abcam

ab2860

Anti-Calmodulin 1/2/3 antibody [2D1]

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	Preservative: 0.05% Sodium azide Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Clone number	2D1
Purification technique	Affinity purification Protein A
Specificity	This antibody detects calmodulin. It does not detect parvalbumin, tropinin, S-100, or myosin light chain kinase (MLCK).By Western blot, this antibody detects a 17 kDa protein representing calmodulin from Dictyostelium cell lysate. Immunohistochemical staining of calmodulin in Dictyostelium cells with this antibody results in staining of the contractile vacuoles.
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

Flow Cyt

Tested

Species	Human
Dilution info	2 µg for 10^6 Cells
Notes	Diution is only suitable for human reaction.

	ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Species	Rat
Dilution info	2 µg for 10^6 Cells
Notes	Diution is only suitable for human reaction. ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Expected

Species	Dictyostelium discoideum
Dilution info	2 µg for 10^6 Cells
Notes	Diution is only suitable for human reaction. ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Species	Mouse
Dilution info	2 µg for 10^6 Cells
Notes	Diution is only suitable for human reaction. ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Species	Chicken
Dilution info	2 µg for 10^6 Cells
Notes	Diution is only suitable for human reaction. ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Species	Cow
Dilution info	2 µg for 10^6 Cells
Notes	Diution is only suitable for human reaction. ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Predicted

Species	Wheat
Dilution info	-

Notes	-

IHC-P

Tested

Species	Rat
Dilution info	1/20 - 1/100
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Expected

Species	Dictyostelium discoideum
Dilution info	1/20 - 1/100
Notes	Perform heat-mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.

Species	Human
Dilution info	1/20 - 1/100
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Species	Cow
Dilution info	1/20 - 1/100
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Species	Chicken
Dilution info	1/20 - 1/100
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Predicted

Species	Wheat, Mouse
Dilution info	-

Notes	-

WB

Expected

Species	Dictyostelium discoideum
Dilution info	1/500
Notes	-

Species	Human
Dilution info	1/500
Notes	-

Species	Rat
Dilution info	1/500
Notes	-

Species	Mouse
Dilution info	1/500
Notes	-

Species	Chicken
Dilution info	1/500
Notes	-

Species	Cow
Dilution info	1/500
Notes	-

Predicted

Species	Wheat
Dilution info	-
Notes	-

ELISA

Expected

Species	Dictyostelium discoideum, Rat, Human, Mouse, Chicken, Cow
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Wheat
Dilution info	-
Notes	-

IP

Expected

Species	Dictyostelium discoideum, Mouse, Human, Rat, Chicken, Cow
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Wheat
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Rat
Dilution info	1/50
Notes	-

Species	Human
Dilution info	1/50

Notes	-

Expected

Species	Dictyostelium discoideum
Dilution info	1/50
Notes	-

Species	Mouse
Dilution info	1/50
Notes	-

Species	Cow
Dilution info	1/50
Notes	-

Species	Chicken
Dilution info	1/50
Notes	-

Predicted

Species	Wheat
Dilution info	-
Notes	-

Target data

See full target information CALM1

Function	Calmodulin acts as part of a calcium signal transduction pathway by mediating the control of a large number of enzymes, ion channels, aquaporins and other proteins through calcium-binding (PubMed:16760425, PubMed:23893133, PubMed:26969752, PubMed:27165696, PubMed:28890335, PubMed:31454269, PubMed:35568036). Calcium-binding is required for the activation of calmodulin (PubMed:16760425, PubMed:23893133, PubMed:26969752, PubMed:27165696, PubMed:28890335, PubMed:31454269, PubMed:35568036). Among the enzymes to be stimulated by the calmodulin-calcium complex are a number of protein kinases, such as myosin light-chain kinases and calmodulin-dependent protein kinase type

II (CaMK2), and phosphatases (PubMed:16760425, PubMed:23893133, PubMed:26969752, PubMed:27165696, PubMed:28890335, PubMed:31454269, PubMed:35568036). Together with CCP110 and centrin, is involved in a genetic pathway that regulates the centrosome cycle and progression through cytokinesis (PubMed:16760425). Is a regulator of voltage-dependent L-type calcium channels (PubMed:31454269). Mediates calcium-dependent inactivation of CACNA1C (PubMed:26969752). Positively regulates calcium-activated potassium channel activity of KCNN2 (PubMed:27165696). Forms a potassium channel complex with KCNQ1 and regulates electrophysiological activity of the channel via calcium-binding (PubMed:25441029). Acts as a sensor to modulate the endoplasmic reticulum contacts with other organelles mediated by VMP1:ATP2A2 (PubMed:28890335). (Microbial infection) Required for Legionella pneumophila SidJ glutamylase activity. (Microbial infection) Required for C.violaceum CopC and S.flexneri OspC3 arginine ADP-riboxanase activity.

Storage

Shipped at conditions	Blue Ice
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

Supplementary info

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

Activity summary	Calmodulin also known as calmoduline is a multifunctional intermediate calcium-binding protein expressed widely in eukaryotic cells. This small protein has a molecular weight of approximately 16.7 kDa. Calmodulin 1 2 and 3 serve as the key isoforms facilitating a variety of calcium-mediated processes. You can find it in cellular contexts where calcium signaling plays a regulatory role. Due to its ubiquity it acts as a mediator in numerous cellular responses.
Biological function summary	Calmodulin modulates intracellular activities by binding to calcium ions and interacting with a wide array of target proteins. It is not part of a molecular complex but can partner with proteins like kinases and phosphatases leading to downstream effects on diverse cellular processes. Calmodulin function extends to muscle contraction cell division and signal transduction impacting both basal and specialized cellular functions.

Pathways	Calmodulin operates as a functional link in calcium signaling and the MAPK signaling pathways. In these pathways calmodulin influences the activity of proteins such as myosin light-chain kinase and calmodulin-dependent protein kinase. These interactions showcase calmodulin's pivotal role in translating calcium signaling into cellular responses connecting several signaling cascades.
Associated diseases and disorders	Calmodulin has associations with certain cardiovascular diseases and neurodegenerative conditions. Its relationship with ion channel dysfunction links it to disorders like long QT syndrome. Additionally calmodulin interacts with proteins like sodium-calcium exchangers or other ion-handling channels reflecting its involvement in maintaining cellular ionic balance and consequently its implication in pathological states when dysregulated.

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

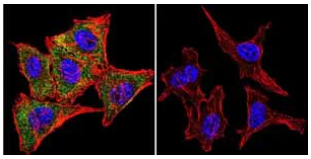
We do not recommend this combination. It is not covered by our product promise.

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.

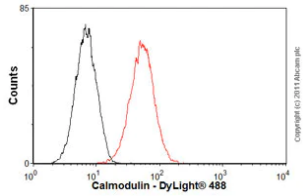
10 product images



Immunocytochemistry/ Immunofluorescence - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

Calmodulin 1/2/3 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-Calmodulin 1/2/3 antibody

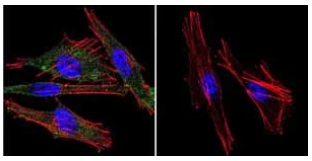
Immunofluorescent analysis of HeLa (Human epithelial cell line from cervix adenocarcinoma) cells labeling Calmodulin with ab2860. Calmodulin staining (green) F-Actin staining with Phalloidin (red) and nuclei with DAPI (blue) is shown. Cells were grown on chamber slides and fixed with formaldehyde prior to staining. Cells were probed without (control) or with or an antibody recognizing Calmodulin ab2860 at a dilution of 1:50 over night at 4 °C washed with PBS and incubated with a DyLight-488 conjugated secondary antibody. Images were taken at 60X magnification.



Flow Cytometry - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

Calmodulin 1/2/3 Flow Cytometry staining using mouse Anti-Calmodulin 1/2/3 antibody

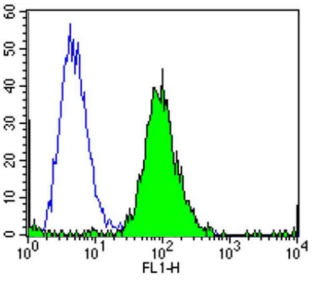
Overlay histogram showing HeLa cells stained with ab2860 (red line). The cells were fixed with 80% methanol (5 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab2860, 2µg/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 IgG1 [ICIGG1] (ab91353, 2µg/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was performed.



Immunocytochemistry/ Immunofluorescence - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

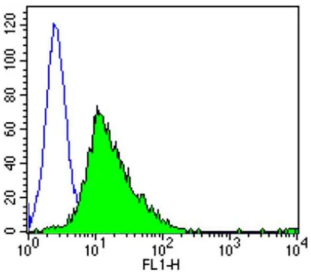
Calmodulin 1/2/3 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-Calmodulin 1/2/3 antibody

Immunofluorescent analysis of A2058 (Human metastatic melanoma cell line) cells labeling Calmodulin ab2860. Calmodulin staining (green) F-Actin staining with Phalloidin (red) and nuclei with DAPI (blue) is shown. Cells were grown on chamber slides and fixed with formaldehyde prior to staining. Cells were probed without (control) or with or an antibody recognizing Calmodulin ab2860 at a dilution of 1:50 over night at 4 °C washed with PBS and incubated with a DyLight-488 conjugated secondary antibody. Images were taken at 60X magnification.



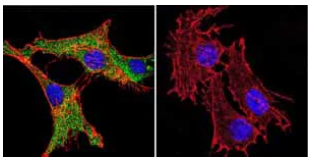
Flow Cytometry - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

Flow cytometry analysis of Calmodulin showing positive staining in the cytoplasm of MCF7 (Human breast adenocarcinoma cell line) cells compared to an isotype control (blue). Cells were harvested and adjusted to a concentration of 1-5x10^6 cells/ml. Cells were then fixed with 2% paraformaldehyde and washed with PBS. Cells were penetrated by dropping the supernatant and adding 90% methanol followed by incubation for 10 minutes at room temperature. Cells were blocked with a 2% solution of BSA-PBS for 30 min at room temperature and incubated with ab2860 at a dilution of 2 ug/test for 60 min at room temperature. Cells were then incubated for 40 min at room temperature in the dark using a Dylight 488-conjugated goat anti-mouse IgG (H+L) secondary antibody and re-suspended in PBS for FACS analysis.



Flow Cytometry - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

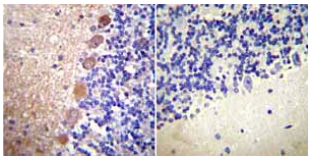
Flow cytometry analysis of Calmodulin showing positive staining in the cytoplasm of PC-12 (Rat adrenal gland pheochromocytoma cell line) cells compared to an isotype control (blue). Cells were harvested and adjusted to a concentration of 1-5x10^6 cells/ml. Cells were then fixed with 2% paraformaldehyde and washed with PBS. Cells were penetrated by dropping the supernatant and adding 90% methanol followed by incubation for 10 minutes at room temperature. Cells were blocked with a 2% solution of BSA-PBS for 30 min at room temperature and incubated with ab2860 at 2 ug/test for 60 min at room temperature. Cells were then incubated for 40 min at room temperature in the dark using a Dylight 488-conjugated goat anti-mouse IgG (H+L) secondary antibody and re-suspended in PBS for FACS analysis.



Immunocytochemistry/ Immunofluorescence - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

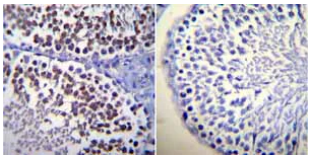
Calmodulin 1/2/3 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-Calmodulin 1/2/3 antibody

Immunofluorescent analysis of C6 (Rat glial tumor cell line) cells labeling Calmodulin ab2860. Calmodulin staining (green) F-Actin staining with Phalloidin (red) and nuclei with DAPI (blue) is shown. Cells were grown on chamber slides and fixed with formaldehyde prior to staining. Cells were probed without (control) or with or an antibody recognizing Calmodulin ab2860 at a dilution of 1:50 over night at 4 °C washed with PBS and incubated with a DyLight-488 conjugated secondary antibody. Images were taken at 60X magnification.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

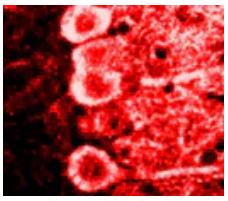
Immunohistochemistry was performed on normal biopsies of deparaffinized rat cerebellum tissue. To expose target proteins heat induced antigen retrieval was performed using 10mM sodium citrate (pH6.0) buffer microwaved for 8-15 minutes. Following antigen retrieval tissues were blocked in 3% BSA-PBS for 30 minutes at room temperature. Tissues were then probed at a dilution of 1:20 with a mouse monoclonal antibody recognizing Calmodulin ab2860 or without primary antibody (negative control) overnight at 4°C in a humidified chamber. Tissues were washed extensively with PBST and endogenous peroxidase activity was quenched with a peroxidase suppressor. Detection was performed using a biotin-conjugated secondary antibody and SA-HRP followed by colorimetric detection using DAB. Tissues were counterstained with hematoxylin and prepped for mounting.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

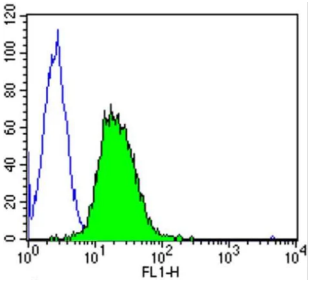
Immunohistochemistry was performed on normal biopsies of deparaffinized rat testis tissue. To expose target proteins heat induced antigen retrieval was performed using 10mM sodium citrate (pH6.0) buffer microwaved for 8-15 minutes. Following antigen retrieval tissues were blocked in 3% BSA-PBS for 30 minutes at room temperature. Tissues were then probed at a dilution of 1:20 with a mouse monoclonal antibody recognizing Calmodulin ab2860 or without primary antibody (negative control) overnight at 4°C in a humidified chamber. Tissues were washed extensively with PBST and endogenous peroxidase activity was quenched with a peroxidase suppressor. Detection was performed using a biotin-conjugated secondary antibody and SA-HRP followed by colorimetric detection using DAB. Tissues were counterstained with hematoxylin and prepped for

mounting.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

Immunolocalization of calmodulin in rat brain cells using ab2860 (1:100)



Flow Cytometry - Anti-Calmodulin 1/2/3 antibody [2D1] (ab2860)

Flow cytometry analysis of Calmodulin showing positive staining in the cytoplasm of C6 (Rat glial tumor cell line) cells compared to an isotype control (blue). Cells were harvested and adjusted to a concentration of 1-5x10^6 cells/ml. Cells were then fixed with 2% paraformaldehyde and washed with PBS. Cells were penetrated by dropping the supernatant and adding 90% methanol followed by incubation for 10 minutes at room temperature. Cells were blocked with a 2% solution of BSA-PBS for 30 min at room temperature and incubated with ab2860 at 2 ug/test for 60 min at room temperature. Cells were then incubated for 40 min at room temperature in the dark using a Dylight 488-conjugated goat anti-mouse IgG (H+L) secondary antibody and re-suspended in PBS for FACS analysis.

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