abcam

ab10558

Anti-CD45 antibody

Anti-CD45 antibody (ab10558) is a rabbit polyclonal antibody detecting CD45 in **Western Blot, Flow Cytometry (Intra), IHC-P**. Suitable for **Human, Mouse, Rat**.

- Over 450 publications
- Trusted since 2005

Key facts

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

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	0.5-5 µg/mL
Notes	

	Perform heat-mediated antigen retrieval before commencing with IHC staining protocol.

Expected

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

Predicted

Species	Pig, Rhesus monkey
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1 µg for 10^5 Cells
Notes	ab171870 - Rabbit polyclonal IgG, is suitable for use as an isotype control with this antibody.

Expected

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

Predicted

Species	Pig, Rhesus monkey
Dilution info	-
Notes	-

WB

Tested

Species	Mouse
Dilution info	1/500
Notes	-

Species	Rat
Dilution info	1/500
Notes	-

Species	Human
Dilution info	1/500
Notes	-

Predicted

Species	Pig, Rhesus monkey
Dilution info	-
Notes	-

Target data

See full target information PTPRC

Function

Protein tyrosine-protein phosphatase required for T-cell activation through the antigen receptor (PubMed:35767951). Acts as a positive regulator of T-cell coactivation upon binding to DPP4. The first PTPase domain has enzymatic activity, while the second one seems to affect the substrate specificity of the first one. Upon T-cell activation, recruits and dephosphorylates SKAP1 and FYN. Dephosphorylates LYN, and thereby modulates LYN activity (By similarity). Interacts with CLEC10A at antigen presenting cell-T cell contact; CLEC10A on immature dendritic cells recognizes Tn antigen-carrying PTPRC/CD45 receptor on effector T cells and modulates T cell activation threshold to limit autoreactivity. (Microbial infection) Acts as a receptor for human cytomegalovirus protein UL11 and mediates binding of UL11 to T-cells, leading to reduced induction of tyrosine phosphorylation of multiple signaling proteins upon T-cell receptor stimulation and impaired T-cell proliferation.

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

Anti-CD45 antibody (ab10558) is a rabbit polyclonal antibody and is validated for use in Flow Cyt (Intra), IHC-P, WB in human samples.

Anti-CD45 antibody (ab10558) has been cited over 450 times in peer reviewed journals and is trusted by the scientific community.

Abcam's high quality validation processes ensure Anti-CD45 antibody (ab10558) has high sensitivity and specificity.

Anti-CD45 antibody (ab10558) has 56 independent reviews from customers.

Anti-CD45 antibody (ab10558) specifically detects CD45 (UniProt ID: P08575; Molecular weight: 145kDa) and is sold in 100 µg selling sizes.

CD45, also known as the leukocyte common antigen, is a transmembrane protein tyrosine phosphatase crucial for immune cell signaling. It exists in multiple isoforms, such as CD45RA and CD45RO, which help distinguish between different immune cell types and their functional states. CD45 plays a significant role in regulating lymphocyte development, activation, and homeostasis. Alterations in CD45 expression or function are linked to various immunodeficiencies and autoimmune disorders, highlighting its importance in maintaining immune balance. Autoimmune diseases related to CD45 involve alterations in the expression or function of this protein, which can disrupt normal immune cell signaling and lead to immune system dysregulation.

Supplementary info

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

Activity summary	CD45 also known as Leukocyte Common Antigen (LCA) or protein tyrosine phosphatase receptor type C (PTPRC) plays an important role in regulating immune cell signaling. It is a transmembrane protein with a molecular mass around 180-240 kDa due to different isoforms produced by alternative splicing. This protein is expressed on all nucleated hematopoietic cells including T cells B cells and NK cells. CD45 differentiates leukocytes from other human cell types making it an important marker in immunological studies.

Biological function summary	CD45 functions as a regulator of tyrosine phosphorylation important for leukocyte signaling. It is not part of a complex but it acts independently to modulate receptor signaling thresholds. CD45 dephosphorylates Src family kinases which initiates T cell and B cell antigen receptor signaling. This regulation is necessary for lymphocyte maturation activation and homeostasis indicating CD45's significant role in the immune response.
Pathways	CD45 influences both the T-cell receptor (TCR) and B-cell receptor (BCR) signaling pathways. It impacts the Src family kinases including Lck and Fyn in T cells allowing efficient signal transduction following antigen recognition. The protein also aids in down-regulating signals from various immune checkpoints impacting activation pathways through related proteins like CD3 and CD19. By influencing these pathways CD45 ensures proper lymphocyte function and immune response modulation.
Associated diseases and disorders	CD45 is closely linked to autoimmune diseases and leukemias. Its altered expression or mutation can result in improper immune system function contributing to autoimmunity as seen in rheumatoid arthritis. Furthermore aberrations in CD45 are associated with chronic lymphocytic leukemia where it impacts leukocyte differentiation and survival. Through its connections to Src family kinases in these conditions CD45 plays a critical role in disease development and progression making it a target for diagnostic and therapeutic strategies.

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

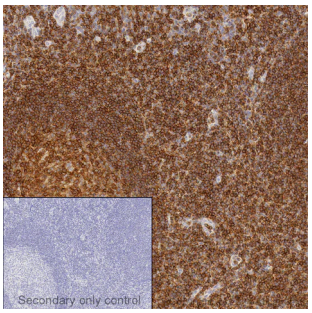
We do not recommend this combination. It is not covered by our product promise.

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.

15 product images

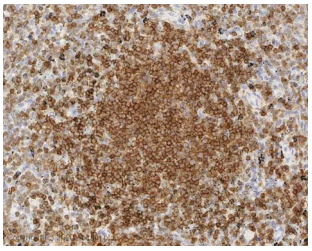


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human tonsil using rabbit Anti-CD45 antibody

Immunohistochemical analysis of formalin fixed paraffin embedded human tonsil labelling CD45 with ab10558 at a concentration of 0.5µg/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 20mins. ab10558 anti-CD45 antibody was incubated for 15mins at room temperature. Sections were counterstained with Hematoxylin. Image inset shows absence of staining in secondary antibody only control.

Customers are encouraged to optimise antigen retrieval conditions, antibody concentration, incubation times and temperature for best results in their own IHC assay workflow (automated and manual).

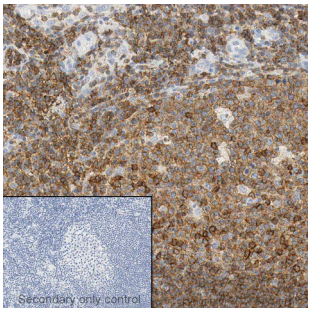


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human spleen tissue using rabbit Anti-CD45 antibody

IHC image of CD45 antibody staining in a section of formalin-fixed paraffin-embedded normal human spleen* performed on a Leica BOND™ system using the standard protocol. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH6 epitope retrieval solution 1) for 20mins. The section was then incubated with ab10558 1ug/ml for 15 mins at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX. For other IHC staining systems (automated and non-automated) customers should optimize variable parameters such as antigen retrieval conditions primary antibody concentration and antibody incubation times.

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

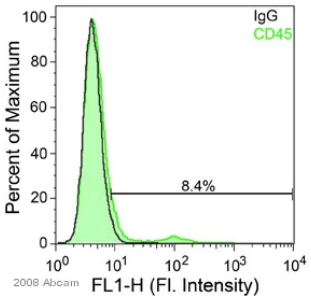


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human tonsil using rabbit Anti-CD45 antibody

Immunohistochemical analysis of formalin fixed paraffin embedded human tonsil labelling CD45 with ab10558 at a concentration of 0.1µg/ml. The immunostaining was performed on a Ventana DISCOVERY ULTRA (Roche Tissue Diagnostics) instrument with a OptiView DAB IHC Detection Kit. Heat mediated antigen retrieval was performed with DISCOVERY cell conditioning solution (CC1) 100°C, pH8.5 for 32mins. ab10558 anti-CD45 antibody was incubated for 16mins at 37°C. Sections were counterstained with Hematoxylin II. Image inset shows absence of staining in secondary antibody only control.

Customers are encouraged to optimise antigen retrieval conditions, antibody concentration, incubation times and temperature for best results in their own IHC assay workflow (automated and manual).

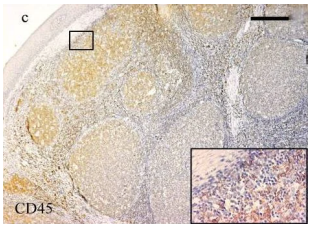


This image is courtesy of a customer review submitted by Kirk Mcmanu.

Flow Cytometry (Intracellular) - Anti-CD45 antibody (ab10558)

CD45 Flow Cytometry (Intracellular) staining of KM-H2 cells using rabbit Anti-CD45 antibody

Asynchronous KM-H2 cells were pelleted and labeled by indirect immunofluorescence. Cells were stained with ab10558 (1/200 dilution) for 30min at 4'C washed and then stained with goat anti-rabbit alexafluor 488 (1/200 dilution). Forward/Side scatter were used to eliminate cellular debris. The accompanying marker was applied such that only 2% of the IgG control was positive Based on the accompanying image approximately 8.4% of cells exhibited positive staining for anti-CD45. Since KM-H2 are known to have low levels of CD45 transcripts they are expected to have low levels of CD45 which is reflected in the ~8%. This image is from an Abreview.

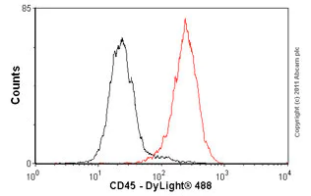


Lorenzi T et al., PLos One 7:e35232 (2012), Fig 4, doi: 10.1371/journal.pone.0035232 Reproduced under the Creative Commons license http://creativecommons.org/licenses/by/4.0/

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human tonsil tissue using rabbit Anti-CD45 antibody

ab10558 staining CD45 in Human tonsil tissue sections by Immunohistochemistry (IHC-P - paraformaldehyde-fixed, paraffin-embedded sections). Negative control is shown in panel. Blocking was with horse serum (1/75) for 1 hour at room temperature. Samples were incubated with primary antibody (1/10) overnight at 4°C. A Biotin-conjugated Horse anti-mouse polyclonal (1/200) was used as the secondary antibody.

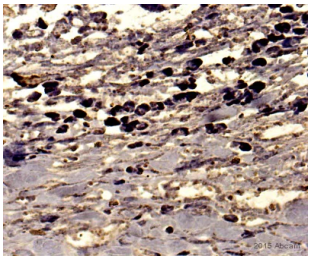


Flow Cytometry (Intracellular) - Anti-CD45 antibody (ab10558)

CD45 Flow Cytometry (Intracellular) staining of Jurkat cells using rabbit Anti-CD45 antibody

Overlay histogram showing Jurkat cells stained with ab10558 (red line). The cells were fixed with 80% methanol (5 min) and incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab10558 1µg/1x10^6 cells) for 30 min at 22°C. The secondary antibody used was DyLight® 488 goat anti-rabbit IgG (H+L) (ab96899) at 1/1000 dilution for 30 min at 22°C. Isotype control antibody (black line) was rabbit IgG (1µg/1x10^6 cells) used under the same conditions. Acquisition of >5000 events was performed.

Please note that Abcam do not have any data for use of this antibody on non-fixed cells. We welcome any customer feedback.

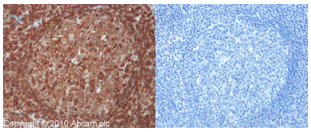


This image is courtesy of an anonymous customer review.

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human cephalic sections using rabbit Anti-CD45 antibody

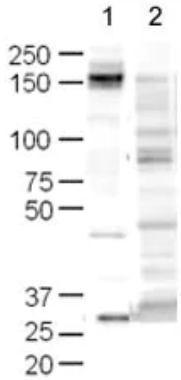
Immunohistochemical analysis of formaldehyde fixed human cephalic sections. Primary antibody ab10558 to CD45 incubated at a concentration of 1/100 for 4°C for 18 hours. Secondary antibody used was a goat anti-rabbit congugated to biotin at a 1/200 dilution. Blocking was done with serum at a 10% concentration for 1 hour at 25°C.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human tonsil using rabbit Anti-CD45 antibody

ab10558 (1:40 dilution) staining CD45 in paraffin-embedded human tonsil (left panel) using an automated system (Ventana Discovery). Right-hand panel shows negative control (no primary antibody).
Using this protocol there is strong membrane staining of B cells in the germinal centres and mantle zone of the follicles and scattered cells of the interfollicular areas (paracortical T and B cells). There is a mild to moderate degree of cytoplasmic staining associated with the membrane staining in these specific cells.
Sections were rehydrated and antigen retrieved in CC1 Cell Conditioning Buffer using Ventana Extended Retrieval programme. Slides were blocked in 3% H_2O_2 /4 min/ 37°C and incubated with ab10558 (1:40 dilution / 1 hour/ 37°C). Sections then blocked (4mins/ 37°C) and incubated with Dako swine anti-rabbit antibody (1:50 dilution, 28 min/ 37°C). Staining was amplified and detected by incubation with Ventana Streptavidin ABC (HRP-DAB) system (16 min/ 37°C) before being counterstained with hematoxylin.



Western blot - Anti-CD45 antibody (ab10558)

CD45 Western blot staining of Jurkat Whole Cell Lysate using rabbit Anti-CD45 antibody

Secondary antibody - goat anti-rabbit H&L (HRP) (ab6721)
All lanes:
Western blot - Anti-CD45 antibody (ab10558) at 1/500 dilution

Lane 1:
Jurkat Whole Cell Lysate at 20 µg

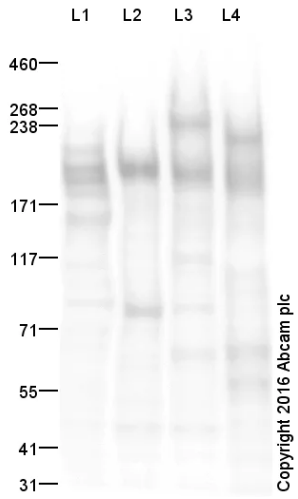
Lane 2:
Jurkat Whole Cell Lysate at 20 µg with Human CD45 peptide (ab17553)

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab6721) at 1/5000 dilution

Predicted band size: 147 kDa

Exposure time: 3min



Western blot - Anti-CD45 antibody (ab10558)

CD45 Western blot staining using rabbit Anti-CD45 antibody

This blot was produced using a 3-8% Tris Acetate gel under the TA buffer system. The gel was run at 150V for 60 minutes before being transferred onto a Nitrocellulose membrane at 30V for 70 minutes. The membrane was then blocked for an hour using 2% Bovine Serum Albumin before being incubated with ab10558 overnight at 4°C. Antibody binding was detected using an anti-rabbit antibody conjugated to HRP, and visualised using ECL development solution ab133406. CD45 contains a number of potential glycosylation sites (SwissProt) which may explain its migration at a higher molecular weight than predicted.

All lanes:
Western blot - Anti-CD45 antibody (ab10558) at 1 µg/mL

Lane 1:
Jurkat (Human) Whole Cell Lysate at 20 µg

Lane 2:
RAW 264.7 (Mouse leukaemic monocyte macrophage cell line) Whole Cell Lysate at 20 µg

Lane 3:
Spleen (Mouse) Tissue Lysate at 20 µg

Lane 4:
Spleen (Rat) Tissue Lysate at 20 µg

Secondary

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

Developed using the ECL technique.

Performed under reducing conditions.

Predicted band size: 147 kDa

Observed band size: 190 kDa, 230 kDa

Exposure time: 1min

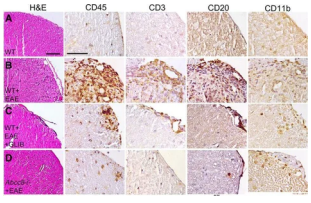


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Immunohistochemistry - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry staining using rabbit Anti-CD45 antibody

Immunohistochemistry using Anti-CD45 antibody, ab10558. Publication image from Gerzanich, V. et al., 2015, J Neuroinflammation, 26581714. Legend direct from paper.

Glibenclamide and Abcc8-/- suppress immune cell infiltration in EAE. a–d White matter of lumbar spinal cord sections from WT control (a), untreated pid-30 WT/EAE (b), glibenclamide-treated pid-30 WT/EAE (c), and pid-30 Abcc8-/-/EAE (d) mice, stained with H&E or immunolabeled for CD45 (leucocyte), CD3 (T cells), CD20 (B cells), or CD11b (macrophage/microglia), as indicated; original magnification, x200 (H&E) or x400 (all immunolabelings). eleft panel: percent of quadrants with inflammatory cells on H&E; four mice/group. efour right panels: Quantification of CD-45-, CD3-, CD20-, and CD11b-expressing cells in white matter; four mice/group; ##P<0.01 with respect to WT control; **P<0.01, and ***P<0.001 with respect to WT/EAE; scale bars, 100 µm.

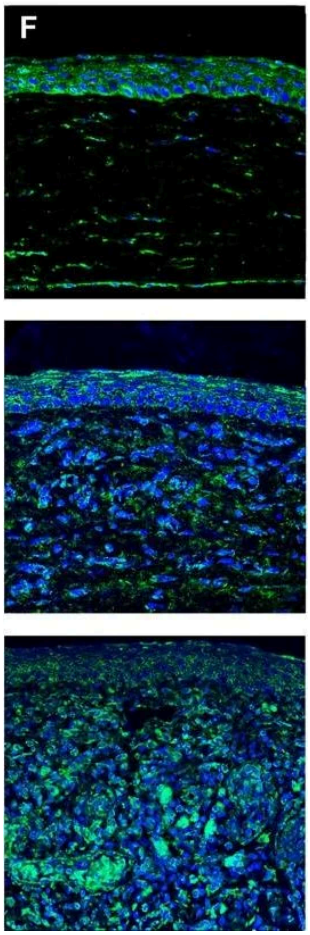


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Immunohistochemistry - Anti-CD45 antibody (ab10558)

Immunohistochemistry using Anti-CD45 antibody, ab10558. Publication image from Lachota, M. et al., 2018, Angiogenesis, 29332242. Legend direct from paper.

Histology and immunofluorescence in rat corneal sections. a Hematoxylin and Eosin (H&E), b VEGF-A (green); c CCL2 (green); d TNF-α (green); e CXCL5 (green); f CD45 (green) and g HIF-1α (green) staining in rat cornea tissue. Nuclear counterstaining by DAPI (blue) in fluorescent images.

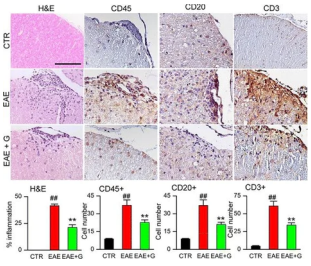


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Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-CD45 antibody (ab10558)

CD45 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-CD45 antibody

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) using Anti-CD45 antibody, ab10558. Publication image from Gerzanich, V. et al., 2017, J Neuroinflammation, 28865458. Legend direct from paper.

Chronic phase glibenclamide reduces the inflammatory burden in EAE. White matter of lumbar spinal cord sections from non-EAE control (CTR), untreated EAE mouse (EAE), and EAE mouse treated with glibenclamide starting on pid-24 (EAE + G), examined at pid-40, stained with H&E or immunolabeled for CD45 (leukocyte), CD20 (B cells), or CD3 (T cells), as indicated; original magnification, x200 (H&E) or x400 (all immunolabelings); bar graphs: percent of quadrants with inflammatory cells on H&E; quantification of CD45+, CD20+, and CD3+ cells in white matter; 5 mice/group; ##P < 0.01 with respect to non-EAE control (CTR); **P < 0.01 with respect to untreated EAE; scale bars 100 μm.

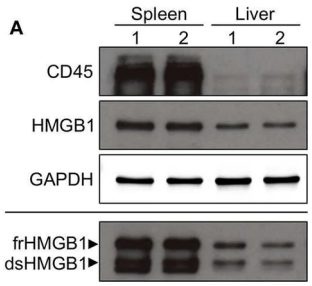


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Western blot - Anti-CD45 antibody (ab10558)

CD45 Western blot staining using rabbit Anti-CD45 antibody

Western Blotting using Anti-CD45 antibody, ab10558. Publication image from Ferrara, M. et al., 2020, Front Immunol, 32670275. Legend direct from paper.

Redox modulation of HMGB1 in spleen and in drug-intoxicated liver. (A) Western blot probed with anti-CD45, anti-HMGB1, and anti-GAPDH antibodies in reducing conditions (upper panels) or probed with anti-HMGB1 antibody in non-reducing conditions (lower panel) on lysates of spleen and liver isolated from control WT mice. In the lower panel, the upper band corresponds to the fully reduced-HMGB1 (frHMGB1) and the lower band to the disulphide-HMGB1 (dsHMGB1). (B,C) Quantification of total CD45 and HMGB1 protein levels normalized on GAPDH (B), and HMGB1 redox isoforms percentage (C) in spleen and liver lysates. A.U. = arbitrary unit (n = 4 mice/group). (D–G) Drug-induced liver injury (DILI) was induced by i.p. injection of acetaminophen (APAP), 300 mg/kg (body weight). Serum collection and necroscopy were performed at the indicated time points. (D) Representative images of DAPI and Evans Blue (EB) staining, Haematoxylin & Eosin (H&E) staining, and CD45 and HMGB1 immunostaining in liver sections from control mice (Ctrl) and at days 1, 2, 3, and 7 after DILI. Scale bars, 50 µm. (E) Alanine aminotransferase (sALT) and HMGB1 levels in serum before and after APAP injection in mice (n ≥ 5 mice/group). (F) Quantification of total number of intrahepatic leukocytes (IHLs) in control mice and at days 1 and 2 post-APAP injection (n = 4 mice/group). (G) Quantification of HMGB1 redox isoforms percentage, from Western blot assays performed in non-reducing conditions with anti-HMGB1 antibody, in IHLs isolated from control mice and at days 1 and 2 post-APAP injection (n = 4 mice/group). Data represent the means ± SEM and statistical significance was calculated by Student T-test (B), One-way (E,F) and Two-way ANOVA (C,G). ***p < 0.001; ****p < 0.0001; ns, not significant.

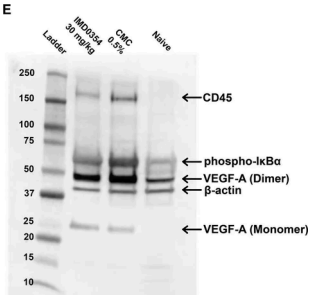


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Western blot - Anti-CD45 antibody (ab10558)

CD45 Western blot staining using rabbit Anti-CD45 antibody

Western Blotting using Anti-CD45 antibody, ab10558. Publication image from Lachota, M. et al., 2018, Angiogenesis, 29332242. Legend direct from paper.

Quantitative qRT-PCR and Western blot analysis of inflammatory and neovascular factors in suture-stimulated rat corneas at 96 h. Quantitative qRT-PCR analysis of aVegf-a, bCxcl5, cCcl2, and dCxcr2 expression in rat cornea. (n = 5) One-way ANOVA test with Tukey multiple comparisons were used to determine statistical significance. e Western blot analysis of CD45, phospho-IκBα and VEGF-A expression in rat cornea lysate. β-Actin used as a loading control. n.s. p > 0.05; *p < 0.05; **p < 0.01; ***p < 0.001.

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