

Anti-PECAM-1/CD31 antibody [EPR17259]

Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981) is a rabbit monoclonal antibody detecting PECAM-1/CD31 in **IHC-P, mIHC**. Suitable for **Human, Mouse, Rat**.

- Multiplex IHC validated on the Leica BOND® MAX using Opal reagents
- Biophysical QC for unrivalled batch-batch consistency
- Over 220 publications

Lab Essentials

Recombinant

RabMAb

Advanced Validation

20ul selling size

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	pH: 7.2 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	EPR17259
Purification technique	Affinity purification Protein A
Concentration	0.541 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

mIHC

Tested

Species	Human
Dilution info	1/4000
Notes	-

Species	Mouse
Dilution info	1/5000
Notes	-

Species	Rat
Dilution info	1/5000
Notes	-

IHC-P

Tested

Species	Mouse
Dilution info	1/2000 - 1/5000
Notes	In our hands we observed non-specific cytoplasmic staining on tubular cells in rat kidney. The ideal fixation time will depend on the size of the tissue block and the type of tissue, but fixation between 18–24h is suitable for most samples. Positive Control: human lung tissue. Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Species	Rat
Dilution info	1/2000
Notes	In our hands we observed non-specific cytoplasmic staining on tubular cells in rat kidney. The ideal fixation time will depend on the size of the tissue block and the type of tissue, but fixation between 18–24h is suitable for most samples. Positive Control: human lung tissue. Perform heat-mediated antigen retrieval before commencing with IHC staining protocol.

Species	Human
Dilution info	1/2000 - 1/5000
Notes	In our hands we observed non-specific cytoplasmic staining on tubular cells in rat kidney.

The ideal fixation time will depend on the size of the tissue block and the type of tissue, but fixation between 18–24h is suitable for most samples.

Positive Control: human lung tissue.

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

IHC-FoFr

Tested

Species	Mouse
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Dilution info	1/200
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Notes	-
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Species	Rat
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Dilution info	1/200
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Notes	-
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Expected

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

[See full target information PECAM-1/CD31](#) 

Function

Cell adhesion molecule which is required for leukocyte transendothelial migration (TEM) under most inflammatory conditions (PubMed:17580308, PubMed:19342684). Tyr-690 plays a critical role in TEM and is required for efficient trafficking of PECAM1 to and from the lateral border recycling compartment (LBRC) and is also essential for the LBRC membrane to be targeted around migrating leukocytes (PubMed:19342684). Trans-homophilic interaction may play a role in endothelial cell-cell adhesion via cell junctions (PubMed:27958302). Heterophilic interaction with CD177 plays a role in transendothelial migration of neutrophils (PubMed:17580308). Homophilic ligation of PECAM1 prevents macrophage-mediated phagocytosis of neighboring viable leukocytes by transmitting a detachment signal (PubMed:12110892). Promotes macrophage-mediated phagocytosis of apoptotic leukocytes by tethering them to the phagocytic cells; PECAM1-mediated detachment signal appears to be disabled in apoptotic leukocytes (PubMed:12110892). Modulates bradykinin receptor BDKRB2 activation (PubMed:18672896). Regulates bradykinin- and hyperosmotic shock-induced

ERK1/2 activation in endothelial cells (PubMed:18672896). Induces susceptibility to atherosclerosis (By similarity). Isoform Delta15. Does not protect against apoptosis.

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

Anti-CD31 antibody [EPR17259] (ab182981) was developed by Abcam using patented rabbit monoclonal antibody technology and is validated for use in IHC-P and mIHC.

Anti-CD31 antibody [EPR17259] (ab182981) was first used in a scientific publication in 2018 and has been cited over 224 times in peer reviewed journals. It's performance in IHC in human, mouse and rat samples is trusted by the scientific community.

Abcam's high quality manufacturing and validation processes ensure Anti-CD31 antibody [EPR17259] (ab182981) has high sensitivity and specificity alongside high lot-to-lot consistency and reproducibility.

Anti-CD31 antibody [EPR17259] (ab182981) has 19 independent reviews from customers.

Anti-CD31 antibody [EPR17259] (ab182981) specifically detects CD31 (UniProt ID: Q08481; Molecular weight: 80kDa) and is sold in a convenient trial size to enable initial testing (20 µL) and larger sizes for subsequent scaling up experiments (100 µL and 1 mL).

Conjugation-ready, carrier free format available for antibody clone EPR17259 - ab225883.

Antibody clone EPR17259 is also available pre-conjugated to a variety of labels for your convenience - Alexa Fluor® 647, Alexa Fluor® 488, Alexa Fluor® 555 (ab305210, ab305267, ab312892).

CD31 (PECAM-1) is a protein expressed on endothelial and immune cells, playing a crucial role in tumor angiogenesis and immune cell trafficking. In immuno-oncology, it influences the tumor microenvironment and modulates the immune response to cancer.

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

CD31 also known as Platelet Endothelial Cell Adhesion Molecule 1 (PECAM-1) is a protein with a mass of approximately 130 kDa. This protein is an important component of the cell surface and is expressed mainly in endothelial cells and certain leukocyte populations. It plays a role in cell-cell adhesion and is recognized as an important marker in immunohistochemistry (IHC) for identifying endothelial cells. CD31 is valuable for researchers focusing on vascular biology and immunology serving as a beacon for cells involved in forming blood vessels or those located within the vascular system.

Biological function summary

CD31 is important for the transendothelial migration of leukocytes. It forms complex interactions with itself (homophilic binding) and other partners to mediate processes necessary for immune response and tissue integrity. This protein supports the development and maintenance of endothelial cell junctions making it fundamental in maintaining vascular permeability. Additionally CD31 plays a role in transmitting signals that influence the survival of leukocytes and endothelial cells. Its expression and function help regulate the balance between cell life and death impacting immune function and tissue repair.

Pathways

CD31 participates actively in both immune and angiogenesis pathways. It associates with proteins like SHP-2 and SHP-1 which are involved in downstream signaling cascades critical for cell signaling and immune cell activation. Within the angiogenesis pathway CD31 interacts with other adhesion molecules to promote new blood vessel formation under physiological and pathological conditions. It also collaborates with integrins influencing cellular responses to external stimuli and contributing to vascular remodeling and repair.

Associated diseases and disorders

CD31 is significantly associated with inflammatory conditions and cardiovascular diseases. For instance its dysfunction or altered expression can contribute to atherosclerosis a disease characterized by the hardening of arteries due to plaque buildup. Furthermore CD31 deficiencies have links with autoimmune disorders where it might affect leukocyte migration and contribute to tissue damage. The protein associates with ICAM-1 during inflammatory processes illustrating its complex involvement in disease progression and potential as a therapeutic target.

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

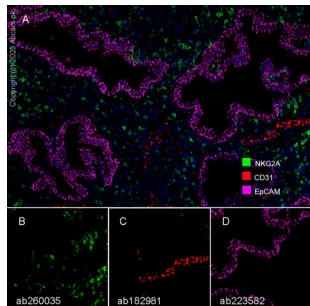
We do not recommend this combination. It is not covered by our product promise.

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.

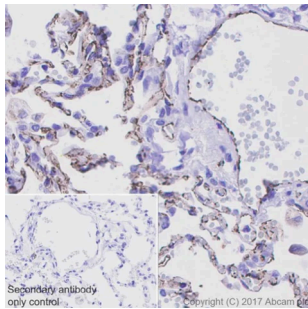
18 product images



Multiplex immunohistochemistry - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Multiplex immunohistochemistry staining of Human endometrium tissue using rabbit Anti-PECAM-1/CD31 antibody

Fluorescence multiplex immunohistochemical analysis of the human endometrium (Formalin/PFA-fixed paraffin-embedded sections). Panel A: merged staining of anti-EpCAM ([ab223582](#), magenta; Opal™690), anti-NKG2A ([ab260035](#), green; Opal™520) and anti-CD31 (ab182981, red; Opal™570) on human endometrium. Panel B: anti-NKG2A stained on NK cells. Panel C: anti-CD31 stained on endothelial cells. Panel D: anti-EpCAM stained on glandular cells. Opal Polymer HRP Ms + Rb was used as a secondary antibody. The section was incubated in three rounds of staining: in the order of [ab223582](#) at 1/500 dilution (1.008 µg/ml), [ab260035](#) at 1/2000 dilution (0.262 µg/ml) and ab182981 at 1/4000 dilution (0.137 µg/ml) for 30 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system. The immunostaining was performed on a Leica Biosystems BOND® RX instrument with an Opal™ 4-color kit. Image acquisition was performed with Leica SP8 confocal microscope. Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins. DAPI (blue) was used as a nuclear counter stain.



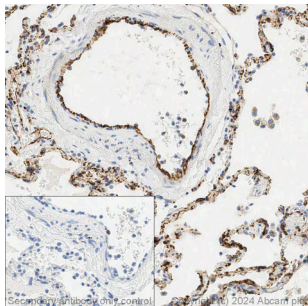
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human lung tissue using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of paraffin-embedded human lung tissue labeling CD31 with ab182981 at 1/2000 dilution followed by Goat Anti-Rabbit IgG H&L (HRP) ready to use. Membranous staining on endothelial cells in human lung (PMID: 16234507) is observed. Counterstained 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.

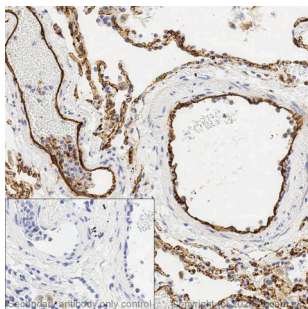
Perform heat mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human lung using rabbit Anti-PECAM-1/CD31 antibody

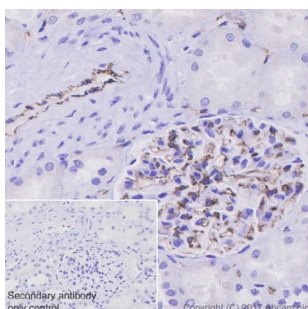
Immunohistochemical analysis of formalin fixed paraffin embedded human lung labelling CD31 with ab182981 at a concentration of 0.52 µg/ml. The immunostaining was performed on a Ventana DISCOVERY ULTRA (Roche Tissue Diagnostics) instrument with an OptiView DAB IHC Detection Kit. Heat mediated antigen retrieval was conducted for 32 mins at 100°C with ULTRA cell conditioning solution (CC1, pH 8.5). ab182981Anti-CD31 antibody was incubated at 37°C for 16 mins. Sections were counterstained with Hematoxylin II. Image inset shows absence of staining in secondary antibody only control.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human lung using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of formalin fixed paraffin embedded human lung labelling CD31 with ab182981 at a concentration of 0.35 µg/ml. The immunostaining was performed on a Leica Biosystems BOND® RX instrument with a Bond™ Polymer Refine Detection kit. Heat mediated antigen retrieval was performed with Tris-EDTA buffer (pH 9.0, Epitope Retrieval Solution 2) for 20 mins.ab182981Anti-CD31 antibody was incubated for 30 mins at room temperature. Sections were counterstained with Hematoxylin. Image inset shows absence of staining in secondary antibody only control.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

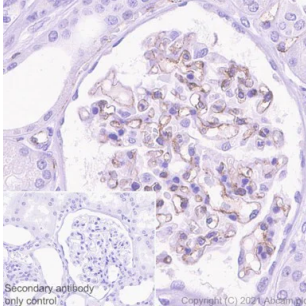
PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human kidney tissue using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of paraffin-embedded human kidney tissue labeling CD31 with ab182981 at 1/2000 dilution followed by Goat Anti-Rabbit IgG H&L (HRP) ready to use.

Membranous staining on endothelial cells in human kidney (PMID: 16234507) is observed. Counterstained 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.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human kidney using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of paraffin-embedded human kidney tissue labeling CD31 with ab182981 at 1/5000 dilution.

Positive staining on human kidney.

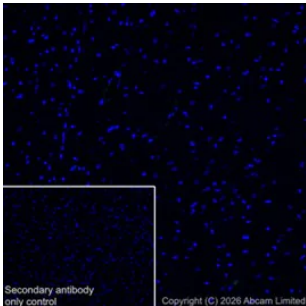
The section was incubated with ab182981 for 30 mins at room temperature.

The immunostaining was performed on a Leica Biosystems BOND® RX instrument.

Rabbit specific IHC polymer detection kit HRP/DAB ([ab209101](#)) was used as the secondary antibody and was ready to use.

Counterstained with Hematoxylin.

Heat mediated antigen retrieval was performed with Tris-EDTA buffer (pH 9.0, Epitope Retrieval Solution2™) for 20 mins.

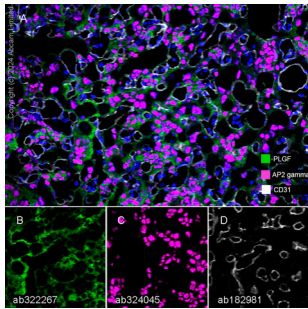


Immunohistochemistry (Frozen sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Frozen sections) staining of Frozen rat cerebrum (perfused fixed) tissue using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of 4% PFA-fixed, 0.2% Triton X-100 permeabilized frozen Rat cerebrum (perfused fixed) tissue labeling CD31 with ab182981 at 1/200 (2.64 µg/ml) dilution followed by [ab150081](#) Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed at 1/1000 (2 µg/mL) dilution (Green).

Low expression: confocal image showing weak staining on rat cerebrum. The nuclear counterstain was DAPI (Blue). The section was incubated with the primary antibody for 60 mins at room temperature. The section was then mounted using Fluoromount®. The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).



Multiplex immunohistochemistry - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Multiplex immunohistochemistry staining of Mouse placenta using rabbit Anti-PECAM-1/CD31 antibody

Multiplex immunohistochemistry analysis of formalin/PFA-fixed paraffin-embedded mouse placenta tissue staining PLGF with [ab322267](#) at a 1/2000 dilution, [ab324045](#) anti-AP2 gamma/TFAP2C used at 1/500 dilution and ab182981 anti-CD31 used at a 1/5000 dilution. Panel A: merged staining of anti-PLGF (green; Opal™520), anti-AP2 gamma/TFAP2C (magenta; Opal™690) and anti-CD31 (gray; Opal™570) on mouse placenta.

Panel B: anti-PLGF showed positive staining in mouse placenta.

Panel C: anti-AP2 gamma/TFAP2C staining trophoblast stem cells in mouse placenta.

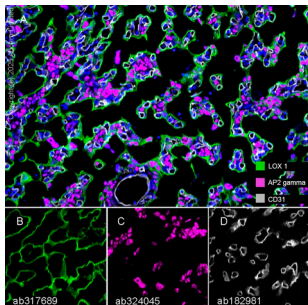
Panel D: anti-CD31 staining endothelium in mouse placenta.

Nuclear DNA was labeled with DAPI (shown in blue).

The section was incubated in three rounds of staining: in the order of [ab322267](#), [ab324045](#) and ab182981 for 30 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system.

The immunostaining was performed on a Leica Biosystems BOND® RX instrument with an Opal™ 4-color kit. Image acquisition was performed with Leica SP8 confocal microscope.

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins.



Multiplex immunohistochemistry - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Multiplex immunohistochemistry staining of Rat placenta using rabbit Anti-PECAM-1/CD31 antibody

Multiplex immunohistochemistry analysis of formalin/PFA-fixed paraffin-embedded mouse placenta tissue staining LOX 1 with [ab317689](#) at a 1/2000 dilution, [ab324045](#) anti-AP2 gamma used at 1/500 dilution and ab182981 anti-CD31 used at a 1/5000 dilution.

Panel A: merged staining of anti-LOX 1 (green; Opal™520), anti-AP2 gamma (magenta; Opal™690) and anti-CD31 (gray; Opal™570) on mouse placenta.

Panel B: anti-LOX 1 staining trophoblast in mouse placenta.

Panel C: ant-AP2 gamma staining trophoblast stem cell in mouse placenta.

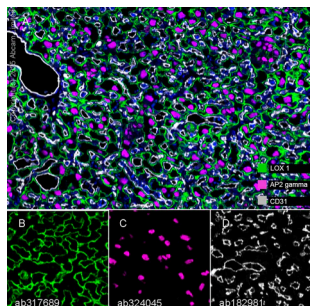
Panel D: ant-CD31 staining endothelium in mouse placenta.

Nuclear DNA was labeled with DAPI (shown in blue).

The section was incubated in three rounds of staining: in the order of [ab317689](#), [ab324045](#) and ab182981 for 30 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system.

The immunostaining was performed on a Leica Biosystems BOND® RX instrument with an Opal™ 4-color kit. Image acquisition was performed with Leica SP8 confocal microscope.

Heat mediated antigen retrieval was performed with Tris-EDTA buffer (pH 9.0, Epitope Retrieval Solution 2) for 20 mins.



Multiplex immunohistochemistry - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Multiplex immunohistochemistry staining of Mouse placenta using rabbit Anti-PECAM-1/CD31 antibody

Multiplex immunohistochemistry analysis of formalin/PFA-fixed paraffin-embedded mouse placenta tissue staining LOX 1 with [ab317689](#) at a 1/2000 dilution, [ab324045](#) anti-AP2 gamma used at 1/500 dilution and ab182981 anti-CD31 used at a 1/5000 dilution.

Panel A: merged staining of anti-LOX 1 (green; Opal™520), anti-AP2 gamma (magenta; Opal™690) and anti-CD31 (gray; Opal™570) on mouse placenta.

Panel B: anti-LOX 1 staining trophoblast in mouse placenta.

Panel C: ant-AP2 gamma staining trophoblast stem cell in mouse placenta.

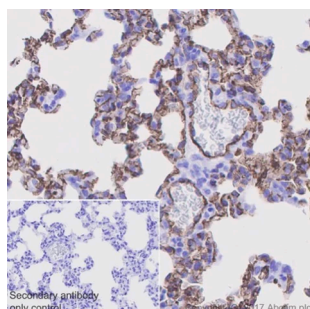
Panel D: ant-CD31 staining endothelium in mouse placenta.

Nuclear DNA was labeled with DAPI (shown in blue).

The section was incubated in three rounds of staining: in the order of [ab317689](#), [ab324045](#) and ab182981 for 30 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system.

The immunostaining was performed on a Leica Biosystems BOND® RX instrument with an Opal™ 4-color kit. Image acquisition was performed with Leica SP8 confocal microscope.

Heat mediated antigen retrieval was performed with Tris-EDTA buffer (pH 9.0, Epitope Retrieval Solution 2) for 20 mins.



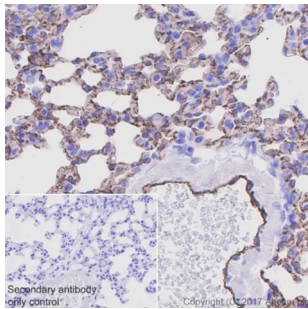
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of rat lung tissue using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of paraffin-embedded rat lung tissue labeling CD31 with ab182981 at 1/2000 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) ready to use. Membranous staining on endothelial cells in rat lung (PMID: 16234507) is observed. Counterstained 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.



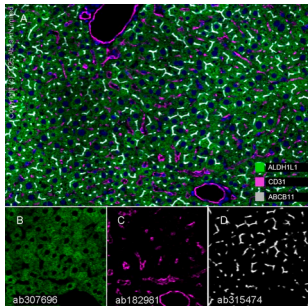
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of mouse lung tissue using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of paraffin-embedded mouse lung tissue labeling CD31 with ab182981 at 1/2000 dilution followed by Goat Anti-Rabbit IgG H&L (HRP) ready to use. Membranous staining on endothelial cells in mouse lung (PMID: 16234507) is observed. Counterstained 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.



Multiplex immunohistochemistry - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Multiplex immunohistochemistry staining of Rat liver using rabbit Anti-PECAM-1/CD31 antibody

Multiplex immunohistochemistry analysis of formalin/PFA-fixed paraffin-embedded rat liver tissue staining ALDH1L1 with ab307696 at a 1/5000 dilution, ab182981 anti-CD31 used at 1/5000 dilution and ab315474 anti-ABCB11 used at a 1/2000 dilution. Opal Polymer HRP Ms + Rb was used as a secondary antibody.

Panel A: merged staining of anti-ALDH1L1 (green; Opal™520), anti-CD31 (magenta; Opal™690) and anti-ABCB11 (grey; Opal™570) on mouse liver.

Panel B: anti-ALDH1L1 staining hepatocytes in rat liver.

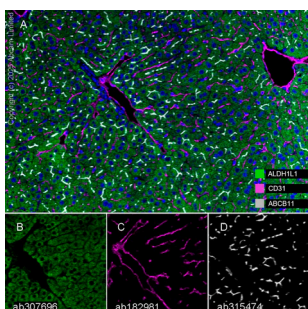
Panel C: anti-CD31 staining endothelium in rat liver.

Panel D: anti-ABCB11 staining bile canaliculi in rat liver.

Nuclear DNA was labeled with DAPI (shown in blue).

The section was incubated in three rounds of staining: in the order of ab307696, ab182981 and ab315474 for 30 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system.

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins.



Multiplex immunohistochemistry - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Multiplex immunohistochemistry staining of Mouse liver using rabbit Anti-PECAM-1/CD31 antibody

Multiplex immunohistochemistry analysis of formalin/PFA-fixed paraffin-embedded mouse liver tissue staining ALDH1L1 with ab307696 at a 1/5000 dilution, ab182981 anti-CD31 used at 1/5000 dilution and ab315474 anti-ABCB11 used at a 1/2000 dilution. Opal Polymer HRP Ms + Rb was used as a secondary antibody.

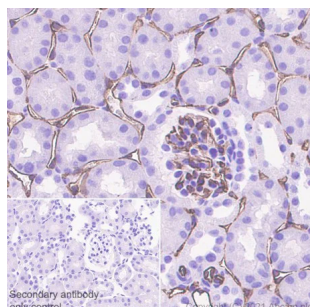
Panel A: merged staining of anti-ALDH1L1 (green; Opal™520), anti-CD31 (magenta; Opal™690) and anti-ABCB11 (grey; Opal™570) on mouse liver.

Panel B: anti-ALDH1L1 staining hepatocytes in mouse liver.

Panel C: anti-CD31 staining endothelium in mouse liver.
Panel D: anti-ABCB11 staining bile canaliculi in mouse liver.
Nuclear DNA was labeled with DAPI (shown in blue).

The section was incubated in three rounds of staining: in the order of [ab307696](#), [ab182981](#) and [ab315474](#) for 30 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system.

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Mouse kidney using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of paraffin-embedded mouse kidney tissue labeling CD31 with [ab182981](#) at 1/5000 dilution.

Positive staining on mouse kidney.

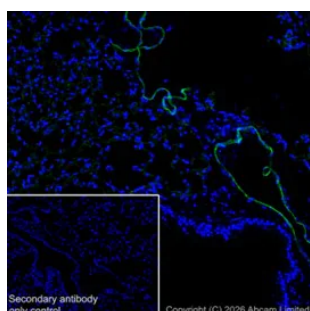
The section was incubated with [ab182981](#) for 30 mins at room temperature.

The immunostaining was performed on a Leica Biosystems BOND® RX instrument.

Rabbit specific IHC polymer detection kit HRP/DAB ([ab209101](#)) was used as the secondary antibody and was ready to use.

Counterstained with Hematoxylin.

Heat mediated antigen retrieval was performed with Tris-EDTA buffer (pH 9.0, Epitope Retrieval Solution2™) for 20 mins.

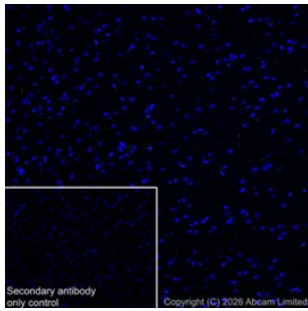


Immunohistochemistry (Frozen sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Frozen sections) staining of Frozen mouse lung (perfused fixed) tissue using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of 4% PFA-fixed, 0.2% Triton X-100 permeabilized frozen Mouse lung (perfused fixed) tissue labeling CD31 with [ab182981](#) at 1/200 (2.64 µg/ml) dilution followed by [ab150081](#) Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed at 1/1000 (2 µg/mL) dilution (Green).

Confocal image showing positive staining on mouse lung. The nuclear counterstain was DAPI (Blue). The section was incubated with the primary antibody for 60 mins at room temperature. The section was then mounted using Fluoromount®. The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).

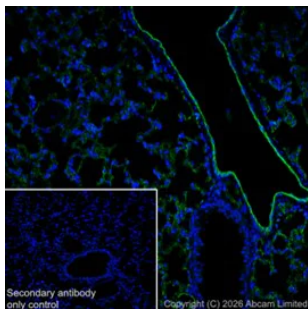


Immunohistochemistry (Frozen sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Frozen sections) staining of Frozen mouse cerebrum (perfused fixed) using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of 4% PFA-fixed, 0.2% Triton X-100 permeabilized frozen Mouse cerebrum (perfused fixed) tissue labeling CD31 with ab182981 at 1/200 (2.64 µg/ml) dilution followed by [ab150081](#) Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed at 1/1000 (2 ug/mL) dilution (Green).

Low expression: confocal image showing weak staining on mouse cerebrum. The nuclear counterstain was DAPI (Blue). The section was incubated with the primary antibody for 60 mins at room temperature. The section was then mounted using Fluoromount®. The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).



Immunohistochemistry (Frozen sections) - Anti-PECAM-1/CD31 antibody [EPR17259] (ab182981)

PECAM-1/CD31 Immunohistochemistry (Frozen sections) staining of Frozen rat lung (perfused fixed) tissue using rabbit Anti-PECAM-1/CD31 antibody

Immunohistochemical analysis of 4% PFA-fixed, 0.2% Triton X-100 permeabilized frozen Rat lung (perfused fixed) tissue labeling CD31 with ab182981 at 1/200 (2.64 µg/ml) dilution followed by [ab150081](#) Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed at 1/1000 (2 ug/mL) dilution (Green).

Confocal image showing positive staining on rat lung. The nuclear counterstain was DAPI (Blue). The section was incubated with the primary antibody for 60 mins at room temperature. The section was then mounted using Fluoromount®. The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).

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