abcam

ab231694

Anti-CAD antibody [EP710Y] - BSA and Azide free

Recombinant | RabMAb

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	EP710Y
Purification technique	Affinity purification Protein A
Specificity	This antibody is specific to the N-terminus of CAD.
Concentration	1.031 - 1.039 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

ICC/IF

Tested

Species	Human
Dilution info	-

Notes	-

IP

Tested

Species	Human
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	-
Notes	-

Target data

See full target information CAD protein

Function	Multifunctional protein that encodes the first 3 enzymatic activities of the de novo pyrimidine pathway: carbamoylphosphate synthetase (CPSase; EC 6.3.5.5), aspartate transcarbamylase (ATCase; EC 2.1.3.2) and dihydroorotase (DHOase; EC 3.5.2.3). The CPSase-function is accomplished in 2 steps, by a glutamine-dependent amidotransferase activity (GATase) that binds and cleaves glutamine to produce ammonia, followed by an ammonium-dependent carbamoyl phosphate synthetase, which reacts with the ammonia, hydrogencarbonate and ATP to form carbamoyl phosphate. The endogenously produced carbamoyl phosphate is sequestered and channeled to the ATCase active site. ATCase then catalyzes the formation of carbamoyl-L-aspartate from L-aspartate and carbamoyl phosphate. In the last step, DHOase catalyzes the cyclization of carbamoyl aspartate to dihydroorotate.

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

ab231694 is the carrier-free version of ab40800.

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.

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 CAD protein also known as carbamoyl-phosphate synthase 2/ aspartate transcarbamylase/ dihydroorotase serves an important mechanical role in pyrimidine biosynthesis. CAD is a multi-functional enzyme with a molecular mass of approximately 243 kDa and is expressed in the cytoplasm of many cell types. This complex protein organization enables it to catalyze the first three steps of de novo pyrimidine synthesis involving glutamine-dependent carbamoyl phosphate synthesis aspartate transcarbamylation and dihydroorotase activity. Such vital tasks establish CAD as an important player in the nucleotide biosynthesis landscape.
Biological function summary	The CAD enzyme facilitates the production of pyrimidine nucleotides that are necessary for DNA and RNA synthesis. CAD operates as a single-polypeptide chain trifunctional enzyme and is part of a larger protein complex involved in nucleic acid metabolism. Its enzymatic activities align closely to support cellular proliferation and differentiation processes that demand efficient nucleotide production. This link between CAD function and nucleotide availability underlines its importance in ensuring smooth cell cycle progression and maintenance.
Pathways	CAD integrates into the broader nucleotide metabolism and pyrimidine biosynthesis pathways. The CAD protein directly interacts with other key enzymes such as UMP synthase which furthers the conversion of its product dihydroorotate to UMP. OMP decarboxylase also acts downstream reflecting CAD's role in ensuring continuity and efficiency in pyrimidine synthesis. These interactions demonstrate CAD's central involvement in maintaining the nucleotide pool required for DNA synthesis and repair.
Associated diseases and disorders	CAD mutations and dysregulations link to neurological disorders and cancer. Neurological conditions such as CAD deficiency can result from impaired pyrimidine synthesis affecting brain development and function. Additionally enhanced CAD activity associates with certain cancers where its upregulated pyrimidine production supports rapid tumor cell proliferation. In these disease contexts CAD's interaction with proteins involved in cellular proliferation pathways such as c-Myc in cancers highlights its impact on health and disease states.

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

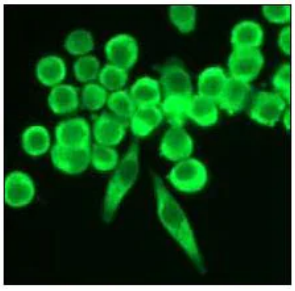
We do not recommend this combination. It is not covered by our product promise.

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.

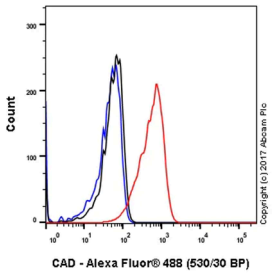
8 product images



Immunocytochemistry/ Immunofluorescence - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

CAD Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-CAD antibody

This data was developed using ab40800, the same antibody clone in a different buffer formulation.Unpurified ab40800 (1/100), staining human CAD (N-term) in HeLa cells by Immunofluorescence.

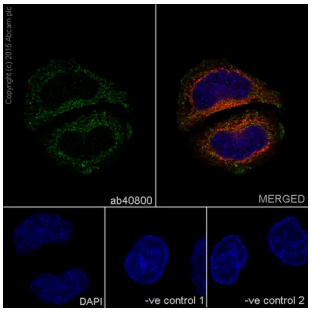


Flow Cytometry (Intracellular) - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

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

This data was developed using ab40800, the same antibody clone in a different buffer formulation.

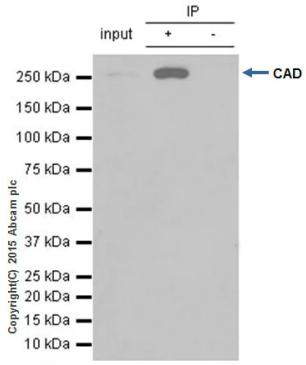
Intracellular Flow Cytometry analysis of HeLa (human cervix adenocarcinoma) cells labeling CAD (red) with ab40800 at a 1/120 dilution. Cells were fixed with 4% paraformaldehyde and permeabilized with 90% methanol. A goat anti-rabbit IgG (Alexa Fluor® 488) (ab150077) was used as the secondary antibody at a 1/2000 dilution. Black - Rabbit monoclonal IgG (ab172730). Blue (unlabeled control) - Cells without incubation with the primary and secondary antibodies.



Immunocytochemistry/ Immunofluorescence - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

CAD Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-CAD antibody

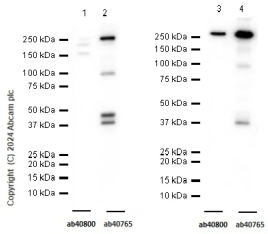
This data was developed using ab40800, the same antibody clone in a different buffer formulation. Immunofluorescence staining of HeLa cells with purified ab40800 at a working dilution of 1/300, counter-stained with DAPI. The secondary antibody was Alexa Fluor® 488 goat anti-rabbit (ab150077), used at a dilution of 1/1000. ab7291, a mouse anti-tubulin antibody (1/1000), was used to stain tubulin along with ab150120 (Alexa Fluor® 594 goat anti-mouse, 1/1000), shown in the top right hand panel. The cells were fixed in 4% PFA and permeabilized using 0.1% Triton X 100. The negative controls are shown in bottom middle and right hand panels - for negative control 1, purified ab40800 was used at a dilution of 1/500 followed by an Alexa Fluor® 594 goat anti-mouse antibody (ab150120) at a dilution of 1/500. For negative control 2, ab7291 (mouse anti-tubulin) was used at a dilution of 1/500 followed by an Alexa Fluor® 488 goat anti-rabbit antibody (ab150077) at a dilution of 1/400.



Immunoprecipitation - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

This data was developed using ab40800, the same antibody clone in a different buffer formulation.ab40800 (purified) at 1/30 immunoprecipitating CAD in 10 µg HeLa (Lanes 1 and 2, observed at 250 kDa). Lane 3 - PBS. For western blotting, HRP Veriblot for IP (ab131366) was used for detection (1/10 000). Blocking buffer and concentration: 5% NFDM/TBST Dilution buffer and concentration: 5% NFDM/TBST
All lanes:
Immunoprecipitation - Anti-CAD antibody [EP710Y] (ab40800)

Predicted band size: 243 kDa



Western blot - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

This data was developed using ab40800, the same antibody clone in a different buffer formulation.

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

ab40765 works better than ab40800 in western blot testing.

We suggest optimizing experimental protocols (increasing lysate amount, using lower dilution or higher sensitivity ECL substrate) to improve results when using ab955 in western blot.

Lanes 1 and 3:
Western blot - Anti-CAD antibody [EP710Y] (ab40800) at 1/1000 dilution

Lanes 2 and 4:
Western blot - Anti-CAD antibody [EP711Y] (ab40765) at 1/1000 dilution

Lanes 1 - 2:
NCI-H1299 (human lung carcinoma epithelial cell) whole cell lysate at 20 µg

Lanes 3 - 4:
HeLa (human cervix adenocarcinoma epithelial cell) whole cell lysate at 20 µg

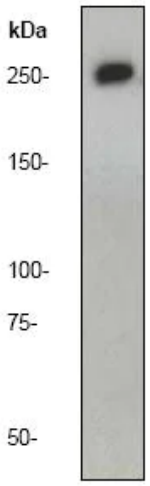
Secondary

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

Predicted band size: 243 kDa

Observed band size: 250 kDa

Exposure time: 10s



Western blot - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

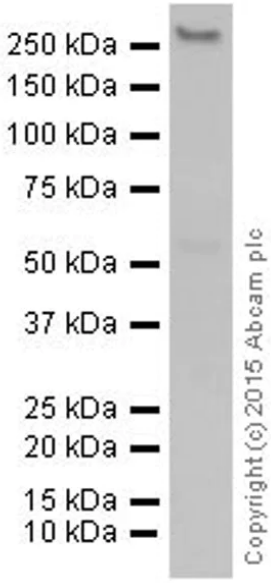
CAD Western blot staining of HEK-293 whole cell lysate using rabbit Anti-CAD antibody

This data was developed using ab40800, the same antibody clone in a different buffer formulation.
All lanes:
Western blot - Anti-CAD antibody [EP710Y] (ab40800) at 1/1000 dilution

All lanes:
Western blot - HEK-293 whole cell lysate (ab7902) at 10 µg

Predicted band size: 243 kDa

Observed band size: 250 kDa



Western blot - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

This data was developed using ab40800, the same antibody clone in a different buffer formulation.
Blocking and dilution buffer: 5% NFDM/TBST.

All lanes:
Western blot - Anti-CAD antibody [EP710Y] (ab40800) at 1/1000 dilution

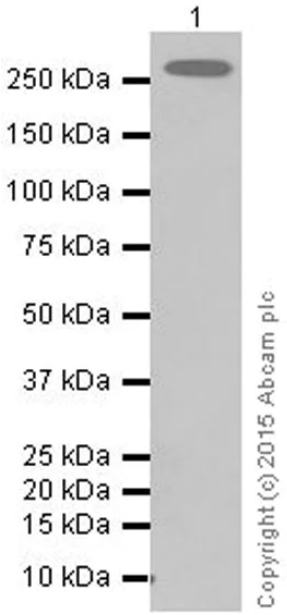
All lanes:
HeLa cell lysate at 1/20000 dilution

Secondary

All lanes:
HRP goat anti-rabbit IgG (H+L) at 1/20000 dilution

Predicted band size: 243 kDa

Observed band size: 250 kDa



Western blot - Anti-CAD antibody [EP710Y] - BSA and Azide free (ab231694)

CAD Western blot staining of HeLa cell lysate using rabbit Anti-CAD antibody

This data was developed using ab40800, the same antibody clone in a different buffer formulation.
Blocking and dilution buffer: 5% NFDM/TBST.

All lanes:
Western blot - Anti-CAD antibody [EP710Y] (ab40800) at 1/2000 dilution

All lanes:
HeLa cell lysate at 10 µg

Secondary

All lanes:
HRP goat anti-rabbit IgG (H+L) at 1/20000 dilution

Predicted band size: 243 kDa

Observed band size: 250 kDa

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