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Polyclonal Antibody to Heat shock protein 70 / HSP70 - Serum

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

Catalog No.: AP03018SU-N

Quantity: 0.1 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 (1, 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

GeneID: 3303

Host: Rabbit

Immunogen: Full length Human protein HSP70

Format: **State:** Whole rabbit Liquid serum

Applications: **ELISA.**
Western blot 1/25,000 (ECL) (Ref.7-9).
A 1/10,000 dilution of this antibody was sufficient for detection of hsp70 in 20µg of HeLa cell lysate by ECL immunoblot analysis.
Immunoprecipitation: 1/100 (Ref.9,10).
Immunofluorescence.

For research and in vitro use only. Not for diagnostic or therapeutic work.
Material Safety Datasheets are available at www.acris-antibodies.com or on request.

Acris Antibodies is now part of the OriGene family. Learn more at www.origene.com

Immunohistochemistry on Frozen Sections.
Immunohistochemistry on Paraffin Sections.
Other applications not tested. Optimal dilutions are dependent on conditions and should be determined by the user.

Specificity:

Detects a 70kDa protein corresponding to the molecular mass of inducible hsp70 on SDS PAGE immunoblots. May cross-react with Hsc70 at lower dilutions.
Species: Human, Mouse, Rat, Beluga, Cow, Dog, Fish (carp), Guinea Pig, Hamster, Monkey, Pig, Sheep, Coral, Tomato, Tobacco, Spiny dogfish shark (Squalus acanthias), Atlantic Hagfish (Myxine glutinosa), Rainbow Trout.
Other species not tested.

Storage:

Store undiluted at 2-8°C for one month or (in aliquots) at -20°C for longer.
Avoid repeated freezing and thawing.
Shelf life: one year from despatch.

Product Citations:

Originator or purchased from resellers:
1. Silverstein MG, Ordanes D, Wylie AT, Files DC, Milligan C, Presley TD, et al. Inducing Muscle Heat Shock Protein 70 Improves Insulin Sensitivity and Muscular Performance in Aged Mice. J Gerontol A Biol Sci Med Sci. 2015 Jul;70(7):800-8. doi: 10.1093/gerona/glu119. Epub 2014 Aug 14. PubMed PMID: 25123646.

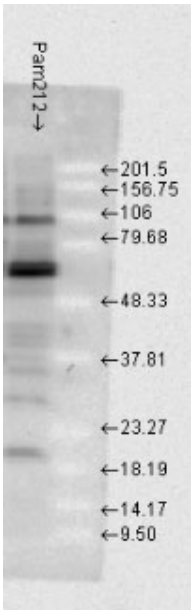
General Readings:

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. Hung TH, Skepper JN, Burton GJ. In vitro ischemia-reperfusion injury in term human placenta as a model for oxidative stress in pathological pregnancies. Am J Pathol. 2001 Sep;159(3):1031-43. PubMed PMID: 11549595.
8. Locke M. Heat shock transcription factor activation and hsp72 accumulation in aged skeletal muscle. Cell Stress Chaperones. 2000 Jan;5(1):45-51. PubMed PMID: 10701839.
9. Ianaro A, Ialenti A, Maffia P, Pisano B, Di Rosa M. Role of cyclopentenone prostaglandins in rat carrageenin pleurisy. FEBS Lett. 2001 Nov 9;508(1):61-6. PubMed PMID: 11707269.
10. Trentin GA, Yin X, Tahir S, Lhotak S, Farhang-Fallah J, Li Y, et al. A mouse homologue of the Drosophila tumor suppressor l(2)tid gene defines a novel Ras GTPase-activating protein (RasGAP)-binding protein. J Biol Chem. 2001 Apr 20;276(16):13087-95. Epub 2000 Dec 14. PubMed PMID: 11116152.
11. Anne Bailey and Lorne J. Hofseth. A method to enhance the sensitivity and reproducibility of immunohistochemistry http://www.prohisto.com/pdfs/Hofseth_Manuscript-81.pdf.
12. Ings JS, Oakes KD, Vijayan MM, Servos MR. Temporal changes in stress and tissue-specific metabolic responses to municipal wastewater effluent exposure in rainbow trout. Comp Biochem Physiol C Toxicol Pharmacol. 2012 Aug;156(2):67-74. doi: 10.1016/j.cbpc.2012.04.002. Epub 2012 May 1. PubMed PMID: 22579662.
13. Donglei Zhang, Fabiana Ciciriello, Suzana M. Anjos, Annamaria Carissimo, Jie Liao,

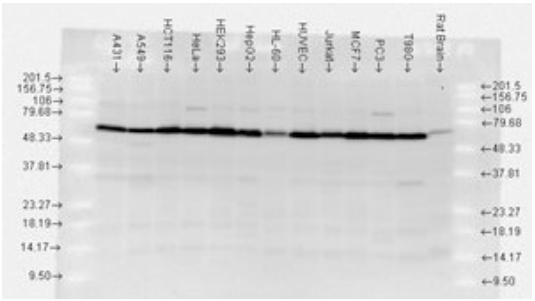
Graeme W. Carlile, Haouaria Balghi, Renaud Robert, Alberto Luini, John W. Hanrahan, David Y. Thomas. Ouabain Mimics Low Temperature Rescue of F508del-CFTR in Cystic Fibrosis Epithelial Cells. Front Pharmacol. 2012; 3: 176. Published online 2012 October 4. doi: 10.3389/fphar.2012.00176

Pictures:

Western blot analysis of Hsp70 in Pam212 cells using a 1:1000 dilution of the antibody



Western blot analysis of Hsp70 in multiple human and rat brain cell lysates using a 1:1000 dilution of the antibody



Hap70 visualized using the antibody