abcam

ab28947

Anti-NQO1 antibody [A180]

KO Validated

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	pH: 7.4 Preservative: 0.02% Sodium azide Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	The exact immunogen used to generate this antibody is proprietary information.
Clone number	A180
Purification technique	Affinity purification
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

ICC/IF

Tested

Species	Human
Dilution info	5 µg/mL
Notes	-

Predicted

Species	Mouse, Rat, Dog, Monkey
Dilution info	-
Notes	-

Not recommended

Species	Recombinant full length protein
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1 µg for 10^6 Cells
Notes	ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Predicted

Species	Mouse, Rat, Dog, Monkey
Dilution info	-
Notes	-

Not recommended

Species	Recombinant full length protein
Dilution info	-
Notes	-

WB

Tested

Species	Human

Dilution info	1 µg/mL
Notes	-

Predicted

Species	Mouse, Rat, Dog, Monkey
Dilution info	-
Notes	-

Not recommended

Species	Recombinant full length protein
Dilution info	-
Notes	-

sELISA

Tested

Species	Recombinant full length protein
Dilution info	1/500
Notes	Can be used as capture antibody in conjunction with ab34173 as detection antibody.

Expected

Species	Human
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mouse, Rat, Dog, Monkey
Dilution info	-
Notes	-

IHC-P

Tested

Species	Human
Dilution info	-
Notes	-

Predicted

Species	Mouse, Rat, Dog, Monkey
Dilution info	-
Notes	-

Not recommended

Species	Recombinant full length protein
Dilution info	-
Notes	-

Target data

See full target information NQO1

Function

Flavin-containing quinone reductase that catalyzes two-electron reduction of quinones to hydroquinones using either NADH or NADPH as electron donors. In a ping-pong kinetic mechanism, the electrons are sequentially transferred from NAD(P)H to flavin cofactor and then from reduced flavin to the quinone, bypassing the formation of semiquinone and reactive oxygen species (By similarity) (PubMed:8999809, PubMed:9271353). Regulates cellular redox state primarily through quinone detoxification. Reduces components of plasma membrane redox system such as coenzyme Q and vitamin quinones, producing antioxidant hydroquinone forms. In the process may function as superoxide scavenger to prevent hydroquinone oxidation and facilitate excretion (PubMed:15102952, PubMed:8999809, PubMed:9271353). Alternatively, can activate quinones and their derivatives by generating redox reactive hydroquinones with DNA cross-linking antitumor potential (PubMed:8999809). Acts as a gatekeeper of the core 20S proteasome known to degrade proteins with unstructured regions. Upon oxidative stress, interacts with tumor suppressors TP53 and TP73 in a NADH-dependent way and inhibits their ubiquitin-independent degradation by the 20S proteasome (PubMed:15687255, PubMed:28291250).

Storage

Shipped at conditions	Blue Ice
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

Want a custom formulation?
This antibody clone is manufactured by Abcam. If you require a custom buffer formulation or conjugation for your experiments, please contact orders@abcam.com

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	NQO1 also known as NAD(P)H:quinone oxidoreductase 1 is a cytosolic enzyme involved in two-electron reduction processes. This protein plays a role in detoxification transforming quinones into less reactive and harmful hydroquinones. NQO1 has a molecular weight of approximately 31 kDa and is present in various tissues with high expression in the liver and lungs. Sometimes called DT-diaphorase it contributes to antioxidant protection within cells and assists in the stabilization of other proteins such as p53.
Biological function summary	NQO1 serves a protective function against oxidative stress by reducing quinones and preventing redox cycling that generates reactive oxygen species. Part of a critical network its function integrates with the cellular defense mechanism assisting in maintaining cellular homeostasis. NQO1 helps metabolize xenobiotics and is associated with phase II detoxification working alongside enzymes like glutathione S-transferases but is not part of a complex.
Pathways	NQO1 is an important component of the antioxidant defense pathway participating in the direct enzymatic reduction of quinones protecting cells from oxidative damage. It also interfaces with the KEAP1-NRF2 pathway where the NQO1 gene is regulated by the NRF2 transcription factor that upregulates its expression in response to oxidative stress. NQO1 interlinks with proteins such as p53 through pathways related to apoptotic regulation and cellular stress responses.

Associated diseases and disorders	Mutations or altered expression of NQO1 have correlations with cancer development and progression notably in liver and lung cancers. This protein's stability influences cancer cell survival particularly under oxidative stress or chemotherapeutic treatments. NQO1 also exhibits links to Alzheimer's disease where its potential role in neuroprotection against oxidative damage draws investigation relating it to proteins like tau and amyloid-beta.

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

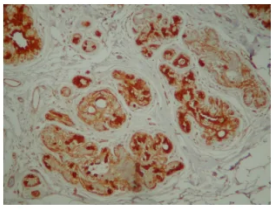
We do not recommend this combination. It is not covered by our product promise.

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.

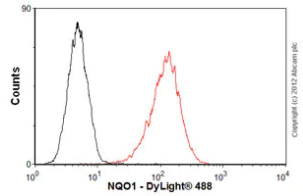
10 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-NQO1 antibody [A180] (ab28947)

NQO1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-NQO1 antibody

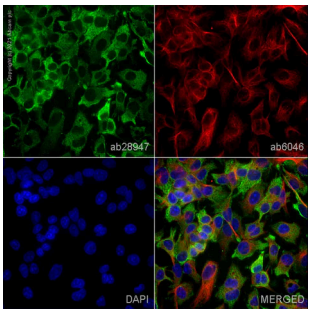
Human breast cancer tissue stained with ab28947 NQO1 antibody.



Flow Cytometry (Intracellular) - Anti-NQO1 antibody [A180] (ab28947)

NQO1 Flow Cytometry (Intracellular) staining using mouse Anti-NQO1 antibody

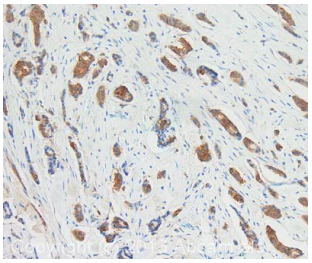
Overlay histogram showing HeLa cells stained with ab28947 (red line). The cells were fixed with 80% methanol (5 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab28947, 1µg/1x10^6 cells) for 30 min at 22°C. The secondary antibody used was goat anti-mouse DyLight® 488 (IgG H+L) (ab96879) at 1/500 dilution for 30 min at 22°C. Isotype control antibody (black line) was mouse IgG1 [ICIGG1] (ab91353, 2µg/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was performed.



Immunocytochemistry/ Immunofluorescence - Anti-NQO1 antibody [A180] (ab28947)

NQO1 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-NQO1 antibody

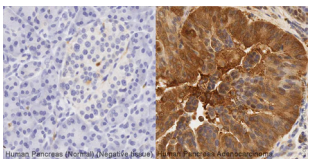
ab28947 staining NQO1 in HepG2 cells. The cells were fixed with 100% methanol (5 min), permeabilized with 0.1% PBS-Tween for 5 minutes and then blocked with 1% BSA/10% normal goat serum/0.3M glycine in 0.1%PBS-Tween for 1h. The cells were then incubated overnight at 4°C with ab28947 at 5µg/ml and ab6046, Rabbit polyclonal to beta Tubulin - Loading Control. Cells were then incubated with ab150117, Goat polyclonal Secondary Antibody to Mouse IgG H&L (Alexa Fluor® 488) preadsorbed at 1/1000 dilution (shown in green) and ab150080, Goat polyclonal Secondary Antibody to Rabbit IgG - H&L (Alexa Fluor® 594) at 1/1000 dilution (shown in pseudocolour red). Nuclear DNA was labelled with DAPI (shown in blue).
Image was acquired with a high-content analyser (Operetta CLS, Perkin Elmer) and a maximum intensity projection of confocal sections is shown.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-NQO1 antibody [A180] (ab28947)

NQO1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-NQO1 antibody

IHC image of NQO1 staining in human breast adenocarcinoma formalin fixed paraffin embedded tissue section, performed on a Leica Bond system using the standard protocol F. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH6, epitope retrieval solution 1) for 20 mins. The section was then incubated with ab28947, 0.1µg/ml, for 15 mins at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX.
For other IHC staining systems (automated and non-automated) customers should optimize variable parameters such as antigen retrieval conditions, primary antibody concentration and antibody incubation times.

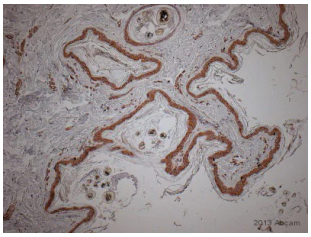


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-NQO1 antibody [A180] (ab28947)

NQO1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-NQO1 antibody

IHC image of NQO1 staining in sections of formalin fixed paraffin embedded normal human pancreas* (left) and human pancreas adenocarcinoma* (right), performed on a Leica BOND™ system using the standard protocol F. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH6, epitope retrieval solution 1) for 20 mins. The section was then incubated with ab28947, 0.1µg/ml, for 15 mins at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX.
For other IHC staining systems (automated and non-automated) customers should optimize variable parameters such as antigen retrieval conditions, primary antibody concentration and antibody incubation times.

** Tissue obtained from the Human Research Tissue Bank, supported by the NIHR Cambridge Biomedical Research Centre*



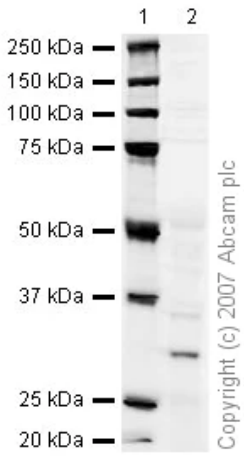
This image is courtesy of an anonymous customer review

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-NQO1 antibody [A180] (ab28947)

NQO1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-NQO1 antibody

Immunohistochemical analysis of dog skin tissue, staining NQO1 with ab28947.

Tissue was fixed with formaldehyde and antigen retrieval was by heat mediation in a citrate buffer (pH 6). Samples were incubated with primary antibody (1/175 in BSA in TBS) for 45 minutes. ab98784 rabbit polyclonal to anti-mouse HRP (IgG) (1/500) was used as the secondary antibody.



Western blot - Anti-NQO1 antibody [A180] (ab28947)

Lane 1:
Marker

Lane 2:
Western blot - Anti-NQO1 antibody [A180] (ab28947) at 1 µg/mL

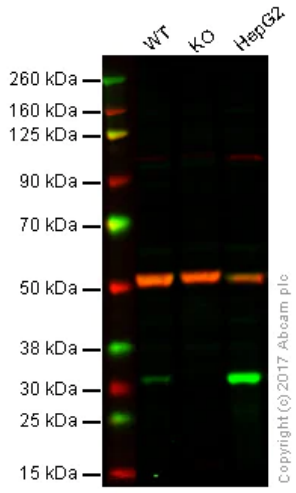
All lanes:
Kidney (Human) Tissue Lysate (ab7920) at 20 µg

Secondary

All lanes:
IRDye 680 Conjugated Goat Anti-Mouse IgG (H+L) at 1/10000 dilution

Predicted band size: 31 kDa

Observed band size: 30 kDa



Western blot - Anti-NQO1 antibody [A180] (ab28947)

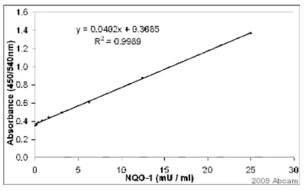
NQO1 Western blot staining using mouse Anti-NQO1 antibody

Lane 1: Wild-type HAP1 whole cell lysate (20 µg)
Lane 2: NQO1 knockout HAP1 whole cell lysate (20 µg)
Lane 3: HepG2 whole cell lysate (20 µg)
Lanes 1 - 3: Merged signal (red and green). Green - ab28947 observed at 31 kDa. Red - loading control, ab176560, observed at 50 kDa.

ab28947 was shown to specifically react with NQO1 in wild-type HAP1 cells as signal was lost in NQO1 knockout cells. Wild-type and NQO1 knockout samples were subjected to SDS-PAGE. ab28947 and ab176560 (Rabbit anti-alpha Tubulin loading control) were incubated overnight at 4°C at 1 µg/ml and 1/20000 dilution respectively. Blots were developed with Goat anti-Mouse IgG H&L (IRDye® 800CW) preabsorbed ab216772 and Goat anti-Rabbit IgG H&L (IRDye® 680RD) preabsorbed ab216777 secondary antibodies at 1/20000 dilution for 1 hour at room temperature before imaging.

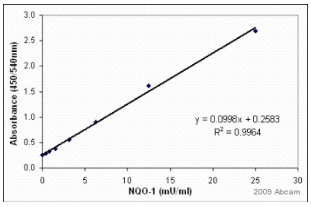
All lanes:
Western blot - Anti-NQO1 antibody [A180] (ab28947)

Predicted band size: 31 kDa



Sandwich ELISA - Anti-NQO1 antibody [A180] (ab28947)

Sandwich ELISA for the detection of NQO1, using ab28947 (1/500) as the capture antibody and ab34173 (1/1000) for the detection.



This image is courtesy of an anonymous customer review

Sandwich ELISA - Anti-NQO1 antibody [A180] (ab28947)

Sandwich ELISA for the detection of NQO1. ab28947 (1/500) was used as the capture antibody. A rabbit polyclonal raised againts the C-terminal end of NQO1 was used for the detection. Please refer to abreview for further experimental details.

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