abcam

ab14714

# Anti-SDHB antibody [21A11AE7]

Anti-SDHB antibody [21A11AE7] (ab14714) is a mouse monoclonal antibody detecting succinate dehydrogenase complex iron sulfur subunit B in **Western Blot, Flow Cytometry, IHC-Fr, ICC/IF**. Suitable for **Cow, Human, Mouse, Rat**.

- Clone 21A11AE7 is the most cited clone to SDHB
- KO validated for confirmed specificity
- Over 270 publications
- Trusted since 2004

KO Validated

## Key facts

| | |
|---|---|
| **Isotype** | IgG2a |
| **Host species** | Mouse |
| **Storage buffer** | pH: 7.5 Preservative: 0.02% Sodium azide Constituents: HEPES buffered saline |
| **Form** | Liquid |
| **Clonality** | Monoclonal |
| **Immunogen** | The exact immunogen used to generate this antibody is proprietary information. |
| **Clone number** | 21A11AE7 |
| **Purity** | IgG fraction |
| **Light chain type** | kappa |
| **Concentration** | 1 mg/mL The concentration of this product may be batch-dependent<br>Batch concentration finder → |
| **Purification notes** | Near homogeneity as judged by SDS-PAGE. The antibody was produced in vitro using hybridomas grown in serum-free medium, and then purified by biochemical fractionation. |

## Reactivity data

# Flow Cyt

## Tested

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | 1 µg for $10^6$ Cells |
| **Notes** | ab170191 - Mouse monoclonal IgG2a, is suitable for use as an isotype control with this antibody. |

## Expected

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

## Predicted

| | |
|---|---|
| **Species** | Hamster, Pig, Zebrafish |
| **Dilution info** | - |
| **Notes** | - |

# WB

## Tested

| | |
|---|---|
| **Species** | Mouse |
| **Dilution info** | 5 µg/mL |
| **Notes** | - |

| | |
|---|---|
| **Species** | Rat |
| **Dilution info** | 5 µg/mL |
| **Notes** | - |

| | |
|---|---|
| **Species** | Cow |
| **Dilution info** | 5 µg/mL |
| **Notes** | - |

### Expected

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

### Predicted

| | |
|---|---|
| **Species** | Hamster, Pig, Zebrafish |
| **Dilution info** | - |
| **Notes** | - |

## ICC/IF

### Tested

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | 1 µg/mL |
| **Notes** | - |

### Expected

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

### Predicted

| | |
|---|---|
| **Species** | Hamster, Pig, Zebrafish |
| **Dilution info** | - |
| **Notes** | - |

## IHC-Fr

### Tested

| | |
|---|---|
| **Species** | Human |
| **Dilution info** | - |
| **Notes** | - |

### Expected

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

### Predicted

| | |
|---|---|
| **Species** | Hamster, Pig, Zebrafish |
| **Dilution info** | - |
| **Notes** | - |

## Target data

See full target information SDHB

| | |
|---|---|
| **Function** | Iron-sulfur protein (IP) subunit of the succinate dehydrogenase complex (mitochondrial respiratory chain complex II), responsible for transferring electrons from succinate to ubiquinone (coenzyme Q) (PubMed:26925370, PubMed:27604842). SDH also oxidizes malate to the non-canonical enol form of oxaloacetate, enol-oxaloacetate (By similarity). Enol-oxaloacetate, which is a potent inhibitor of the succinate dehydrogenase activity, is further isomerized into keto-oxaloacetate (By similarity). |

## Storage

| | |
|---|---|
| **Shipped at conditions** | Blue Ice |
| **Appropriate short-term storage conditions** | +4°C |
| **Appropriate long-term storage conditions** | +4°C |

## Notes

**Product Specifications**
Anti-SDHB antibody [21A11AE7] (ab14714) is a mouse monoclonal antibody and is validated for use in Flow Cyt, ICC/IF, IHC-Fr, WB in cow, human, mouse, rat samples.
Anti-SDHB antibody [21A11AE7] (ab14714) specifically detects SDHB (UniProt ID: P21912; Molecular weight: 29kDa) and is sold in 100 µg selling sizes.

**Quality and Validation**
Abcam's high quality validation processes ensure Anti-SDHB antibody [21A11AE7] (ab14714) has high sensitivity and specificity.
The specificity of Anti-SDHB antibody [21A11AE7] (ab14714) has been confirmed by testing in knockout samples.
Anti-SDHB antibody [21A11AE7] (ab14714) has been cited over 276 times in peer reviewed journals and is trusted by the scientific community.
Anti-SDHB antibody [21A11AE7] (ab14714) has 12 independent reviews from customers.

**Related Products**
Antibody clone 21A11AE7 is also available pre-conjugated to a variety of labels for your convenience - Alexa Fluor® 647, Alexa Fluor® 488, HRP (ab197722, ab197902, ab197903).

**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** | The protein SDHB also known as Succinate Dehydrogenase Complex Iron Sulfur Subunit B plays a mechanical role as a component of the succinate dehydrogenase (SDH) enzyme. This subunit has a molecular mass of approximately 30 kDa. SDHB is part of the mitochondrial inner membrane where it is expressed in high levels across various tissues including heart kidney and muscle. It contributes to the electron transport chain by facilitating the oxidation of succinate to fumarate an important step in energy production through the tricarboxylic acid (TCA) cycle. |
| **Biological function summary** | SDHB participates in the succinate dehydrogenase complex acting within both the TCA cycle and the electron transport chain. By transferring electrons to coenzyme Q it helps generate an electrochemical gradient important for ATP synthesis. This complex also called Complex II includes other subunits such as SDHA SDHC and SDHD. Their interactions ensure proper function of metabolic processes within mitochondria bridging the gap between foundational energy metabolism and complex cellular processes. |
| **Pathways** | SDHB plays an important role in cellular respiration and metabolic cycles. It resides in the TCA cycle and the mitochondrial electron transport chain connecting its function to energy generation pathways. Specifically SDHB relates closely to SDHA and coenzyme Q all working together to facilitate electron transfer and effective mitochondrial energy output. The transfer of electrons through this pathway highlights its essential contribution to maintaining cellular energy homeostasis. |

| | |
|---|---|
| **Associated diseases and disorders** | SDHB mutations are associated with conditions such as paraganglioma and pheochromocytoma. These genetic alterations disrupt normal complex II function leading to the accumulation of succinate and succinate-related oncogenesis. In addition to causing tumor development defective SDHB is linked with familial paraganglioma syndromes. Its interaction with proteins such as SDHA and SDHD critical for the succinate dehydrogenase functionality highlights its significant role in maintaining metabolic balance and when defective contributing to disease pathogenesis. |

## 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**

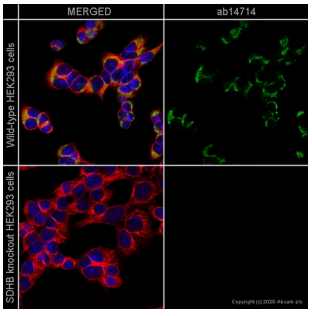
We do not recommend this combination. It is not covered by our product promise.

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.

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Terms & Conditions.

## 9 product images

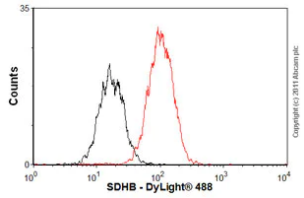



### Immunocytochemistry/ Immunofluorescence - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Immunocytochemistry/ Immunofluorescence staining using mouse Anti-SDHB antibody

ab14714 staining SDHB in wild-type HEK293 cells (top panel) and SDHB knockout HEK293 cells (bottom panel). The cells were fixed with 100% methanol (5 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 ab14714 at 5µg concentration and ab6046 (Rabbit polyclonal to beta 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 mouse IgG (Alexa Fluor®

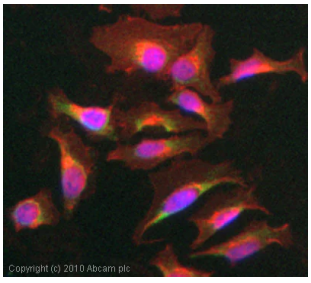
488) (ab150117) at 2 µg/ml (shown in green) and a goat secondary antibody to rabbit IgG (Alexa Fluor® 594) (ab150080) at 2 µg/ml (shown in red). Nuclear DNA was labelled in blue with DAPI. Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).




## Flow Cytometry - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Flow Cytometry staining using mouse Anti-SDHB antibody

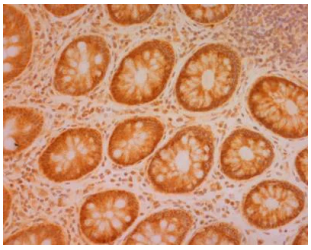
Overlay histogram showing HEK-293 (human epithelial cell line from embryonic kidney) cells stained with ab14714 (red line). The cells were fixed with 80% methanol (5 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab14714, 1µg/1x$10^6$ cells) for 30 min at 22°C. The secondary antibody used was DyLight® 488 goat anti-mouse IgG (H+L) (ab96879) at 1/500 dilution for 30 min at 22°C. Isotype control antibody (black line) was mouse IgG2a [ICIGG2A] (ab91361, 1µg/1x$10^6$ cells) used under the same conditions. Acquisition of >5,000 events was performed.



## Immunocytochemistry/ Immunofluorescence - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Immunocytochemistry/ Immunofluorescence staining using mouse Anti-SDHB antibody

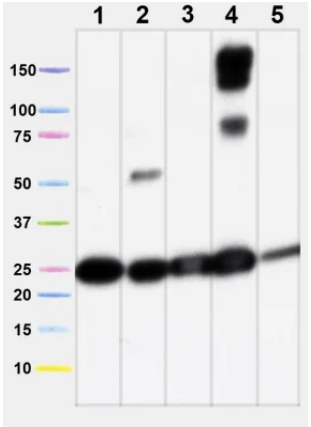
ICC/IF image of ab14714 stained HeLa (human epithelial cell line from cervix adenocarcinoma) cells. The cells were 4% formaldehyde fixed (10 min) and then incubated in 1%BSA / 10% normal goat serum / 0.3M glycine in 0.1% PBS-Tween for 1h to permeabilise the cells and block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab14714, 1µg/ml) overnight at +4°C. The secondary antibody (green) was Alexa Fluor® 488 goat anti-mouse IgG (H+L) used at a 1/1000 dilution for 1h. Alexa Fluor® 594 WGA was used to label plasma membranes (red) at a 1/200 dilution for 1h. DAPI was used to stain the cell nuclei (blue) at a concentration of 1.43µM.



## Immunohistochemistry (Frozen sections) - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Immunohistochemistry (Frozen sections) staining using mouse Anti-SDHB antibody

ab14714 staining SDHB in normal ageing human colon tissue by Immunohistochemistry (Frozen sections).




## Western blot - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Western blot staining using mouse Anti-SDHB antibody

Extra bands in the mouse sample (lane 4) are due to the reaction of the IgG-specific goat anti-mouse secondary antibody with residual mouse blood in the heart tissue, as it is very difficult to entirely remove the blood from these small organs.
All lanes:
Western blot - Anti-SDHB antibody [21A11AE7] (ab14714) at 5 µg/mL

Lane 1:
Isolated mitochondria from Human heart at 5 µg

Lane 2:
Isolated mitochondria from Bovine Heart at 1 µg

Lane 3:
Isolated mitochondria from Rat heart at 10 µg

Lane 4:
Isolated mitochondria from Mouse heart at 10 µg

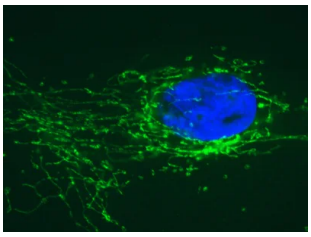
Lane 5:
Isolated mitochondria from HepG2 (human liver hepatocellular carcinoma cell line) cells at 20 µg

Secondary

All lanes:
Goat anti-Mouse secondary

Predicted band size: 32 kDa

Observed band size: 28 kDa, 55 kDa



## Immunocytochemistry/ Immunofluorescence - Anti-SDHB antibody [21A11AE7] (ab14714)

Mitochondrial localization of complex II visualized by immunocytochemistry using anti-complex II subunit 30 kDa Ip mAb 21A11 (ab14714). Cells were fixed, permeabilized and then labeled with ab14714 followed by an Alexa Fluor® 488-conjugated-goat-anti-mouse IgG2a isotype specific secondary antibody.

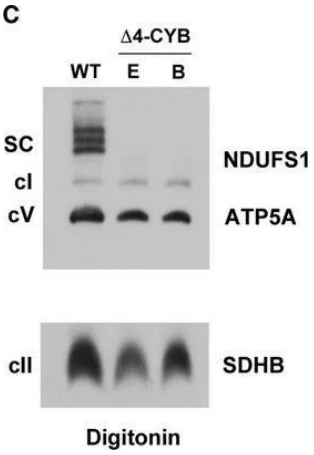


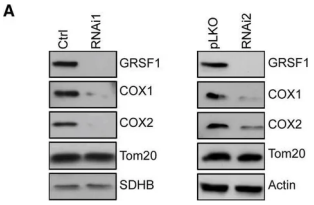

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## Western blot - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Western blot staining using mouse Anti-SDHB antibody

Western Blotting using Anti-SDHB antibody [21A11AE7], ab14714. Publication image from Protasoni, M. et al., 2020, EMBO J, 31912925. Legend direct from paper.

Complex I and IV enzymatic deficiencies in δ4⊠CYB cellsThe activities (mUnits/g of protein) of the MRC enzymes were determined by spectrophotometric kinetic measurements in WT and δ4⊠CYB cells and normalized by the percentage of citrate synthase (CS) activity. Results are expressed as mean ± SD (n = 4–6 biological replicates). Unpaired Student's t⊠test **P = 0.0100; ***P = 0.0002; ****P < 0.0001.Complex I in⊠gel activity assays (IGA) after blue⊠native gel electrophoresis (BNGE) of WT and δ4⊠CYB samples solubilized with either 1.6 mg DDM/mg protein or 4 mg digitonin/mg protein. The gels were incubated in the reaction mixture for 1.5 h (lighter signals in DDM gels) or were left to continue the reaction for 24 h to obtain darker signals (DDM and Digitonin gels).BNGE, Western blot, and immunodetection, with anti⊠NDUFS1 (cI), anti⊠ATP5A (cV), and anti⊠SDHB (cII) antibodies, of samples from the WT cybrids and from δ4⊠CYB clones E (#17.3E) and B (#17.3B). Clone E was the cell line of choice for the analysis shown in panels (A and B), and all the figures hereafter.Source data are available online for this figure.




## Western blot - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Western blot staining using mouse Anti-SDHB antibody

Western Blotting using Anti-SDHB antibody [21A11AE7], ab14714. Publication image from Wydro, M. et al., 2013, Cell Metab, 23473034. Legend direct from paper.

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GRSF1 Is Required for Mitochondrial Gene Expression(A) Left panel, immunoblot analysis of 143B cells treated with control (Ctrl) or GRSF1 RNAi1. Right panel, immunoblot analysis of 143B cells infected with lentiviruses carrying an empty vector (pLKO) or a shRNA (RNAi2) against GRSF1. COX1 and COX2 are mitochondrially encoded proteins. SDHB and Tom20 are nuclear-encoded mitochondrial proteins. Actin is a nuclear-encoded cytosolic protein.(B) Acidification of the culture medium in GRSF1 RNAi1-treated 143B cells. The number of cells was the same in both conditions. Similar results were obtained in GRSF1 RNAi2-infected cells (data not shown).(C) NanoString analysis of 11 mitochondrially encoded ORFs in control (Ctrl) or GRSF1 RNAi1-treated 143B cells. RNA14 corresponds to bicistronic MTATP8-MTATP6 RNA. Data are shown as mean ± SEM (n = 3).(D) NanoString analysis of GRSF1 in control (Ctrl) or GRSF1 RNAi1-treated 143B cells. Data are shown as mean ± SEM (n = 3).(E) NanoString analysis of 11 nuclear-encoded proteins in control (Ctrl) or GRSF1 RNAi1-treated 143B cells. Data are shown as mean ± SEM (n = 3).(F) Northern blot analysis of 12S and 16S rRNA in control (Ctrl) or GRSF1 RNAi1-treated cells. TUB, tubulin.(G) Phosphorimager quantification of (E). Data are shown as mean ± SEM (n = 3).(H) 35S-labeling of mitochondrial translation of 143B cells infected with lentiviruses carrying an empty vector (pLKO) or a shRNA (RNAi2) against GRSF1.(I) Phosphorimager quantification of (H). Data are normalized to the Ponceau S intensity and are shown as mean ± SEM (n = 4).

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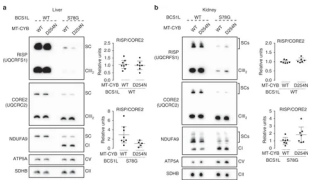


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## Western blot - Anti-SDHB antibody [21A11AE7] (ab14714)

SDHB Western blot staining using mouse Anti-SDHB antibody

Western Blotting using Anti-SDHB antibody [21A11AE7], ab14714. Publication image from Sharma, V. et al., 2020, Nat Commun, 31949167. Legend direct from paper.

Analysis of RISP steady state level in CIII.a, b BNGE analyses of digitonin-solubilized mitochondria from a liver and b kidney. ATP5A and SDHB are shown as loading controls. The individually analyzed and quantified samples were pooled together to prepare the representative blots. SC supercomplex. Error bars represent 95% CI of the mean.

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