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Monoclonal Antibody to Heat shock protein 70 / HSP70 - FITC

Alternate names: HSP70-1/HSP70-2, HSP70.1, HSPA1, HSPA1A, HSPA1B, Heat shock 70 kDa protein 1A/1B

Catalog No.: AM03139FC-N

Quantity: 50 µg

Concentration: 1.7 mg/ml

Background: Hsp70 genes encode abundant heat-inducible 70-kDa hsps (hsp70s). In most eukaryotes hsp70 genes exist as part of a multigene family. They are found in most cellular compartments of eukaryotes including nuclei, mitochondria, chloroplasts, the endoplasmic reticulum and the cytosol, as well as in bacteria. The genes show a high degree of conservation, having at least 50% identity (2). The N-terminal two thirds of hsp70s are more conserved than the C-terminal third. Hsp70 binds ATP with high affinity and possesses a weak ATPase activity which can be stimulated by binding to unfolded proteins and synthetic peptides (3). When hsc70 (constitutively expressed) present in mammalian cells was truncated, ATP binding activity was found to reside in an N-terminal fragment of 44 kDa which lacked peptide binding capacity. Polypeptide binding ability therefore resided within the C-terminal half (4). The structure of this ATP binding domain displays multiple features of nucleotide binding proteins (5). All hsp70s, regardless of location, bind proteins, particularly unfolded ones. The molecular chaperones of the hsp70 family recognize and bind to nascent polypeptide chains as well as partially folded intermediates of proteins preventing their aggregation and misfolding. The binding of ATP triggers a critical conformational change leading to the release of the bound substrate protein (6). The universal ability of hsp70s to undergo cycles of binding to and release from hydrophobic stretches of partially unfolded proteins determines their role in a great variety of vital intracellular functions such as protein synthesis, protein folding and oligomerization and protein transport.

Uniprot ID: P08107

NCBI: NP_005336.3

GeneID: 3303

Host / Isotype: Mouse / IgG1

Recommended Isotype Controls: SM10F (for use in human samples), SM20F (for use in rat samples)

Clone: C92F3A-5

Immunogen: Human HSP70 (Ref.1).

Format:

State: Liquid purified IgG fraction
Purification: Affinity Chromatography on Protein G
Buffer System: PBS, pH 7.2
Preservatives: 0.01% Sodium Azide
Stabilizers: 50% Glycerol
Label: FITC

Applications:

Flow Cytometry.
1/1,000 dilution of this antibody was sufficient for detection of HSP70 in Human Jurkat cells by FACS anaylsis.
Other applications not tested. Optimal dilutions are dependent on conditions and should be determined by the user.

Specificity:

This antibody detects a ~70 kDa protein corresponding to the Molecular Mass of inducible HSP70 on SDS PAGE Immunoblots.
The mapped epitope is in the region of amino acid residues 436-503.
Does not cross-react with HSC70 (HSP73).
Species: Human, Mouse, Rat, Bovine, Canine, Chicken, Drosophila, Fish (carp), Guinea Pig, Hamster, Monkey, Pig, Rabbit and Sheep.
Other species not tested.

Storage:

Store undiluted at 2-8°C.
This product is photosensitive and should be protected from light.
Shelf life: one year from despatch.

Product Citations:

Originator or purchased from resellers:

1. Guess AJ, Ayoob R, Chanley M, Manley J, Cajaiba MM, Agrawal S, et al. Crucial roles of the protein kinases MK2 and MK3 in a mouse model of glomerulonephritis. PLoS One. 2013;8(1):e54239. doi: 10.1371/journal.pone.0054239. Epub 2013 Jan 23. PubMed PMID: 23372691.
2. Bauckman KA, Haller E, Flores I, Nanjundan M. Iron modulates cell survival in a Ras- and MAPK-dependent manner in ovarian cells. Cell Death Dis. 2013 Apr 18;4:e592. doi: 10.1038/cddis.2013.87. PubMed PMID: 23598404.
3. Aare S, Radell P, Eriksson LI, Akkad H, Chen YW, Hoffman EP, et al. Effects of corticosteroids in the development of limb muscle weakness in a porcine intensive care unit model. Physiol Genomics. 2013 Apr 16;45(8):312-20. doi: 10.1152/physiolgenomics.00123.2012. Epub 2013 Feb 19. PubMed PMID: 23429211.

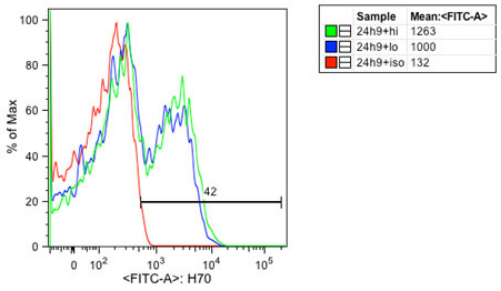
General Readings:

1. Welch WJ, Suhan JP. Cellular and biochemical events in mammalian cells during and after recovery from physiological stress. J Cell Biol. 1986 Nov;103(5):2035-52. PubMed PMID: 3536957.
2. Boorstein W. R., Ziegelhoffer T. & Craig E. A. (1993) J. Mol. Evol. 38(1): 1-17.
3. Rothman JE. Polypeptide chain binding proteins: catalysts of protein folding and related processes in cells. Cell. 1989 Nov 17;59(4):591-601. PubMed PMID: 2573430.
4. DeLuca-Flaherty C, McKay DB, Parham P, Hill BL. Uncoating protein (hsc70) binds a conformationally labile domain of clathrin light chain LCa to stimulate ATP hydrolysis. Cell. 1990 Sep 7;62(5):875-87. PubMed PMID: 1975516.
5. Bork P, Sander C, Valencia A. An ATPase domain common to prokaryotic cell cycle proteins, sugar kinases, actin, and hsp70 heat shock proteins. Proc Natl Acad Sci U S A. 1992 Aug 15;89(16):7290-4. PubMed PMID: 1323828.
6. Fink AL. Chaperone-mediated protein folding. Physiol Rev. 1999 Apr;79(2):425-49. PubMed PMID: 10221986.
7. Galán A, García-Bermejo ML, Troyano A, Vilaboa NE, de Blas E, Kazanietz MG, et al. Stimulation of p38 mitogen-activated protein kinase is an early regulatory event for the cadmium-induced apoptosis in human promonocytic cells. J Biol Chem. 2000 Apr 14;275(15):11418-24. PubMed PMID: 10753958.

8. Kondo T, Matsuda T, Tashima M, Umehara H, Domae N, Yokoyama K, et al. Suppression of heat shock protein-70 by ceramide in heat shock-induced HL-60 cell apoptosis. J Biol Chem. 2000 Mar 24;275(12):8872-9. PubMed PMID: 10722733.
9. Misaki T, Takeuchi R, Miyamoto S, Hirano A, Kasagi K, Konishi J. Induction in vitro of 72-kD heat shock protein in a continuous culture of rat thyroid cells, FRTL5. Clin Exp Immunol. 1994 Nov;98(2):234-9. PubMed PMID: 7955528.
10. Pockley AG, Shepherd J, Corton JM. Detection of heat shock protein 70 (Hsp70) and anti-Hsp70 antibodies in the serum of normal individuals. Immunol Invest. 1998 Dec;27(6):367-77. PubMed PMID: 9845422.
11. Moon IS, Park IS, Schenker LT, Kennedy MB, Moon JI, Jin I. Presence of both constitutive and inducible forms of heat shock protein 70 in the cerebral cortex and hippocampal synapses. Cereb Cortex. 2001 Mar;11(3):238-48. PubMed PMID: 11230095.
12. Dressel R, Elsner L, Quentin T, Walter L, Günther E. Heat shock protein 70 is able to prevent heat shock-induced resistance of target cells to CTL. J Immunol. 2000 Mar 1;164(5):2362-71. PubMed PMID: 10679071.
13. Verma AK, Pal AK, Manush SM, Das T, Dalvi RS, Chandrachoodan PP, et al. Persistent sub-lethal chlorine exposure augments temperature induced immunosuppression in Cyprinus carpio advanced fingerlings. Fish Shellfish Immunol. 2007 May;22(5):547-55. Epub 2006 Aug 16. PubMed PMID: 17046286.
14. Banduseela VC, Ochala J, Chen YW, Göransson H, Norman H, Radell P, et al. Gene expression and muscle fiber function in a porcine ICU model. Physiol Genomics. 2009 Nov 6;39(3):141-59. doi: 10.1152/physiolgenomics.00026.2009. Epub 2009 Aug 25. PubMed PMID: 19706692.

Pictures:

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



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