abcam

ab128929

Anti-ACAA2 antibody [EPR6732(2)]

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	EPR6732(2)
Purification technique	Affinity purification Protein A
Dissociation constant	7.1×10^{-11} M
Concentration	0.587 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	1/50 - 1/100
Notes	Use of an HRP/AP polymerized secondary antibody recommended.

IP

Not recommended

Species	Human
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	1/1000 - 1/10000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/250 - 1/500
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.

Target data

See full target information 3-ketoacyl-CoA thiolase, mitochondrial

Function	In the production of energy from fats, this is one of the enzymes that catalyzes the last step of the mitochondrial beta-oxidation pathway, an aerobic process breaking

down fatty acids into acetyl-CoA (Probable). Using free coenzyme A/CoA, catalyzes the thiolytic cleavage of medium- to long-chain unbranched 3-oxoacyl-CoAs into acetyl-CoA and a fatty acyl-CoA shortened by two carbon atoms (Probable). Also catalyzes the condensation of two acetyl-CoA molecules into acetoacetyl-CoA and could be involved in the production of ketone bodies (Probable). Also displays hydrolase activity on various fatty acyl-CoAs (PubMed:25478839). Thereby, could be responsible for the production of acetate in a side reaction to beta-oxidation (Probable). Abolishes BNIP3-mediated apoptosis and mitochondrial damage (PubMed:18371312).

Storage

Shipped at conditions	Conditional Ambient
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

Species reactivity
Mouse, Rat: We have preliminary internal testing data to indicate this antibody may not react with these species. Please contact us for more information.

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	ACAA2 also known as acetyl-CoA acyltransferase 2 or 3-ketoacyl-CoA thiolase plays an important role in the mechanical process of fatty acid oxidation. It functions in the mitochondria where it catalyzes the final step of the beta-oxidation pathway facilitating the conversion of acetoacetyl-CoA to two molecules of acetyl-CoA. This protein has a known mass of approximately 43 kDa. ACAA2 is expressed in tissues with high energy demands such as the liver heart and muscle highlighting its significance in energy metabolism.
Biological function summary	The enzyme catalyzes reactions in energy metabolism by breaking down fatty acids to generate energy. ACAA2 functions as part of the complex mitochondrial fatty acid beta-oxidation machinery. This process supports energy production particularly under conditions of carbohydrate depletion. The production of acetyl-CoA by ACAA2 is important for the TCA cycle through which cells generate ATP the primary energy carrier.
Pathways	Acetyl-CoA acyltransferase 2 plays significant roles in both the fatty acid beta-oxidation and ketogenesis pathways. In the beta-oxidation pathway it works together with other enzymes like CPT1A and HADHB to efficiently break down fatty acids. In ketogenesis acetyl-CoA units produced by ACAA2 are directed towards the formation of ketone bodies which serve as an alternative energy source for the brain and muscles during fasting or prolonged exercise.
Associated diseases and disorders	ACAA2 has connections to metabolic disorders particularly fatty acid oxidation disorders and diabetes. Deficiency in ACAA2 activity can result in accumulation and impaired degradation of fatty acids leading to metabolic imbalances. This enzyme also interacts with related proteins such as ACADM in the context of these metabolic diseases. Disruptions in ACAA2 function can face links to mitochondrial dysfunctions that contribute to diabetes due to its role in energy production and regulation.

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

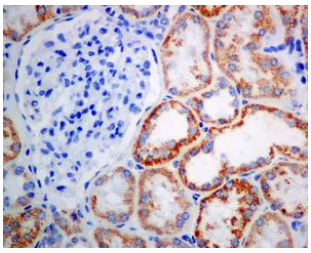
We do not recommend this combination. It is not covered by our product promise.

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.

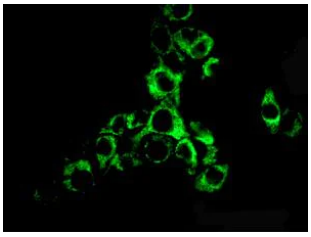
6 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-ACAA2 antibody [EPR6732(2)] (ab128929)

ACAA2 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-ACAA2 antibody

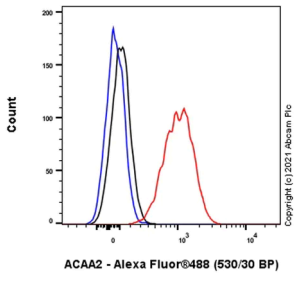
ab128929, at a 1/50 dilution, staining Human ACAA2 in kidney, using Immunohistochemistry, Formalin/PFA-fixed paraffin-emebedded tissue.
Perform heat mediated antigen retrieval via the pressure cooker method before commencing with IHC staining protocol.



Immunocytochemistry/ Immunofluorescence - Anti-ACAA2 antibody [EPR6732(2)] (ab128929)

ACAA2 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-ACAA2 antibody

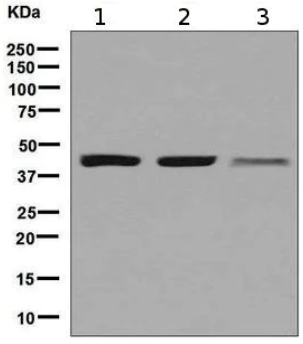
ab128929, at a 1/250 dilution, staining Human ACAA2 in HepG2 cells, using Immunofluorescence.



Flow Cytometry (Intracellular) - Anti-ACAA2 antibody [EPR6732(2)] (ab128929)

ACAA2 Flow Cytometry (Intracellular) staining using rabbit Anti-ACAA2 antibody

Flow Cytometry analysis of RPMI-8226 (Human plasmacytoma, myeloma B Lymphocyte) cells labeling ACAA2 with purified ab128929 at 1/100 dilution (10 µg/mL) (Red). Cells were fixed with 4% Paraformaldehyde and permeabilised with 90% Methanol. A Goat anti rabbit IgG (Alexa Fluor® 488, ab150077) secondary antibody was used at 1/2000. Isotype control - Rabbit monoclonal IgG (Black). Unlabeled control - Cell without incubation with primary antibody and secondary antibody (Blue).



Western blot - Anti-ACAA2 antibody [EPR6732(2)] (ab128929)

ACAA2 Western blot staining using rabbit Anti-ACAA2 antibody

All lanes:
Western blot - Anti-ACAA2 antibody [EPR6732(2)] (ab128929) at 1/1000 dilution

Lane 1:
HeLa cell lysate at 10 µg

Lane 2:

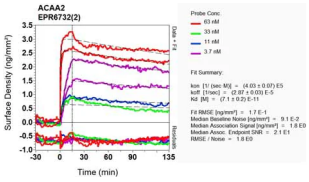
Caco-2 cell lysate at 10 µg

Lane 3:
HepG2 cell lysate at 10 µg

Secondary

All lanes:
HRP labelled goat anti-rabbit at 1/2000 dilution

Predicted band size: 41 kDa



OI-RD Scanning - Anti-ACAA2 antibody [EPR6732(2)] (ab128929)

We have systematically measured KD (the equilibrium dissociation constant between the antibody and its antigen), of more than 840 recombinant antibodies to assess not only their individual KD values but also to see the average affinity of antibody. Based on the comparison with published literature values for mouse monoclonal antibodies, Recombinant antibodies appear to be on average 1-2 order of magnitude higher affinity.

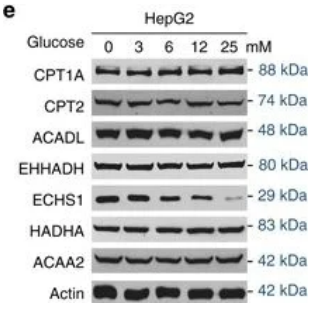


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Western blot - Anti-ACAA2 antibody [EPR6732(2)] (ab128929)

ACAA2 Western blot staining using rabbit Anti-ACAA2 antibody

ACAA2 western blot using anti-ACAA2 antibody [EPR6732(2)] ab128929. Publication image and figure legend from Zhang, Y. K., Qu, Y. Y., et al., 2017, Nat Commun, PubMed 28878358.

ab128929 was used in this publication in western blot. This may not be the same as the application(s) guaranteed by Abcam. For a full list of applications guaranteed by Abcam for ab128929 please see the product overview.

ECHS1 protein levels are decreased by nutrients. a Schematic diagram of catabolic pathways of FA (black-colored) and BCAA (red-colored) oxidation that involve ECHS1. Long chain FAs are oxidized to short-chained intermediates prior to being completely oxidized through ECHS1. BCAAs are oxidized through ECHS1. ACADL acyl-CoA dehydrogenase, long chain, ACADM medium-chain specific acyl-CoA dehydrogenase, mitochondrial, ACADS short-chain specific acyl-CoA dehydrogenase, ACSL acyl-CoA synthetase long-chain, BCAT branched-chain amino-acid transaminase, BCKDH branched-chain keto acid dehydrogenase, carnitine palmitoyltransferase, ECHS1 enoyl CoA hydratase, short chain 1, mitochondrial, EHHADH Enoyl-CoA, Hydratase/3-Hydroxyacyl CoA Dehydrogenase. b–d Endogenous ECHS1 levels were detected in HEK293T cells treated with different concentrations of glucose (b), FAs (linoleic acid + palmitic acid) (c), and amino acids (glutamate + aspartate) (d). Representative western blot results and quantitation (herein after) of triplicated western blot are shown. e HepG2 cells were exposed to indicated concentrations of glucose. Levels of endogenous β-oxidation enzymes were detected 4 h after glucose exposure. CPT1A Carnitine O-palmitoyltransferase 1, liver isoform, Carnitine O-palmitoyltransferase 2, mitochondrial, HADHA Trifunctional enzyme subunit alpha, mitochondrial, ACAA2 3-ketoacyl-CoA thiolase, mitochondrial. f Plasma ECHS1 levels of normal people (blue, n = 14) and untreated patients with diabetes (red, n = 12) were determined by western blots. Relative ECHS1 levels (normalized to the average ECHS1 level) were plotted against serum glucose levels. g Mitochondria of HEK293T cells cultured in DMEM base, DMEM base supplemented with glucose (25 mM), fatty acids (250 nM) and amino acids (8 mM), respectively, were isolated and the relative (to SOD2 and TOM40) mitochondrial ECHS1 levels were compared. For b–d, mean values of quantitation with SD are reported. *p < 0.05; **p < 0.01; ***p < 0.001

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