abcam

ab55735

Anti-DMT1 antibody [4C6]

Anti-DMT1 antibody [4C6] (ab55735) is a mouse monoclonal antibody detecting DMT1 in **Western Blot, Flow Cytometry, IHC-P, IHC-Fr**. Suitable for **Human, Mouse,**.

- KO validated for confirmed specificity
- Over 30 publications
- Trusted since 2007

KO Validated

Key facts

Isotype	IgG2a
Host species	Mouse
Storage buffer	pH: 7.4 Constituents: 100% 1X PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	Recombinant Fragment Protein within Human SLC11A2 aa 1-100. The exact immunogen used to generate this antibody is proprietary information. Database link P49281
Clone number	4C6
Purification technique	Affinity purification Protein A
Light chain type	kappa

Reactivity data

Flow Cyt

Tested

Species	Human
Dilution info	-
Notes	ab170191 - Mouse monoclonal IgG2a, is suitable for use as an isotype control with this antibody.

Expected

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

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	1/1000
Notes	-

Species	Recombinant fragment
Dilution info	-
Notes	-

Expected

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

IHC-P

Tested

Species	Human
Dilution info	-
Notes	-

Expected

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

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

IHC-Fr

Tested

Species	Mouse
Dilution info	-
Notes	-

Expected

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

Not recommended

Species	Recombinant fragment
Dilution info	-

Notes	-

Target data

See full target information SLC11A2

Function	Proton-coupled metal ion symporter operating with a proton to metal ion stoichiometry of 1:1 (PubMed:17109629, PubMed:17293870, PubMed:22736759, PubMed:25326704, PubMed:25491917). Selectively transports various divalent metal cations, in decreasing affinity: Cd(2+) > Fe(2+) > Co(2+), Mn(2+) >> Zn(2+), Ni(2+), VO(2+) (PubMed:17109629, PubMed:17293870, PubMed:22736759, PubMed:25326704, PubMed:25491917). Essential for maintenance of iron homeostasis by modulating intestinal absorption of dietary Fe(2+) and TF-associated endosomal Fe(2+) transport in erythroid precursors and other cells (By similarity). Enables Fe(2+) and Mn(2+) ion entry into mitochondria, and is thus expected to promote mitochondrial heme synthesis, iron-sulfur cluster biogenesis and antioxidant defense (By similarity) (PubMed:24448823). Can mediate uncoupled fluxes of either protons or metal ions.

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

What is this antibody validated in?
Anti-DMT1 antibody [4C6] (ab55735) is a mouse monoclonal antibody and is validated for use in Western Blot (WB), Flow Cytometry (Flow Cyt), Immunohistochemistry (IHC-P), Immunohistochemistry (IHC-Fr) in Human, Mouse, samples.

What is the molecular weight of DMT1?
Anti-DMT1 [4C6] (ab55735) specifically detects a band for DMT1 (UniProt: P49281) at a molecular weight of 62kDa.

Trusted by the scientific community
Anti-DMT1 [4C6] (ab55735) was first used in a scientific publication in 2007 and has been cited over 30 times in peer-reviewed journals.

Specificity confirmed
The specificity of Anti-DMT1 antibody [4C6] (ab55735) has been confirmed by Western blot testing in SLC11A2 Knockout A549 cells.

Supplementary info

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

Activity summary	The DMT1 protein also known as divalent metal transporter 1 or NRAMP2 functions as an essential transporter for divalent metal ions including iron and manganese. DMT1 has a molecular mass around 65 kDa and is expressed widely in tissues like the intestine liver and brain where it facilitates the uptake of these ions. In the gut it plays a significant role in iron absorption from dietary sources. DMT1 protein contributes to maintaining systemic iron levels important for many physiological processes.
Biological function summary	DMT1 facilitates cellular uptake of iron important for oxygen transport and DNA synthesis. As part of its function DMT1 operates independently not as a component of a larger protein complex enabling it to transport metal ions across cell membranes directly. This process ensures that cells receive necessary ions for their metabolic activities and energy production aiding in cellular homeostasis.
Pathways	DMT1 integrates into important biological systems like the iron metabolism pathway and the manganese transport pathway. It works alongside ferritin a protein responsible for storing iron within cells to regulate iron availability and prevent toxicity. Similarly its role in the manganese transport pathway helps maintain manganese homeostasis which protease enzymes and neurotransmitter synthesis rely on.
Associated diseases and disorders	DMT1 shows significant relevance to iron overload conditions such as hemochromatosis and neurodegenerative diseases like Parkinson's disease. Mutations or dysregulation in DMT1 expression can lead to improper iron accumulation contributing to oxidative stress and neuronal damage respectively. Its role in iron uptake and regulation therefore connects it with proteins like hepcidin influential in maintaining iron balance impacting these conditions.

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.

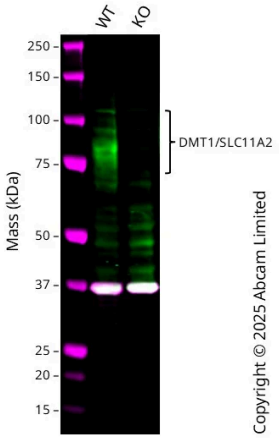
We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

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:
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9 product images



Western blot - Anti-DMT1 antibody [4C6] (ab55735)

DMT1 Western blot staining using mouse Anti-DMT1 antibody

Western blot: Mouse Monoclonal[4C6] to DMT1 ab55735 staining at 1/1000 dilution, shown in green; Rabbit anti GAPDH (ab181602) loading control staining at 1/20,000 dilution, shown in magenta. A band was observed at 80 kDa in Wild-type A549 cell lysates with no signal observed at this size in SLC11A2 knockout A549 cell line (ab326025). To generate this image, samples were run on an SDS-PAGE gel then transferred onto a nitrocellulose membrane. Membranes were blocked in 3pc Milk in TBS-0.1 % Tween® 20 (TBS-T) before incubation with primary antibodies overnight at 4 °C. Blots were washed four times in TBS-T, incubated with secondary antibodies for 1 h at room temperature, washed again four times then imaged. Secondary antibodies used were Goat anti-Mouse 800CW & Goat anti-Rabbit 680RD at 1/20,000 dilution.
All lanes:
Western blot - Anti-DMT1 antibody [4C6] (ab55735) at 1/1000 dilution

Lane 1:
Wild-type A549 at 20 µg

Lane 2:
Western blot - Human SLC11A2 knockout A549 cell line (ab326025) at 20 µg

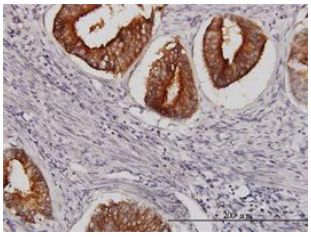
Secondary

All lanes:
Goat anti-Mouse 800CW & Goat anti-Rabbit 680RD at 1/20000 dilution

Performed under reducing conditions.

Predicted band size: 62 kDa

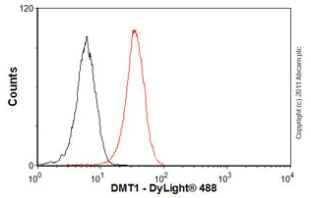
Observed band size: 80 kDa



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-DMT1 antibody [4C6] (ab55735)

DMT1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-DMT1 antibody

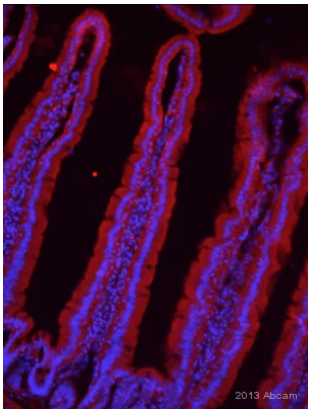
DMT1 antibody (ab55735) used in immunohistochemistry at 3ug/ml on formalin fixed and paraffin embedded human endometrium cancer.
This image was generated using the ascites version of the product.



Flow Cytometry - Anti-DMT1 antibody [4C6] (ab55735)

DMT1 Flow Cytometry staining using mouse Anti-DMT1 antibody

Overlay histogram showing SH-SY5Y cells stained with ab55735 (red line). The cells were fixed with 4% paraformaldehyde (10 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 (ab55735, 1µg/1x10^6 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/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was performed. This antibody gave a positive signal in SH-SY5Y cells fixed with 80% methanol/permeabilized in 0.1% PBS-Tween used under the same conditions.
This image was generated using the ascites version of the product.

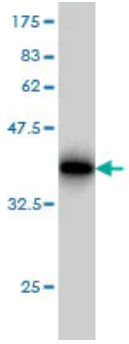


This image is courtesy of a customer review submitted by Dr. Ruma Raha-Chowdhury, Cambridge University, United Kingdom.

Immunohistochemistry (Frozen sections) - Anti-DMT1 antibody [4C6] (ab55735)

DMT1 Immunohistochemistry (Frozen sections) staining using mouse Anti-DMT1 antibody

IHC-Fr image of DMT1 staining on mouse duodenum using ab55735 (1:1000). The sections were fixed with paraformaldehyde and permeabilized using 0.1% TritonX in 0.1% PBS. The slides were blocked using 10 % donkey serum for 1 hour at 24°C. ab55735 was diluted 1:1000 using 0.1% TritonX with 0.1x PBS- 10% Donkeys and incubated with the slides at 4°C for 24 hours. The secondary antibody used was donkey polyclonal against mouse IgG conjugated to Alexa Fluor 568 (1:1000)
This image was generated using the ascites version of the product.



Western blot - Anti-DMT1 antibody [4C6] (ab55735)

Western blot against tagged recombinant protein fragment (immunogen peptide) using ab55735 DMT1 antibody at 1ug/ml.
This image was generated using the ascites version of the product.

All lanes:
Western blot - Anti-DMT1 antibody [4C6] (ab55735)

Predicted band size: 62 kDa

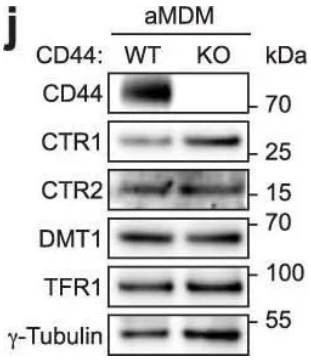


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Western blot - Anti-DMT1 antibody [4C6] (ab55735)

DMT1 Western blot staining using mouse Anti-DMT1 antibody

Western Blotting using Anti-DMT1 antibody [4C6], ab55735. Publication image from Solier, S. et al., 2023, Nature, 37100912. Legend direct from paper.

Mitochondrial copper(II) regulates epigenetic states and transcriptional programs of inflammatory macrophages.a, Representative western blots (top) of proteins involved in inflammation in MDM treated with LCC-12 and corresponding quantifications (bottom) (n = 8 donors). b, Immunoassay of cytokines secreted by MDM treated with LCC-12 during activation (n = 6 donors). c, PCA of RNA-seq comparing naMDM (n = 10 donors), aMDM (n = 10 donors) and MDM treated with LCC-12 during activation (n = 5 donors). d, Fluorescence microscopy quantifications of histone H3 methyl and acetyl marks in MDM treated with LCC-12. Quantifications were normalized against naMDM. At least 50 cells were quantified per donor per condition (n = 5–7 donors). e, Scatter plot correlation of a representative donor of ChIP-seq reads count of histone marks in genes against RNA-seq of gene transcripts in aMDM (n = 10 donors) and MDM treated with LCC-12 during activation (n = 5 donors). f, ChIP-seq tracks of selected genes involved in inflammation in MDM. g, Western blots of proteins involved in inflammation in aMDM under SOD2 knockdown conditions. h, Western blots of proteins involved in inflammation in aMDM under SLC25A3 knockdown conditions. i, Flow cytometry of wild-type (WT) and CD44 knockout (KO) aMDM. Gating strategy see Supplementary Information. j, Western blots of metal transporter proteins in WT and CD44-KO aMDM in n = 1 donor. k, Western blots of proteins involved in inflammation and histone marks in WT aMDM and CD44-KO aMDM for n = 3 donors. H3 is a sample processing control. For a and d Kruskal-Wallis test with Dunn’ s post-test. For b, g and h two-sided Mann-Whitney test. Box plots: boxes represent interquartile range and median, and whiskers indicate the minimum and maximum values. Each colored dot represents a distinct donor for a given panel.Source data

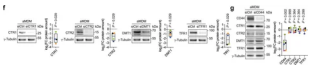


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DMT1 Western blot staining using mouse Anti-DMT1 antibody

Western Blotting using Anti-DMT1 antibody [4C6], ab55735. Publication image from Solier, S. et al., 2023, Nature, 37100912. Legend direct from paper.

CD44 mediates the uptake of metals in inflammatory macrophages.a, Flow cytometry of cell surface markers in MDM. Monocytes treated as indicated to obtain pro-inflammatory or anti-inflammatory states. b, Flow cytometry of cell surface markers in MDM. Data representative of n = 13 donors. c, Bright field microscopy images of MDM. Scale bar, 20 µm. Morphological observations representative of n = 128 donors. d, ICP-MS of cellular metals in MDM (n = 9 donors). e, ICP-MS of cellular metals in aMDM under knockdown conditions of indicated genes (n = 6 donors). f, Western blots of cellular metal transporters in aMDM under knockdown conditions of indicated genes (n = 4 donors). g, Western blots of cellular metal transporters in aMDM under CD44 knockdown conditions (n = 6 donors). For d, f and g two-sided Mann-Whitney test. For e, Kruskal-Wallis test with Dunn’ s post-test. Box plots: boxes represent interquartile range and median and whiskers indicate the minimum and maximum values. Each colored dot represents a distinct donor for a given panel.Source data

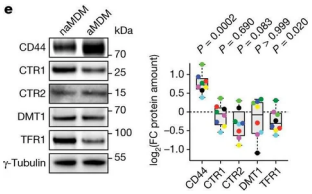


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DMT1 Western blot staining using mouse Anti-DMT1 antibody

Western Blotting using Anti-DMT1 antibody [4C6], ab55735. Publication image from Solier, S. et al., 2023, Nature, 37100912. Legend direct from paper.

CD44 mediates copper uptake.a, Experimental setup used to generate inflammatory monocyte-derived macrophages (MDMs). b, Flow cytometry of CD44 in MDMs. Data are representative of n = 13 donors. AU, arbitrary units. c, ICP-MS of cellular copper in MDMs (n = 9 donors). d, ICP-MS of cellular copper in aMDMs with short interfering RNA (siRNA) knockdown of indicated receptors and transporters (n = 6 donors). Copper transporter 1 (CTR1) is encoded by SLC31A1, CTR2 is encoded by SLC31A2, transferrin receptor 1 (TFR1) is encoded by TFRC, and divalent metal transporter 1 (DMT1) is encoded by SLC11A2. siCtrl, control siRNA. e, Representative western blots of metal transporters in MDMs (n = 7 donors). FC, fold change. f, ICP-MS of cellular copper in MDMs treated with anti-CD44 antibody RG7356 during activation (n = 7 donors). g, ICP-MS of cellular copper in MDMs treated with hyaluronate (0.6–1 MDa) (HA) or permethylated hyaluronate (meth–HA) during activation (n = 6 donors). h, Molecular structure of hyaluronate tetrasaccharide (top) and 1H NMR spectra (bottom) of copper–hyaluronate complexation experiment, recorded at 310 K in D2O. i, Fluorescence microscopy of a lysosomal copper(ii) probe (Lys-Cu) and FITC–hyaluronate in aMDMs treated with hyaluronidase (HD). At least 30 cells were quantified per donor (n = 6 donors). Scale bar, 10 µm. Rel., relative. c,e,f,i, Two-sided Mann–Whitney test. d,g, Kruskal–Wallis test with Dunn’ s post test. In all box plots in the main figures, boxes represent the interquartile range, centre lines represent medians and whiskers indicate the minimum and maximum values. In graphs, each coloured dot represents an individual donor for a given panel.Source data

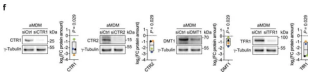


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