abcam

ab227977

Anti-FOXC1 antibody [EPR20685]

Anti-FOXC1 antibody [EPR20685] (ab227977) is a rabbit monoclonal antibody detecting FOXC1 in **Western Blot, Flow Cytometry (Intra), IP, IHC-P, IHC-Fr, ICC/IF**. Suitable for **Human, Mouse**.

- KO validated for confirmed specificity
- Biophysical QC for unrivalled batch-batch consistency
- Over 10 publications

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	EPR20685
Purification technique	Affinity purification Protein A
Concentration	1.14 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IP

Tested

Species	Human
Dilution info	1/50
Notes	-

Expected

Species	Rat, Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

WB

Tested

Species	Human
Dilution info	1/1000
Notes	WB works for some mouse lysates.

Species	Rat
Dilution info	1/1000
Notes	-

Species	Mouse
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	12 µg/mL
Notes	-

Expected

Species	Rat, Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

IHC-Fr

Tested

Species	Mouse
Dilution info	1/1000
Notes	Perform heat-mediated antigen retrieval by using sodium citrate buffer (10mM citrate pH 6.0 + 0.05% Tween-20).

Expected

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

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/100
Notes	-

Expected

Species	Rat, Mouse
Dilution info	Use at an assay dependent concentration.
Notes	-

IHC-P

Tested

Species	Mouse
Dilution info	1/500
Notes	-

Species	Human
Dilution info	1/500
Notes	-

Expected

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

Target data

See full target information FOXC1

Function

DNA-binding transcriptional factor that plays a role in a broad range of cellular and developmental processes such as eye, bones, cardiovascular, kidney and skin development (PubMed:11782474, PubMed:14506133, PubMed:14578375, PubMed:15277473, PubMed:15299087, PubMed:15684392, PubMed:16449236, PubMed:16492674, PubMed:17210863, PubMed:19279310, PubMed:19793056, PubMed:25786029, PubMed:27804176, PubMed:27907090). Acts either as a transcriptional activator or repressor (PubMed:11782474). Binds to the consensus binding site 5'-[G/C][A/T]AAA[T/C]AA[A/C]-3' in promoter of target genes (PubMed:11782474, PubMed:12533514, PubMed:14506133, PubMed:19793056, PubMed:27804176, PubMed:7957066). Upon DNA-binding, promotes DNA bending (PubMed:14506133, PubMed:7957066). Acts as a transcriptional coactivator (PubMed:26565916). Stimulates Indian hedgehog (Ihh)-induced target gene expression mediated by the transcription factor GLI2, and hence regulates endochondral ossification (By similarity). Also acts as a transcriptional coregulator by increasing DNA-binding capacity of GLI2 in breast cancer cells (PubMed:26565916). Regulates FOXO1 through binding to a conserved element, 5'-GTAAACAAA-3' in its promoter region, implicating FOXC1 as an important regulator of cell viability and resistance to oxidative stress in the eye (PubMed:17993506). Cooperates with transcription factor FOXC2 in regulating expression of genes that maintain podocyte integrity (By similarity). Promotes cell growth inhibition by stopping the cell cycle in the G1 phase through TGFB1-mediated signals (PubMed:12408963). Involved in epithelial-mesenchymal transition (EMT) induction by increasing cell proliferation, migration and invasion (PubMed:20406990, PubMed:22991501). Involved in chemokine CXCL12-induced endothelial cell migration through the control of CXCR4 expression (By similarity). Plays a role in the gene regulatory network essential for epidermal keratinocyte terminal differentiation (PubMed:27907090). Essential developmental transcriptional factor

required for mesoderm-derived tissues, such as the somites, skin, bone and cartilage. Positively regulates CXCL12 and stem cell factor expression in bone marrow mesenchymal progenitor cells, and hence plays a role in the development and maintenance of mesenchymal niches for haematopoietic stem and progenitor cells (HSPC). Plays a role in corneal transparency by preventing both blood vessel and lymphatic vessel growth during embryonic development in a VEGF-dependent manner. Involved in chemokine CXCL12-induced endothelial cell migration through the control of CXCR4 expression (By similarity). May function as a tumor suppressor (PubMed:12408963).

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

What is this antibody validated in?
Anti-FOXC1 antibody [EPR20685] (ab227977) is a rabbit recombinant monoclonal antibody and is validated for use in Western Blot (WB), Flow Cytometry (Intra), Flow Cytometry (Flow Cyt), Immunoprecipitation (IP), Immunohistochemistry (IHC-P), Immunohistochemistry (IHC-Fr), Immunocytochemistry/immunofluorescence (ICC/IF) in Human, Mouse samples.

What is the molecular weight of FOXC1?
Anti-FOXC1 [EPR20685] (ab227977) specifically detects a band for FOXC1 (UniProt: Q12948) at a molecular weight of 57kDa.

Trusted by the scientific community
Anti-FOXC1 [EPR20685] (ab227977) was first used in a scientific publication in 2018 and has been cited over 10 times in peer-reviewed journals.

Specificity confirmed
The specificity of Anti-FOXC1 antibody [EPR20685] (ab227977) has been confirmed by Western blot testing in FOXC1 Knockout HEK-293 cells.

Other related products
We have a range of other formats of antibody clone [EPR20685] also available for your convenience: ab227977,

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.

Trial sizes available!
Test your antibody or perform pre-screening before committing to a larger quantity. Sold in 20µl. Discover our selection of trial-size antibodies.

Supplementary info

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

Activity summary	FOXC1 also known as Forkhead box C1 is a transcription factor with a molecular mass of approximately 56 kilodaltons. This protein belongs to the forkhead family of transcription factors which are characterized by a distinct forkhead domain. FOXC1 primarily expresses in tissues like the eye brain and kidneys. It plays an important role in regulating gene expression by binding to specific DNA sequences affecting the transcription of genes involved in a variety of cellular processes.
Biological function summary	FOXC1 plays a significant role in the development and differentiation of cells particularly in the anterior segment of the eye and in neural crest-derived tissues. Although it does not usually form part of a larger complex FOXC1 frequently interacts with other transcription factors and co-factors to modulate gene expression. It influences cell proliferation migration and apoptosis ensuring correct tissue and organ formation during development.
Pathways	FOXC1 contributes extensively to the regulation of developmental pathways particularly the Wnt signaling pathway. It also aligns with the Hedgehog signaling pathway which is well-known for its role in developmental processes. FOXC1 often interacts with related proteins such as FOXC2 another forkhead family member that helps orchestrate cellular events during development through these pathways.
Associated diseases and disorders	FOXC1 mutations or dysregulation associate with disorders such as Axenfeld-Rieger syndrome and glaucoma. These conditions highlight the importance of FOXC1 in eye development. FOXC2 often appears in discussions of these conditions due to its shared role in the pathways orchestrating developmental processes. Dysregulation of FOXC1 can also influence factors such as ECM components and signaling molecules leading to pathological changes observed in these disorders.

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

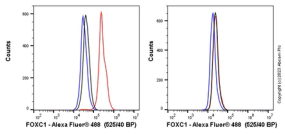
We do not recommend this combination. It is not covered by our product promise.

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.

14 product images



Flow Cytometry (Intracellular) - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Flow Cytometry (Intracellular) staining using rabbit Anti-FOXC1 antibody

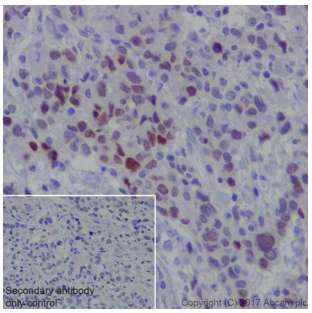
Flow cytometry overlay histogram showing left HEK293 positive cells and right negative Jurkat stained with ab227977 (red line). The cells were fixed with 80% methanol (5 min) and then permeabilised with 0.1% PBS-Triton X-100 for 15 min. The cells were then incubated in 1x PBS containing 10% normal goat serum to block non-specific protein-protein interaction followed by the antibody (ab227977) (1x 106 in 100µl at 1.0µg/ml (1/2110)) 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 (black line) was Recombinant Rabbit IgG, monoclonal [EPR25A] - Isotype Control used at the same concentration and conditions as the primary antibody. Unlabelled sample (blue line) was also used as a control.

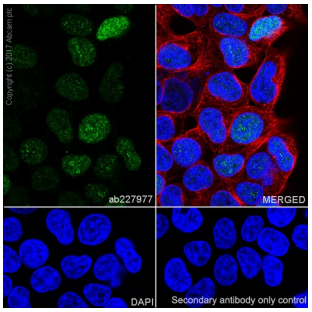
Acquisition of >5000 events were collected using a 50 mW Blue laser (488nm) and 525/40 bandpass filter.

This antibody gave a positive signal in HEK293 Fixed with 4% formaldehyde (10 min) / permeabilised with 0.1% PBS-Triton X-100 for 15 min under the same conditions.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-FOXC1 antibody [EPR20685] (ab227977)

Immunohistochemical analysis of paraffin-embedded human gastric cancer tissue labeling FOXC1 with ab227977 at 1/500 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) Ready to use. Nuclear staining in human gastric cancer (PMID:24329718). Counter stained with hematoxylin. Heat mediated antigen retrieval was performed using Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) Ready to use.

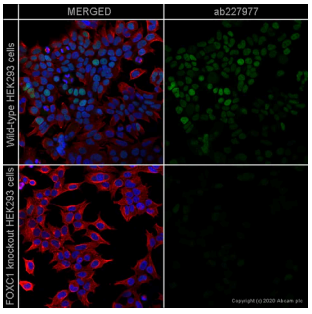


Immunocytochemistry/ Immunofluorescence - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-FOXC1 antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized HEK-293T (human epithelial cell line from embryonic kidney transformed with large T antigen) cells labeling FOXC1 with ab227977 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 nuclear staining in HEK-293T cell line.
The nuclear counter stain is DAPI (blue). Tubulin is detected with Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) (ab195889) (red) at 1/200 dilution.

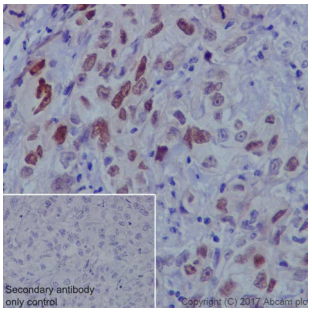
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution.



Immunocytochemistry/ Immunofluorescence - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-FOXC1 antibody

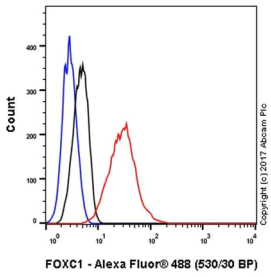
ab227977 staining FOXC1 in wild-type HEK293 cells (top panel) and FOXC1 knockout HEK293 cells (bottom panel). The cells were fixed with paraformaldehyde (10 min), permeabilized with 0.1% Triton X-100 for 5 minutes and then blocked with 1% BSA/10% normal goat serum/0.3M glycine in 0.1% PBS-Tween for 1h. The cells were then incubated with ab227977 at 12 µg/ml and ab7291 (Tubulin) at 1/1000 dilution overnight at +4°C, followed by a further incubation at room temperature for 1h with a goat secondary antibody to rabbit IgG (Alexa Fluor® 488) (ab150081) at 2 µg/ml (shown in green) and a goat secondary antibody to mouse IgG (Alexa Fluor® 594) (ab150120) at 2 µg/ml (shown in pseudo color red). Nuclear DNA was labelled in blue with DAPI.
Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-FOXC1 antibody

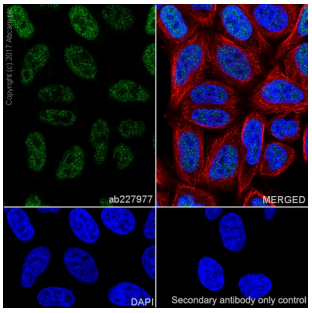
Immunohistochemical analysis of paraffin-embedded human basal-like breast cancer tissue labeling FOXC1 with ab227977 at 1/500 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) Ready to use. Nuclear staining in human basal-like breast cancer (PMID:27708239; PMID:20406990). Counter stained with hematoxylin. Heat mediated antigen retrieval was performed using Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol. Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) Ready to use.



Flow Cytometry (Intracellular) - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Flow Cytometry (Intracellular) staining using rabbit Anti-FOXC1 antibody

Intracellular flow cytometric analysis of 4% paraformaldehyde-fixed, 90% methanol-permeabilized HEK-293T (human epithelial cell line from embryonic kidney transformed with large T antigen) cell line labeling FOXC1 with ab227977 at 1/100 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.

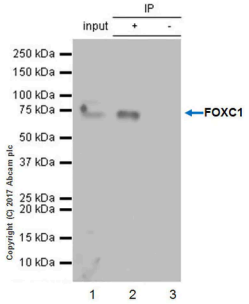


Immunocytochemistry/ Immunofluorescence - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-FOXC1 antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized HeLa (human epithelial cell line from cervix adenocarcinoma) cells labeling FOXC1 with ab227977 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 nuclear staining in HEK-293T cell line.
The nuclear counter stain is DAPI (blue). Tubulin is detected with Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) (ab195889) (red) at 1/200 dilution.

Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution.



Immunoprecipitation - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 was immunoprecipitated from 0.35 mg of HeLa (human epithelial cell line from cervix adenocarcinoma) whole cell lysate with ab227977 at 1/50 dilution. Western blot was performed from the immunoprecipitate using ab227977 at 1/1000 dilution. VeriBlot for IP Detection Reagent (HRP) (ab131366), was used for detection at 1/1000 dilution.
Lane 1: HeLa whole cell lysate 10 µg (Input).

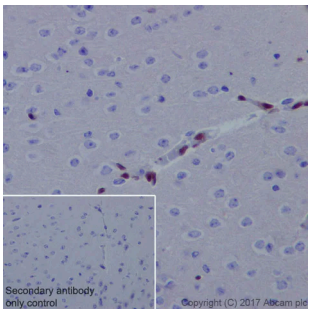
Lane 2: ab227977 IP in HeLa whole cell lysate.

Lane 3: Rabbit monoclonal IgG (ab172730) instead of ab227977 in HeLa whole cell lysate.

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

Exposure time: 10 seconds.
All lanes:
Immunoprecipitation - Anti-FOXC1 antibody [EPR20685] (ab227977)

Predicted band size: 57 kDa

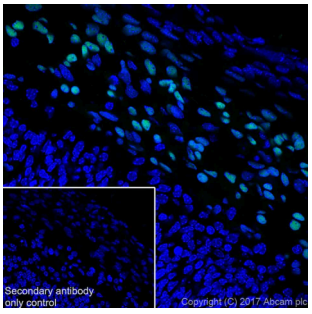


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-FOXC1 antibody

Immunohistochemical analysis of paraffin-embedded mouse cerebrum tissue labeling FOXC1 with ab227977 at 1/500 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) Ready to use. Nuclear staining in the pericytes and endothelium of blood vessels in mouse cerebrum is observed (PMID:25733312; PMID: 23862012). Counter stained with hematoxylin. Heat mediated antigen retrieval was performed using Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) Ready to use.

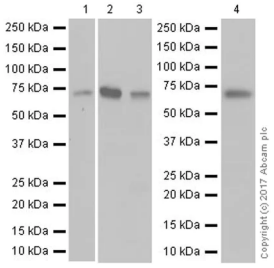


Immunohistochemistry (Frozen sections) - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Immunohistochemistry (Frozen sections) staining using rabbit Anti-FOXC1 antibody

Immunohistochemical analysis of 4% paraformaldehyde-fixed, 0.2% Triton X-100 permeabilized frozen mouse fetal brain E14.5 tissue labeling FOXC1 with ab227977 at 1/1000 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green). Positive nuclear staining localized in the meninges and adjacent cortex region on mouse fetal brain (PMID: 23862012).
The nuclear counter stain is DAPI (blue).

Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution.



Western blot - Anti-FOXC1 antibody [EPR20685] (ab227977)

Exposure time : Lanes 1 & 4: 3 minutes; Lanes 2-3: 5 seconds.

Blocking/Dilution buffer: 5% NFDM/TBST.

The molecular mass is consistent with what has been described in the literature (PMID: 27708239).

All lanes:
Western blot - Anti-FOXC1 antibody [EPR20685] (ab227977) at 1/1000 dilution

Lane 1:
MDA-MB-231 (human breast adenocarcinoma cell line) whole cell lysate at 20 µg

Lane 2:
HEK-293T (human epithelial cell line from embryonic kidney transformed with large T antigen) whole cell lysate at 20 µg

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

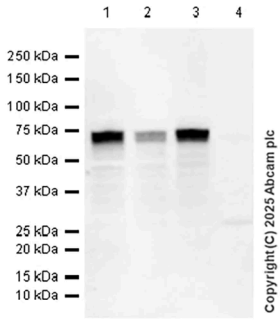
Lane 4:
Human fetal kidney lysate at 10 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/50000 dilution

Predicted band size: 57 kDa

Observed band size: 70 kDa



Western blot - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Western blot staining using rabbit Anti-FOXC1 antibody

Blocking and diluting buffer and concentration: 5% NFDM/TBST.
All lanes:
Western blot - Anti-FOXC1 antibody [EPR20685] (ab227977) at 1/1000 dilution

Lane 1:
Rat E15 brain tissue lysate at 20 µg

Lane 2:
Rat embryo tissue lysate at 20 µg

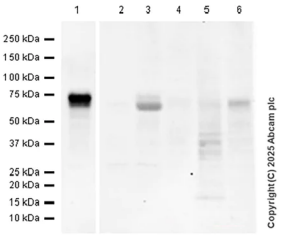
Lane 3:
Rat E18 kidney tissue lysate at 20 µg

Lane 4:
Rat kidney tissue lysate at 20 µg

Secondary

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

Observed band size: 70 kDa



Western blot - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Western blot staining using rabbit Anti-FOXC1 antibody

Blocking and diluting buffer and concentration: 5% NFDM/TBST.
All lanes:
Western blot - Anti-FOXC1 antibody [EPR20685] (ab227977) at 1/1000 dilution

Lane 1:
Mouse embryo tissue lysate at 20 µg

Lane 2:

Mouse kidney tissue lysate at 20 µg

Lane 3:
Mouse skin tissue lysate at 20 µg

Lane 4:
C2C12 (mouse myoblasts myoblast), whole cell lysate at 20 µg

Lane 5:
4T1 (mouse mammary gland carcinoma epithelial cell line) whole cell lysate at 20 µg

Lane 6:
NIH/3T3 (mouse embryo fibroblast cell line) whole cell lysate at 20 µg

Secondary

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

Observed band size: 70 kDa

D

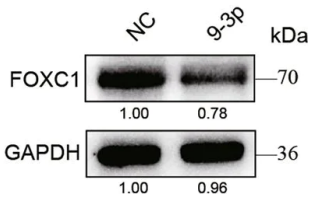


Image collected and cropped by CiteAb under a CC-BY license from the publication

Western blot - Anti-FOXC1 antibody [EPR20685] (ab227977)

FOXC1 Western blot staining using rabbit Anti-FOXC1 antibody

FOXC1 western blot using anti-FOXC1 antibody [EPR20685] ab227977. Publication image and figure legend from Bao, C., Lu, Y., et al., 2019, Cell Death Dis, PubMed 31649243.

ab227977 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 ab227977 please see the product overview.

MiR-9-3p directly targets FOXC1/FAM171A1, and miR-135b-3p directly targets RGMA.a, b The dual luciferase assays in MDA-MB-231 cells confirmed that miR-9-3p directly targets FOXC1/FAM171A1, and miR-135b-3p directly targets RGMA. c–h The mRNA and protein levels of FOXC1, FAM171A1 and RGMA were measured in MDA-MB-231 with transfection of specific miRNA mimics. i The expression levels of FOXC1, FAM171A1 and RGMA were compared among normal (n = 113), TNBC (n = 115), non-TNBC (n = 973) samples form TCGA database. j The mRNA expressions of FOXC1, FAM171A1 and RGMA were measured in HBL-100 (normal), TNBC (MDA-MB-231, BCap37, Hs 578 T, BT-549, HCC1937) and non-TNBC (MCF-7) cell lines. Bars indicate the mean ± SD of three independent replicates. *p < 0.05, **p < 0.01, ***p < 0.001, ****p < 0.0001

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