

Species	Human
Dilution info	1/1000
Notes	Our WB images were generated by testing un-bolied samples.

ICC/IF

Tested

Species	Human
Dilution info	1/100
Notes	-

Not recommended

Species	Recombinant fragment - Human
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human

Dilution info	1/600
Notes	-

Not recommended

Species	Recombinant fragment - Human
Dilution info	-
Notes	-

IHC-P

Tested

Species	Human
Dilution info	1/1000
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Not recommended

Species	Recombinant fragment - Human
Dilution info	-
Notes	-

Target data

See full target information CPT1A

Function

Catalyzes the transfer of the acyl group of long-chain fatty acid-CoA conjugates onto carnitine, an essential step for the mitochondrial uptake of long-chain fatty acids and their subsequent beta-oxidation in the mitochondrion (PubMed:11350182, PubMed:14517221, PubMed:16651524, PubMed:9691089). Also possesses a lysine succinyltransferase activity that can regulate enzymatic activity of substrate proteins such as ENO1 and metabolism independent of its classical carnitine O-palmitoyltransferase activity (PubMed:29425493). Plays an important role in hepatic triglyceride metabolism (By similarity). Also plays a role in inducible regulatory T-cell (iTreg) differentiation once activated by butyryl-CoA that antagonizes malonyl-CoA-mediated CPT1A repression (By similarity). Sustains the IFN-I response by recruiting ZDHCC4 to palmitoylate MAVS at the mitochondria leading to MAVS stabilization and activation (PubMed:38016475). Promotes ROS-

induced oxidative stress in liver injury via modulation of NFE2L2 and NLRP3-mediated signaling pathways (By similarity).

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	CPT1A also known as carnitine palmitoyltransferase 1A is a vital enzyme involved in the transport of long-chain fatty acids across the mitochondrial membrane. This protein facilitates the conversion of fatty acids into acyl-carnitine a process necessary for beta-oxidation within the mitochondria. The molecular weight of CPT1A is approximately 88 kDa. CPT1A predominantly expresses in liver cells where energy metabolism from fatty acids is important. Alternate names for this target include CPT 1 and CTP1A reflecting its central role in metabolic processes related to lipid utilization.

Biological function summary	CPT1A plays a vital role in energy production by facilitating mitochondrial fatty acid oxidation. It does not function as a solitary enzyme but often associates with other enzymes forming a multiprotein complex that includes acyl-CoA synthetase. This complex enables efficient fatty acid transport and oxidation converting stored fats into usable energy. As CPT1A primarily operates in the liver its activity significantly impacts overall lipid and energy homeostasis demonstrating its critical regulatory role.
Pathways	CPT1A is central to the fatty acid beta-oxidation pathway an important process for breaking down fatty acids to produce energy. This pathway also involves proteins such as CPT1B a related isoform present in muscle tissues. CPT1A's function is important in the liver's capacity to regulate energy balance and respond to metabolic demands. Additionally CPT1A interacts within the signaling pathway of AMPK (AMP-activated protein kinase) which further integrates it into broader metabolic regulation networks linking energy status to cellular function.
Associated diseases and disorders	CPT1A is notably associated with metabolic syndromes and fatty liver disease. Mutations or deficiencies in CPT1A can lead to disorders like hepatic carnitine palmitoyltransferase 1A deficiency characterized by hypoketotic hypoglycemia and hepatomegaly. Furthermore its dysregulation can impact proteins such as ACC1 (acetyl-CoA carboxylase) in the context of metabolic syndrome. Research continues to explore the implications of CPT1A in non-alcoholic steatohepatitis highlighting its relevance in liver energy metabolism disorders and their pathophysiology.

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

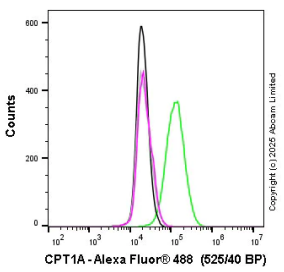
We do not recommend this combination. It is not covered by our product promise.

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:

13 product images



Flow Cytometry (Intracellular) - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

CPT1A Flow Cytometry (Intracellular) staining of HAP1 using rabbit Anti-CPT1A antibody

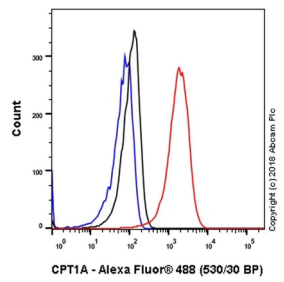
Flow cytometry overlay histogram showing wild-type HAP1 (green line) and CPT1A knockout HAP1 stained with ab220789 (magenta line). The cells were fixed with 4% formaldehyde (10 min) and then permeabilised with 0.1% PBS-Triton X-100 for 15 min. The cells were then incubated in 1x PBS containing 10% normal goat serum to block non-specific protein-protein interaction followed by the antibody (ab220789) (1x 10^6 in 100µl at 0.2 µg/ml (1/2970)) for 30min at 22°C.

The secondary antibody Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed was incubated at 1/4000 for 30min at 22°C.

Isotype control antibody was Recombinant Rabbit IgG, monoclonal [EPR25A] - Isotype Control in HAP1 WT cells (black line) and HAP1-CPT1A KO cells (grey line), at the same conditions as the primary antibody.

Acquisition of >5000 events were collected using a 50 mW Blue laser (488nm) and 525/40 bandpass filter.

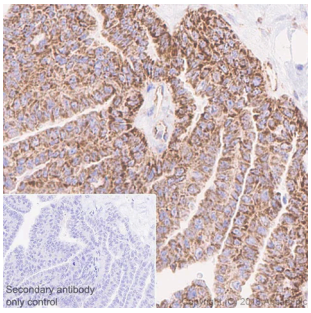
This antibody gave a positive signal in wild-type A-549 fixed with 80% methanol (5 min) and then permeabilised with 0.1% PBS-Triton X-100 for 15 min under the same conditions.



Flow Cytometry (Intracellular) - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

CPT1A Flow Cytometry (Intracellular) staining using rabbit Anti-CPT1A antibody

Intracellular flow cytometric analysis of 4% paraformaldehyde-fixed, 90% methanol-permeabilized HeLa (human epithelial cell line from cervix adenocarcinoma) cell line labeling CPT1A with ab220789 at 1/600 dilution (red) compared with a Rabbit IgG, monoclonal [EPR25A] - Isotype Control (ab172730) (black) and an unlabeled control (cells without incubation with primary antibody and secondary antibody) (blue). Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) at 1/2000 dilution was used as the secondary antibody.

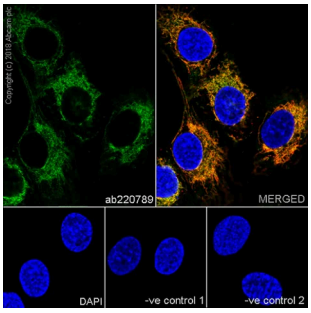


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

CPT1A Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-CPT1A antibody

Immunohistochemical analysis of paraffin-embedded human ovarian carcinoma tissue labeling CPT1A with ab220789 at 1/1000 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) Ready to use. Granular cytoplasmic staining in human ovarian carcinoma (PMID: 26716645). 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 Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.



Immunocytochemistry/ Immunofluorescence - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

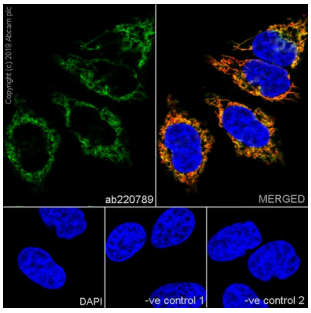
CPT1A Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-CPT1A antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized SK-OV-3 (human ovarian cancer cell line) cells labeling CPT1A with ab220789 at 1/100 dilution followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green). Confocal image showing mitochondrial staining in SK-OV-3 cell line.
The nuclear counter stain is DAPI (blue). COX IV is detected with Anti-COX IV antibody [mAbcam33985] - Mitochondrial Marker (ab33985) at 1/1000 dilution, followed by Goat Anti-Mouse IgG H&L (Alexa Fluor® 594) preadsorbed (ab150120) (red).

The negative controls are as follows:

-ve control 1: ab220789 at 1/100 dilution followed by Goat Anti-Mouse IgG H&L (Alexa Fluor® 594) preadsorbed (ab150120) secondary antibody at 1/1000 dilution.

-ve control 2: Anti-COX IV antibody [mAbcam33985] - Mitochondrial Marker (ab33985) at 1/1000 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077).



Immunocytochemistry/ Immunofluorescence - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

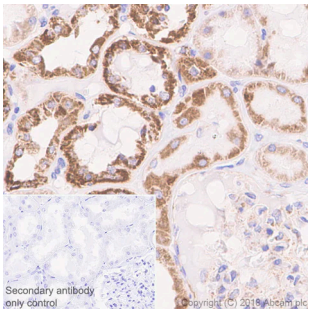
CPT1A Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-CPT1A antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized HeLa (human epithelial cell line from cervix adenocarcinoma) cells labeling CPT1A with ab220789 at 1/100 dilution followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green). Confocal image showing mitochondrial staining in HeLa cell line.
The nuclear counter stain is DAPI (blue). COX IV is detected with Anti-COX IV antibody [mAbcam33985] - Mitochondrial Marker (ab33985) at 1/1000 dilution, followed by Goat Anti-Mouse IgG H&L (Alexa Fluor® 594) preadsorbed (ab150120) (red).

The negative controls are as follows:

-ve control 1: ab220789 at 1/100 dilution followed by Goat Anti-Mouse IgG H&L (Alexa Fluor® 594) preadsorbed (ab150120) secondary antibody at 1/1000 dilution.

-ve control 2: Anti-COX IV antibody [mAbcam33985] - Mitochondrial Marker (ab33985) at 1/1000 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077).



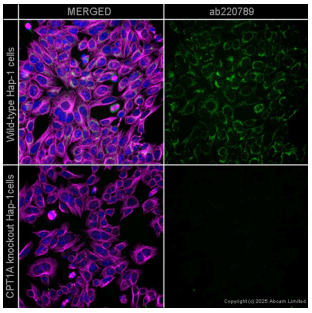
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

CPT1A Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-CPT1A antibody

Immunohistochemical analysis of paraffin-embedded human kidney tissue labeling CPT1A with ab220789 at 1/1000 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) Ready to use. Granular

cytoplasmic staining in human kidney (PMID: 18192268; PMID: 28956034). 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.

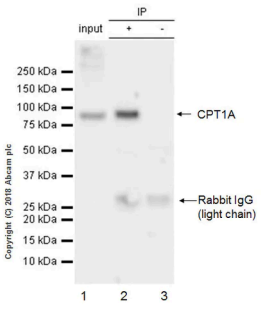
Perform heat mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.



Immunocytochemistry/ Immunofluorescence - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

CPT1A Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-CPT1A antibody

Immunofluorescent analysis of 100% methanol-fixed-fixed 0.1%, Triton X-100 permeabilized Hap1 WT and Hap1-CPT1A KO cells labelling CPT1A protein with ab220789 at 0.2 µg/ml concentration followed by ab150081 Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed antibody at 1/1000 (2 µg/ml dilution (Green). Image showing mitochodrial staining in Hap1 WT cell line. ab7291 Anti-alpha Tubulin antibody [DM1A] was used to counterstain tubulin at 1/1000 dilution (Magenta). The nuclear counterstain was DAPI (Blue).



Immunoprecipitation - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

CPT1A was immunoprecipitated from 0.35 mg of SK-OV-3 (human ovarian cancer cell line) whole cell lysate with ab220789 at 1/30 dilution. Western blot was performed from the immunoprecipitate using ab220789 at 1/1000 dilution. VeriBlot for IP Detection Reagent (HRP) (ab131366), was used for detection at 1/5000 dilution.
Lane 1: SK-OV-3 whole cell lysate 10 µg (Input).

Lane 2: ab220789 IP in SK-OV-3 whole cell lysate.

Lane 3: Rabbit monoclonal IgG (ab172730) instead of ab220789 in SK-OV-3 whole cell lysate.

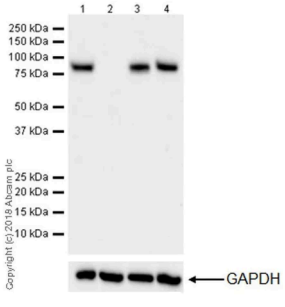
Blocking and dilution buffer and concentration: 5% NFDM/TBST.

Exposure time: 30 seconds.

All lanes:
Immunoprecipitation - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

Predicted band size: 88 kDa

Observed band size: 88 kDa



Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

CPT1A Western blot staining using rabbit Anti-CPT1A antibody

Blocking/Dilution buffer: 5% NFDM/TBST.
ab220789 was shown to specifically react with CPT1A in wild-type HAP1 cells as signal was lost in CPT1A knockout cells. Wild-type and CPT1A knockout samples were subjected to SDS-PAGE. ab220789 and ab181602 (Rabbit anti-GAPDH loading control) were incubated 1 hour at room temperature at 1/5000 dilution and 1/200,000 dilution respectively. Blots were developed with Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated (ab97051) secondary antibody at 1/100,000

dilution for 1 hour at room temperature before imaging. The blot was developed on a BIO-RAD® ChemiDoc™ MP instrument using the ECL technique.
All lanes:
Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789) at 1/5000 dilution

Lane 1:
Wild-type HAP1 whole cell lysate at 20 µg

Lane 2:
CPT1A knockout HAP1 whole cell lysate at 20 µg

Lane 3:
HeLa (human epithelial cell line from cervix adenocarcinoma) whole cell lysate at 20 µg

Lane 4:
SK-OV-3 (human ovarian cancer cell line) whole cell lysate at 20 µg

Secondary

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

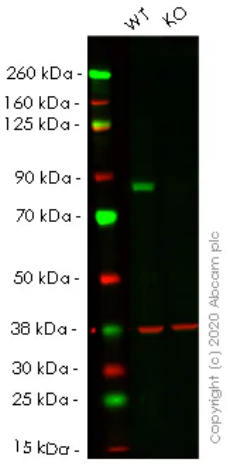
Developed using the ECL technique.

Predicted band size: 88 kDa

Observed band size: 88 kDa

Exposure time: 92s

Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)



CPT1A Western blot staining using rabbit Anti-CPT1A antibody

Lanes 1- 2: Merged signal (red and green). Green - ab220789 observed at 88 kDa. Red - Anti-GAPDH antibody [6C5] - Loading Control (ab8245) observed at 37 kDa.
ab220789 was shown to react with CPT1A in wild-type HEK-293T cells in western blot. Loss of signal was observed when knockout cell line ab266319 (knockout cell lysate ab256880) was used. Wild-type HEK-293T and CPT1A knockout HEK-293T cell lysates were subjected to SDS-PAGE. Membrane was blocked for 1 hour at room temperature in 0.1% TBST with 3% non-fat dried milk. ab220789 and Anti-GAPDH antibody [6C5] - Loading Control (ab8245) overnight at 4°C at a 1 in 1000 dilution and a 1 in 20000 dilution respectively. Blots were developed with Goat anti-Rabbit IgG H&L (IRDye®800CW) preadsorbed (ab216773) and Goat anti-Mouse IgG H&L (IRDye®680RD) preadsorbed (ab216776) secondary antibodies at 1 in 20000 dilution for 1 hour at room temperature before imaging.

All lanes:
Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789) at 1/1000 dilution

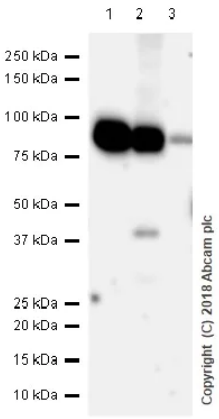
Lane 1:
Wild-type HEK-293T cell lysate at 20 µg

Lane 2:
Western blot - Human CPT1A knockout HEK-293T cell lysate (ab256880) at 20 µg

Performed under reducing conditions.

Predicted band size: 88 kDa

Observed band size: 88 kDa



Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

Blocking and diluting buffer and concentration: 5% NFDM /TBST. CPT1A is strongly expressed in kidney and heart, and lower in liver and skeletal muscle. We recommend loading higher amount of lysate or using lower antibody dilution to detect signal in HepG2 lysate.
All lanes:
Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789) at 1/1000 dilution

Lane 1:
MCF7 (Human breast adenocarcinoma epithelial cell) cell lysate at 20 µg

Lane 2:
HeLa (Human cervix adenocarcinoma epithelial cell) cell lysate at 20 µg

Lane 3:
HepG2 (Human hepatocellular carcinoma epithelial cell) cell lysate at 20 µg

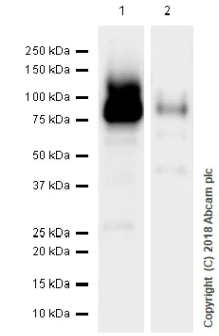
Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/20000 dilution

Predicted band size: 88 kDa

Observed band size: 88 kDa

Exposure time: 180s



Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

Blocking and diluting buffer and concentration: 5% NFDM/TBST. CPT1A is strongly expressed in kidney and heart, and lower in liver and skeletal muscle. We recommend loading higher amount of lysate or using lower antibody dilution to detect signal in liver lysate.
All lanes:
Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789) at 1/1000 dilution

Lane 1:
Human kidney tissue lysate at 20 µg

Lane 2:
Human liver tissue lysate at 20 µg

Secondary

All lanes:
Western blot - VeriBlot for IP Detection Reagent (HRP) (ab131366) at 1/1000 dilution

Predicted band size: 88 kDa

Observed band size: 88 kDa

Exposure time: 92s



Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789)

Blocking/Dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-CPT1A antibody [EPR21843-71-1C] (ab220789) at 1/1000 dilution

Lane 1:
His-tagged human CPT1A recombinant protein (aa406-755) at 0.02 µg

Lane 2:
His-tagged human CPT1B recombinant protein (aa407-756) at 0.02 µg

Secondary

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

Developed using the ECL technique.

Predicted band size: 88 kDa

Observed band size: 38 kDa

Exposure time: 10s

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