abcam

ab47455

Anti-Hsp70 antibody [C92F3A-5]

Mouse Monoclonal Hsp70(HSPA1A)antibody. Suitable for Flow Cyt, WB, IHC-P and reacts with Human, Mouse, Rat samples. Cited in 47 publications. Immunogen corresponding to Recombinant Fragment Protein within Human HSPA1A aa 400-550.

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	Preservative: 0.1% Sodium azide Constituents: PBS, 50% Glycerol (glycerin, glycerine)
Form	Liquid
Clonality	Monoclonal
Immunogen	Recombinant Fragment Protein within Human HSPA1A aa 400-550. The exact immunogen used to generate this antibody is proprietary information. Database link P0DMV8
Clone number	C92F3A-5
Purification technique	Affinity purification Protein G
Specificity	Detects a 70kDa protein corresponding to the molecular mass of Hsp70 of SDS PAGE immunoblots. There is no cross-reactivity to Hsc70 (Hsp73).
Epitope	The mapped epitope is in the region of amino acid residues 436-503.
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	1/1000
Notes	ab170190 - Mouse monoclonal IgG1, 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	Cow, Dog, Pig, Caenorhabditis elegans, Macaque monkey, Bos mutus grunniens, Saguinus oedipus, Onchocerca volvulus, Chinook salmon
Dilution info	-
Notes	-

WB

Tested

Species	Mouse
Dilution info	1/1000
Notes	-

Species	Rat
Dilution info	1/1000
Notes	-

Species	Human
Dilution info	1/1000
Notes	-

Predicted

Species	Cow, Dog, Pig, Caenorhabditis elegans, Macaque monkey, Bos mutus grunniens, Saguinus oedipus, Onchocerca volvulus, Chinook salmon
Dilution info	-
Notes	-

IHC-P

Tested

Species	Human
Dilution info	1/10000
Notes	-

Expected

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

Predicted

Species	Cow, Dog, Pig, Caenorhabditis elegans, Macaque monkey, Bos mutus grunniens, Saguinus oedipus, Onchocerca volvulus, Chinook salmon
Dilution info	-
Notes	-

Target data

See full target information HSPA1A

Function Molecular chaperone implicated in a wide variety of cellular processes, including protection of the proteome from stress, folding and transport of newly synthesized polypeptides, activation of proteolysis of misfolded proteins and the formation and dissociation of protein complexes. Plays a pivotal role in the protein quality control system, ensuring the correct folding of proteins, the re-folding of misfolded proteins and controlling the targeting of proteins for subsequent degradation. This is achieved through cycles of ATP binding, ATP hydrolysis and ADP release, mediated by co-chaperones. The co-chaperones have been shown to not only regulate different steps of the ATPase cycle, but they also have an individual specificity such that one co-chaperone may promote folding of a

substrate while another may promote degradation. The affinity for polypeptides is regulated by its nucleotide bound state. In the ATP-bound form, it has a low affinity for substrate proteins. However, upon hydrolysis of the ATP to ADP, it undergoes a conformational change that increases its affinity for substrate proteins. It goes through repeated cycles of ATP hydrolysis and nucleotide exchange, which permits cycles of substrate binding and release. The co-chaperones are of three types: J-domain co-chaperones such as HSP40s (stimulate ATPase hydrolysis by HSP70), the nucleotide exchange factors (NEF) such as BAG1/2/3 (facilitate conversion of HSP70 from the ADP-bound to the ATP-bound state thereby promoting substrate release), and the TPR domain chaperones such as HOPX and STUB1 (PubMed:24012426, PubMed:24318877, PubMed:26865365). Maintains protein homeostasis during cellular stress through two opposing mechanisms: protein refolding and degradation. Its acetylation/deacetylation state determines whether it functions in protein refolding or protein degradation by controlling the competitive binding of co-chaperones HOPX and STUB1. During the early stress response, the acetylated form binds to HOPX which assists in chaperone-mediated protein refolding, thereafter, it is deacetylated and binds to ubiquitin ligase STUB1 that promotes ubiquitin-mediated protein degradation (PubMed:27708256). Regulates centrosome integrity during mitosis, and is required for the maintenance of a functional mitotic centrosome that supports the assembly of a bipolar mitotic spindle (PubMed:27137183). Enhances STUB1-mediated SMAD3 ubiquitination and degradation and facilitates STUB1-mediated inhibition of TGF-beta signaling (PubMed:24613385). Essential for STUB1-mediated ubiquitination and degradation of FOXP3 in regulatory T-cells (Treg) during inflammation (PubMed:23973223). Required as a co-chaperone for optimal STUB1/CHIP ubiquitination of NFATC3 (By similarity). Negatively regulates heat shock-induced HSF1 transcriptional activity during the attenuation and recovery phase period of the heat shock response (PubMed:9499401). Involved in the clearance of misfolded PRDM1/Blimp-1 proteins. Sequesters them in the cytoplasm and promotes their association with SYNV1/HRD1, leading to proteasomal degradation (PubMed:28842558). (Microbial infection) In case of rotavirus A infection, serves as a post-attachment receptor for the virus to facilitate entry into the cell.

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	Hsp70 also known as Heat Shock Protein 70 or HSPA1B is a molecular chaperone with a mass of approximately 70 kDa. It plays a mechanical role by assisting in the proper folding of nascent polypeptide chains and the refolding of misfolded proteins. Researchers often detect Hsp70 using Western blot and immunohistochemistry (IHC) techniques. Hsp70 is widely expressed in many tissues particularly during stress conditions like heat shock where its expression level increases significantly.
Biological function summary	Hsp70 operates by stabilizing intermediate states of folding proteins preventing aggregation and facilitating the correct folding process. It often forms a complex with co-chaperones such as Hsp40 and nucleotide exchange factors. This complex is essential for the protein's activity and function. Additionally Hsp70 participates in protein degradation pathways by guiding misfolded proteins to the proteasome for degradation maintaining cellular homeostasis.
Pathways	This molecular chaperone plays significant roles in the heat shock response and unfolded protein response pathways. Hsp70 interacts closely with proteins such as Hsp90 and co-chaperones which together help protect cells from stress-induced damage. The protein also participates in the JAK/STAT signaling pathway influencing cell proliferation and apoptosis. These interactions suggest an integral role in maintaining cellular integrity during stress conditions.
Associated diseases and disorders	Overexpression of Hsp70 has been associated with various cancers and neurodegenerative diseases. In cancer Hsp70 helps tumor cells survive the hostile tumor microenvironment partly by interacting with anti-apoptotic proteins such as Bcl-2. In neurodegenerative disorders such as Alzheimer's disease Hsp70 associates with amyloid-beta peptides potentially mitigating their aggregation toxicity. These interactions highlight Hsp70's importance in both protective and pathological cellular processes.

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

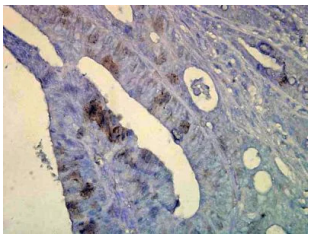
We do not recommend this combination. It is not covered by our product promise.

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.

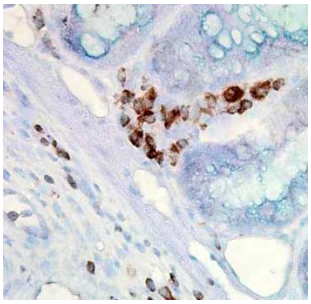
6 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Hsp70 antibody [C92F3A-5] (ab47455)

Hsp70 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-Hsp70 antibody

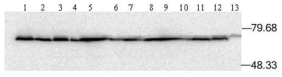
Formalin-fixed, paraffin-embedded human colon carcinoma tissue stained for Hsp70 using ab47455 at 1/1000 dilution in immunohistochemical analysis. Counter stained with hematoxylin.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Hsp70 antibody [C92F3A-5] (ab47455)

Hsp70 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-Hsp70 antibody

ab47455 staining Hsp70 in mouse colon cancer tissue section by Immunohistochemistry (Bouin's fixed paraffin embedded tissue sections). The primary antibody was diluted at 1/100,000. A Fluorophore conjugated goat anti mouse was used as secondary. An antibody amplifier™ system was used for staining.



Western blot - Anti-Hsp70 antibody [C92F3A-5] (ab47455)

Hsp70 Western blot staining using mouse Anti-Hsp70 antibody

All are cancer cell lines.
All lanes:
Western blot - Anti-Hsp70 antibody [C92F3A-5] (ab47455) at 1 µg/mL

Lane 1:
Cell lysate prepared from human A431 cell line

Lane 2:
Cell lysate prepared from human A549 cell line

Lane 3:
Cell lysate prepared from human HCT116 cells line

Lane 4:
Cell lysate prepared from human Hela cell line

Lane 5:
Cell lysate prepared from human HEK293 cell line

Lane 6:
Cell lysate prepared from human HepG2 cell line

Lane 7:
Cell lysate prepared from human HL-60 cell line

Lane 8:
Cell lysate prepared from human HUVEC cell line

Lane 9:
Cell lysate prepared from human Jurkat cell line

Lane 10:
Cell lysate prepared from human MCF7 cell line

Lane 11:
Cell lysate prepared from human PC3 cell line

Lane 12:
Cell lysate prepared from human T98G cell line

Lane 13:
Rat brain tissue lysates

Predicted band size: 70 kDa

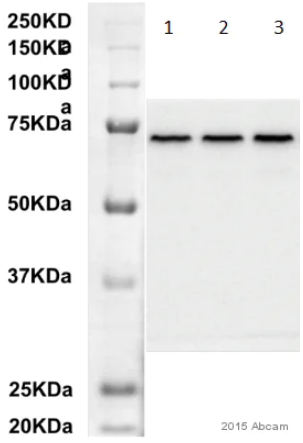


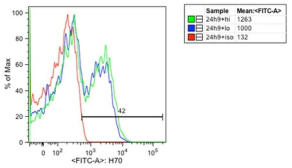
Image courtesy of an anonymous customer review

Western blot - Anti-Hsp70 antibody [C92F3A-5] (ab47455)

All lanes:
Western blot - Anti-Hsp70 antibody [C92F3A-5] (ab47455) at 1/500 dilution

All lanes:
Rat bone (tibia) whole cell lysate at 50 µg

Predicted band size: 70 kDa



FACS analysis. Anti-Hsp70-FITC staining on heat shock treated CD3+CD8+ T cells

Flow Cytometry - Anti-Hsp70 antibody [C92F3A-5] (ab47455)

FACS analysis using ab47455 staining heat shock treated CD3 + CD8 + T cells.

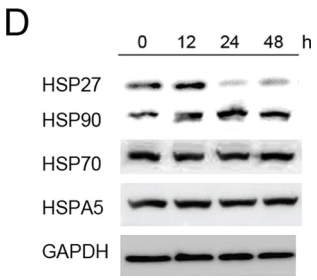


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Western blot - Anti-Hsp70 antibody [C92F3A-5] (ab47455)

Hsp70 Western blot staining using mouse Anti-Hsp70 antibody

Hsp70 western blot using anti-Hsp70 antibody [C92F3A-5] ab47455. Publication image and figure legend from Cheng, Y. C., Huang, C. J., et al., 2016, Sci Rep, PubMed 27444754.

ab47455 was used in this publication in western blot. This may not be the same as the application(s) guaranteed by Abcam. For a full list of applications guaranteed by Abcam for ab47455 please see the product overview.

Cell model and expression profiles of HSP27 in neurons differentiated from PDMCs.(A) Cell morphology showing the differentiation of neurons derived from PDMCs. Phase contrast images of PDMCs (left upper panel) and neuron-like cells induced by IBMX (left lower panel). Immunocytochemistry analysis of PDMCs (right upper panel) and differentiated neuron-like cells using anti-NSE antibody (right lower panel). Induced neurons extended neurites and formed synaptic connections with each other (red arrowheads). Scale bar = 100 μm. (B) Temporal expression of HSP27 protein in the study model was profiled using 2D-PAGE. PDMCs were harvested at the indicated time points after treatment with IBMX. The proteins at each time point were profiled using 2-DE-PAGE. Cell extracts (300 μg) from each time point were separately subjected to the 2-DE procedure, and protein spots were visualized with silver staining. The rectangle represents the location of HSP27 in 2D-PAGE images. The HSP27 expression level in each 2-DE-PAGE was selected, marked by a cross and indicated with arrows, showing that the protein expression of HSP27 at different time points decreased after IBMX induction (right panel). (C) qPCR analysis of mRNA expression in the PDMCs after IBMX induction. Each time point was evaluated in five independent experiments. The star indicates statistical significance with p value < 0.05. (D) Immunoblots for HSP27, HSP90, HSP70 and HSPA5 after IBMX induction of PDMCs. Cell extracts (30 μg) were prepared from induced PDMCs at the indicated time points (0, 12, 24 and 48 h). GAPDH was used as an internal control.

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