

mtHSP70 Monoclonal Antibody (JG1)

Catalog NumberMA3-028

Product data sheet

Details		Species Reactivity	
Size	100 µL	Species reactivity	Dog, Human, Mouse, Non-human primate
Host/Isotope	Mouse / IgG3	Published species	Dog, Rat, Non-human primate, Hamster, Mouse, Human, Not Applicable, Guinea pig
Class	Monoclonal		
Type	Antibody		
Clone	JG1		
Immunogen	Synthetic peptide corresponding to residues G(615) S G S S G T G E Q K E D Q K E E K Q(633) of mouse mtHSP70.		
Conjugate	Unconjugated		
Form	Liquid		
Concentration	1.07 mg/mL		
Purification	Protein A		
Storage buffer	PBS with 1mg/mL BSA		
Contains	0.05% sodium azide		
Storage Conditions	-20° C, Avoid Freeze/Thaw Cycles		
		Tested Applications	
		Immunohistochemistry (Paraffin) (IHC (P))	1 µg/mL
		Immunoprecipitation (IP)	Assay-dependent
		Western Blot (WB)	1:500
		Immunocytochemistry (ICC/IF)	1:50
		Published Applications	
		Western Blot (WB)	See 70 publications below
		Miscellaneous PubMed (Misc)	See 5 publications below
		Immunocytochemistry (ICC/IF)	See 24 publications below
		Immunoprecipitation (IP)	See 1 publications below

* Suggested working dilutions are given as a guide only. It is recommended that the user titrate the product for use in their own experiment using appropriate negative and positive controls.

Product specific information

MA3-028 detects mitochondrial heat shock protein 70 kDa (mtHSP70) from human, non-human primate, canine and mouse tissues. MA3-028 has been successfully used in Western blot, immunocytochemical, immunofluorescence, immunohistochemical (paraffin), and immunoprecipitation procedures. By Western blot, this antibody detects a single ~75 kDa band representing mtHSP70 from U2OS cell homogenate. Immunocytochemical staining of mtHSP70 in DAP.3 cells with MA3-028 results in a worm-like staining pattern, consistent with mitochondrial localization. Antibodies to this protein (and modification) were previously sold as part of a Thermo Scientific Cellomics High Content Screening Kit. This replacement antibody is now recommended for researchers who need an antibody for high content cell based assays. It has been thoroughly tested and validated for cellular immunofluorescence (IF) applications. Further optimization including the selection of the most appropriate fluorescent Dylight conjugated secondary antibody may have to be performed for your high content assay.

Background/Target Information

The HSP70 family is a set of highly conserved proteins that are induced by a variety of biological stresses, including heat stress, in every organism in which the proteins have been examined. The human HSP70 family members include: HSP70, a 70 kDa protein which is strongly inducible in all organisms but which is also constitutively expressed in primate cells; HSP72, a 72 kDa protein which is induced exclusively under stress conditions; HSC70, or cognate protein, is a 72 kDa constitutively expressed protein which is involved in uncoating clathrin-coated vesicles; GRP78, or BiP, is a glucose-regulated 78 kDa protein localized to the endoplasmic reticulum; and mitochondrial HSP70 (mtHSP70, GRP75 or mortalin) a 75 kDa protein that is found within the mitochondria. mtHSP70 is a mitochondrial resident protein that is involved in protein translocation into the mitochondria. Preproteins cross the mitochondrial membranes in an extended conformation. This requires unfolding of preproteins before entering translocation pores in the mitochondrial outer membrane. Preprotein unfolding is thought to be mediated by mtHSP70 and other inner membrane proteins of the mitochondria.

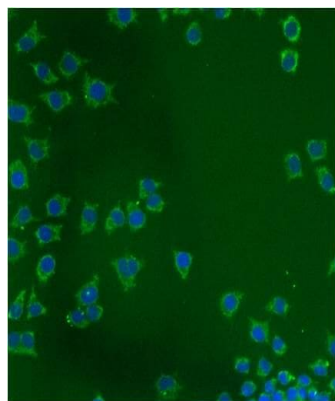
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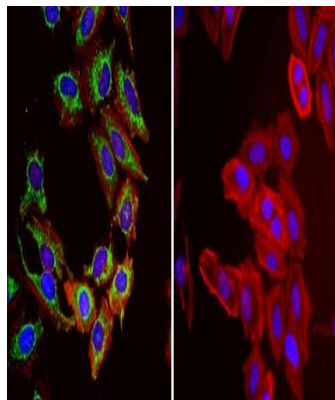
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Product Images For mtHSP70 Monoclonal Antibody (JG1)



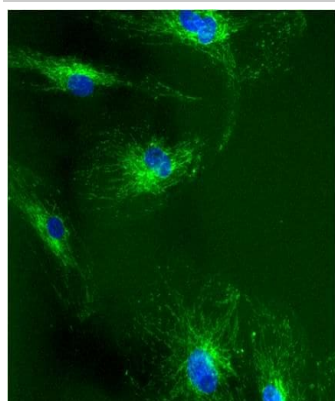
mtHSP70 Antibody (MA3-028) in ICC/IF

Immunofluorescent analysis of Heat Shock Protein 70 using anti-Heat Shock Protein 70 monoclonal antibody (Product # MA3-028) shows staining in NS-1 Cells.



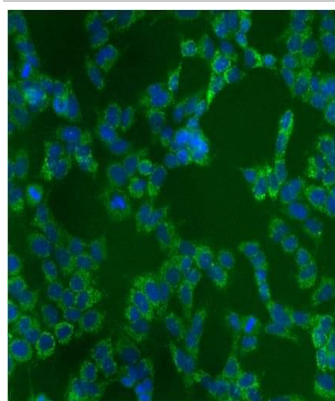
mtHSP70 Antibody (MA3-028) in ICC/IF

Immunofluorescent analysis of Heat Shock Protein 70 (Hsp70, green) in HeLa cells. Formalin fixed cells were permeabilized with 0.1% Triton X-100 in TBS for 10 minutes at room temperature and blocked with 1% Blocker BSA (Product # 37525) for 15 minutes at room temperature. Cells were probed with (left panel) or without (right panel) a Hsp70 monoclonal antibody (Product # MA3-028), at a dilution of 1:50 for at least 1 hour at room temperature, washed with PBS, and incubated with DyLight 488 goat-anti-mouse IgG secondary antibody (Product # 35502) at a dilution of 1:400 for 30 minutes at room temperature. F-Actin (red) was stained with Dylight 554 phalloidin (Product # 21834), and nuclei (blue) were stained with Hoechst 33342 dye (Product # 62249). Images were taken on a Thermo Scientific ArrayScan or ToxInsight at 20X magnification.



mtHSP70 Antibody (MA3-028) in ICC/IF

Immunofluorescent analysis of Heat Shock Protein 70 using anti-Heat Shock Protein 70 monoclonal antibody (Product # MA3-028) shows staining in HMVEC Cells.



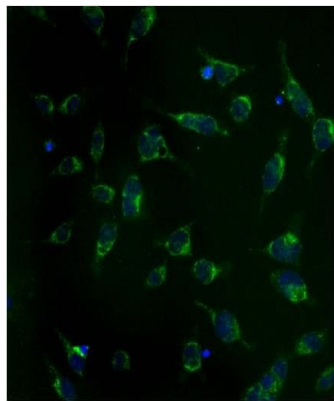
mtHSP70 Antibody (MA3-028) in ICC/IF

Immunofluorescent analysis of Heat Shock Protein 70 using anti-Heat Shock Protein 70 monoclonal antibody (Product # MA3-028) shows staining in A549 Cells.

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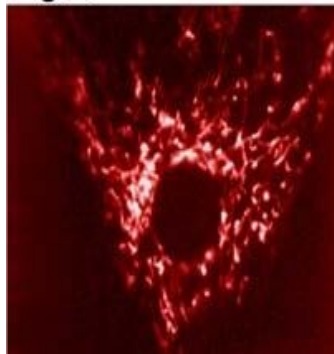
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mtHSP70 Antibody (MA3-028) in ICC/IF

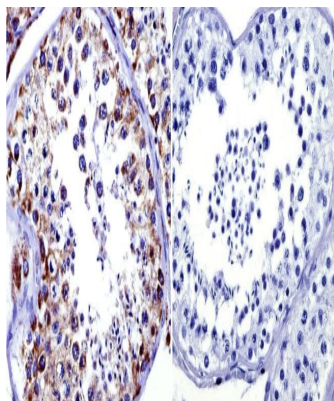
Immunofluorescent analysis of Heat Shock Protein 70 using anti-Heat Shock Protein 70 monoclonal antibody (Product # MA3-028) shows staining in p19 Cells.

Fig. 1



mtHSP70 Antibody (MA3-028) in ICC/IF

Immunolocalization of mtHSP70 in human fibroblasts using Product # MA3-028.



mtHSP70 Antibody (MA3-028) in IHC (P)

Immunohistochemistry was performed on normal biopsies of deparaffinized human 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 1:100 with a Mouse Monoclonal Antibody recognizing Mitochondrial Heat Shock Protein 70 (Product # MA3-028) 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.

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PubMed References For mtHSP70 Monoclonal Antibody (JG1)

70 Western Blot References

Species / Dilution	Summary
Human / Not Cited	<p>MA3-028 was used in Western Blotting to propose that human OXPHOS complexes are synthesized proportionally to each other, with mitonuclear balance relying on the regulation of OXPHOS subunit translation across cellular compartments, which may represent a proteostasis vulnerability.</p> <p>Genome biology (2022; 23:) "Balanced mitochondrial and cytosolic translatomes underlie the biogenesis of human respiratory complexes." Author(s):Soto I,Couvillion M,Hansen KG,McShane E,Moran JC,Barrientos A,Churchman LS PubMed Article URL:http://dx.doi.org/10.1186/s13059-022-02732-9</p>
Human / Not Cited	<p>MA3-028 was used in western blot to investigate the effect of PKC on MnSOD expression in human cells</p> <p>The Journal of biological chemistry (2011; 286: 29681) "Dual function of protein kinase C (PKC) in 12-O-tetradecanoylphorbol-13-acetate (TPA)-induced manganese superoxide dismutase (MnSOD) expression: activation of CREB and FOXO3a by PKC-alpha phosphorylation and by PKC-mediated inactivation of Akt, respectively." Author(s):Chung YW,Kim HK,Kim IY,Yim MB,Chock PB PubMed Article URL:http://dx.doi.org/10.1074/jbc.M111.264945</p>
Mouse / Not Cited	<p>MA3-028 was used in western blot to study the mitochondrial alterations during adipocyte differentiation</p> <p>Molecular and cellular biology (2003; 23: 1085) "Mitochondrial biogenesis and remodeling during adipogenesis and in response to the insulin sensitizer rosiglitazone." Author(s):Wilson-Fritch L,Burkart A,Bell G,Mendelson K,Leszyk J,Nicoloro S,Czech M,Corvera S PubMed Article URL:http://dx.doi.org/10.1128/MCB.23.3.1085-1094.2003</p>
Human / Not Cited	<p>MA3-028 was used in western blot to investigate the role of late activation of apoptotic pathway in mediating the cytotoxic effects of discodermolide and epothilone B in non-small cell lung cancer cells.</p> <p>Cancer research (2002; 62: 4081) "Late activation of apoptotic pathways plays a negligible role in mediating the cytotoxic effects of discodermolide and epothilone B in non-small cell lung cancer cells." Author(s):Bröker LE,Huisman C,Ferreira CG,Rodriguez JA,Kruyt FA,Giaccone G PubMed Article URL:http://www.ncbi.nlm.nih.gov/pubmed/12124345</p>
Human / Not Cited	<p>MA3-028 was used in western blot to assess the effect of matrine on STAT3 signaling in cholangiocarcinoma cells</p> <p>Pharmacological reports : PR (2015; 67: 388) "Matrine suppresses proliferation and induces apoptosis in human cholangiocarcinoma cells through suppression of JAK2/STAT3 signaling." Author(s):Yang N,Han F,Cui H,Huang J,Wang T,Zhou Y,Zhou J PubMed Article URL:http://dx.doi.org/10.1016/j.pharep.2014.10.016</p>
Human / Not Cited	<p>MA3028 was used in western blot to determine that HSPA9 knockdown is associated with increased TP53 expression and activity</p> <p>PloS one (2017; 12:) "Knockdown of HSPA9 induces TP53-dependent apoptosis in human hematopoietic progenitor cells." Author(s):Liu T,Krysiak K,Shirai CL,Kim S,Shao J,Ndonwi M,Walter MJ PubMed Article URL:http://dx.doi.org/10.1371/journal.pone.0170470</p>
Human / 1:300	<p>MA3-028 was used in western blot to describe the localization of BARD1 and study its interaction with p53</p> <p>Cellular signalling (2015; 27: 1763) "The BARD1 BRCT domain contributes to p53 binding, cytoplasmic and mitochondrial localization, and apoptotic function." Author(s):Tembe V,Martino-Echarri E,Marzec KA,Mok MT,Brodie KM,Mills K,Lei Y,DeFazio A,Rizos H,Kettle E,Boadle R,Henderson BR PubMed Article URL:http://dx.doi.org/10.1016/j.cellsig.2015.05.011</p>
Not Applicable / 1:1000	<p>MA3-028 was used in western blot to elucidate how inhibition of vascular smooth muscle cell dedifferentiation through mitochondrial dynamics regulation occurs by glucagon-like peptide 1</p> <p>Biochemical pharmacology (2016; 104: 52) "Glucagon-like peptide-1 inhibits vascular smooth muscle cell dedifferentiation through mitochondrial dynamics regulation." Author(s):Torres G,Morales PE,García-Miguel M,Norambuena-Soto I,Cartes-Saavedra B,Vidal-Peña G,Moncada-Ruff D, Sanhueza-Olivares F,San Martín A,Chiong M PubMed Article URL:http://dx.doi.org/10.1016/j.bcp.2016.01.013</p>

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	MA3-028 was used in western blot to investigate the role of a NH2 tau fragment in neuronal mitochondria
Human / Not Cited	<p>Journal of Alzheimer's disease : JAD (2010; 21: 445) "A NH2 tau fragment targets neuronal mitochondria at AD synapses: possible implications for neurodegeneration." Author(s):Amadoro G,Corsetti V,Stringaro A,Colone M,D'Aguanno S,Meli G,Ciotti M,Sancesario G,Cattaneo A,Bussani R, Mercanti D,Calissano P PubMed Article URL:http://dx.doi.org/10.3233/JAD-2010-100120</p>
	MA3-028 was used in western blot to investigate the function of ERp29 in thyroid cells.
Rat / Not Cited	<p>The Journal of biological chemistry (2002; 277: 17009) "Identification of ERp29, an endoplasmic reticulum luminal protein, as a new member of the thyroglobulin folding complex." Author(s):Sargsyan E,Baryshev M,Szekely L,Sharipo A,Mkrtchian S PubMed Article URL:http://dx.doi.org/10.1074/jbc.M200539200</p>
	MA3-028 was used in western blot to investigate the role of 53BP2 in the mitochondrial death pathway
Human / Not Cited	<p>Genes to cells : devoted to molecular & cellular mechanisms (2005; 10: 253) "53BP2 induces apoptosis through the mitochondrial death pathway." Author(s):Kobayashi S,Kajino S,Takahashi N,Kanazawa S,Imai K,Hibi Y,Ohara H,Itoh M,Okamoto T PubMed Article URL:http://dx.doi.org/10.1111/j.1365-2443.2005.00835.x</p>
	MA3-028 was used in western blot to study the role of viral and cellular oncogenes in the mitochondrial translocation of p53 in apoptosis
Human / Not Cited	<p>FEBS letters (2005; 579: 6079) "Viral and cellular oncogenes induce rapid mitochondrial translocation of p53 in primary epithelial and endothelial cells early in apoptosis." Author(s):Nemajerova A,Wolff S,Petrenko O,Moll UM PubMed Article URL:http://dx.doi.org/10.1016/j.febslet.2005.09.074</p>
	MA3-028 was used in Western Blotting to demonstrate that FUS is a bicistronic gene and suggests that both proteins, FUS and altFUS, cooperate in toxic mechanisms.
Human / 1:1000	<p>EMBO reports (2021; 22:) "The FUS gene is dual-coding with both proteins contributing to FUS-mediated toxicity." Author(s):Brunet MA,Jacques JF,Nassari S,Tyzack GE,McGoldrick P,Zinman L,Jean S,Robertson J,Patani R,Roucoux X PubMed Article URL:http://dx.doi.org/10.15252/embr.202050640</p>
	MA3-028 was used in Western Blotting to show that suppression of OSMR improves glioblastoma response to IR and prolongs lifespan.
Human / 1:1000	<p>Nature communications (2020; 11:) "OSMR controls glioma stem cell respiration and confers resistance of glioblastoma to ionizing radiation." Author(s):Sharnek A,Burban A,Laaper M,Heckel E,Joyal JS,Soleimani VD,Jahani-Asl A PubMed Article URL:http://dx.doi.org/10.1038/s41467-020-17885-z</p>
	MA3028 was used in immunohistochemistry and western blot to test if mitochondrial calcium uniporter concentrated at the mitochondria-sarcoplasmic reticulum interface promotes calcium transfer
Rat / 1:500	<p>The Journal of biological chemistry (2016; 291: 23343) "Strategic Positioning and Biased Activity of the Mitochondrial Calcium Uniporter in Cardiac Muscle." Author(s):De La Fuente S,Fernandez-Sanz C,Vail C,Agra EJ,Holmstrom K,Sun J,Mishra J,Williams D,Finkel T,Murphy E, Joseph SK,Sheu SS,Csordás G PubMed Article URL:http://dx.doi.org/10.1074/jbc.M116.755496</p>
	MA3-028 was used in western blot to study the influence of gender on the effects of fluoxetine treatment on mitochondrial glucocorticoid receptor phosphorylation in different brain regions of stressed rats
Rat / Not Cited	<p>Psychoneuroendocrinology (2013; 38: 2914) "Brain region- and sex-specific modulation of mitochondrial glucocorticoid receptor phosphorylation in fluoxetine treated stressed rats: effects on energy metabolism." Author(s):Adzic M,Lukic I,Mitic M,Djordjevic J,Elakovi I,Djordjevic A,Krstic-Demonacos M,Mati G,Radojicic M PubMed Article URL:http://dx.doi.org/10.1016/j.psyneuen.2013.07.019</p>
	MA3-028 was used in western blot to investigate an autoantibody against Hsp70 in esophageal squamous cell carcinoma patients
Human / 1:500	<p>Cancer letters (2008; 263: 280) "Proteomics-based identification of autoantibody against heat shock protein 70 as a diagnostic marker in esophageal squamous cell carcinoma." Author(s):Fujita Y,Nakanishi T,Miyamoto Y,Hiramatsu M,Mabuchi H,Miyamoto A,Shimizu A,Takubo T,Tanigawa N PubMed Article URL:http://dx.doi.org/10.1016/j.canlet.2008.01.013</p>

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	<p>MA3-028 was used in western blot to characterize a new mitochondrial nicotinamide adenine dinucleotide-dependent deacetylase .</p>
Human / Not Cited	<p>The Journal of cell biology (2002; 158: 647) "The human silent information regulator (Sir)2 homologue hSIRT3 is a mitochondrial nicotinamide adenine dinucleotide-dependent deacetylase." Author(s):Schwer B,North BJ,Frye RA,Ott M,Verdin E PubMed Article URL:http://dx.doi.org/10.1083/jcb.200205057</p>
	<p>MA3-028 was used in western blot to demonstrate the role of Rho/ROCK activation in RNA translocation to pseudopodial protrusions in epithelial tumor cells.</p>
Dog / Not Cited	<p>The Journal of biological chemistry (2005; 280: 30564) "Tumor cell pseudopodial protrusions. Localized signaling domains coordinating cytoskeleton remodeling, cell adhesion, glycolysis, RNA translocation, and protein translation." Author(s):Jia Z,Barbier L,Stuart H,Amraei M,Pelech S,Dennis JW,Metalnikov P,O'Donnell P,Nabi IR PubMed Article URL:http://dx.doi.org/10.1074/jbc.M501754200</p>
	<p>MA3-028 was used in Western Blotting to suggest that short, but not long-term, -hydroxybutyrate supplementation increases exercise capacity, associated with modifications in mitochondrial morphology and function in mouse skeletal muscle.</p>
Mouse / 1:1000	<p>Nutrients (2020; 12:) "-Hydroxybutyrate Increases Exercise Capacity Associated with Changes in Mitochondrial Function in Skeletal Muscle." Author(s):Monsalves-Alvarez M,Morales PE,Castro-Sepulveda M,Sepulveda C,Rodriguez JM,Chiong M,Eisner V,Lavandero S,Troncoso R PubMed Article URL:http://dx.doi.org/10.3390/nu12071930</p>
	<p>MA3-028 was used in western blot to investigate the sequence of biochemical events that mediates the apoptosis induced by etoposide.</p>
Mouse / 1:500	<p>The Journal of biological chemistry (2002; 277: 16547) "The course of etoposide-induced apoptosis from damage to DNA and p53 activation to mitochondrial release of cytochrome c." Author(s):Karpinich NO,Tafari M,Rothman RJ,Russo MA,Farber JL PubMed Article URL:http://dx.doi.org/10.1074/jbc.M110629200</p>
	<p>MA3-028 was used in western blot to determine the strain- and sex-dependent glomerular extracellular matrix signatures.</p>
Mouse / Not Cited	<p>Journal of the American Society of Nephrology : JASN (2015; 26: 3021) "Genetic Background is a Key Determinant of Glomerular Extracellular Matrix Composition and Organization." Author(s):Randles MJ,Woolf AS,Huang JL,Byron A,Humphries JD,Price KL,Kolatsi-Joannou M,Collinson S,Denny T,Knight D,Mironov A,Starborg T,Korstanje R,Humphries MJ,Long DA,Lennon R PubMed Article URL:http://dx.doi.org/10.1681/ASN.2014040419</p>
	<p>MA3-028 was used in western blot to study the inhibition of the proapoptotic Bax conformational change by cellular prion protein in human neurons and breast carcinoma cells</p>
Human / Not Cited	<p>Cell death and differentiation (2005; 12: 783) "Cellular prion protein inhibits proapoptotic Bax conformational change in human neurons and in breast carcinoma MCF-7 cells." Author(s):Roucou X,Giannopoulos PN,Zhang Y,Jodoin J,Goodyer CG,LeBlanc A PubMed Article URL:http://dx.doi.org/10.1038/sj.cdd.4401629</p>
	<p>MA3-028 was used in western blot to investigate the influence of Abeta on protein transport from nucleus to mitochondria</p>
Rat / 1:5000	<p>Journal of neurochemistry (2007; 103: 1989) "Chronic exposure to sub-lethal beta-amyloid (Abeta) inhibits the import of nuclear-encoded proteins to mitochondria in differentiated PC12 cells." Author(s):Sirk D,Zhu Z,Wadia JS,Shulyakova N,Phan N,Fong J,Mills LR PubMed Article URL:http://dx.doi.org/10.1111/j.1471-4159.2007.04907.x</p>
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Non-human primate / 1:1000	<p>The Journal of biological chemistry (2007; 282: 34770) "The cyclophilin-like domain of Ran-binding protein-2 modulates selectively the activity of the ubiquitin-proteasome system and protein biogenesis." Author(s):Yi H,Friedman JL,Ferreira PA PubMed Article URL:http://dx.doi.org/10.1074/jbc.M706903200</p>

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	MA3-028 was used in western blot to study the role of helix 3 in the anti-Bax function of prion protein
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Human / Not Cited	<p>Cell death & disease (2020; 11:) "BioID-based proteomic analysis of the Bid interactome identifies novel proteins involved in cell-cycle-dependent apoptotic priming." Author(s):Pedley R,King LE,Mallikarjun V,Wang P,Swift J,Brennan K,Gilmore AP PubMed Article URL:http://dx.doi.org/10.1038/s41419-020-03091-8</p>
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Human / Not Cited	<p>FASEB journal : official publication of the Federation of American Societies for Experimental Biology (2019; 33: 9263)</p> <p>"Mitochondrial adaptation in human mesenchymal stem cells following ionizing radiation."</p> <p>Author(s):Patten DA,Ouellet M,Allan DS,Germain M,Baird SD,Harper ME,Richardson RB</p> <p>PubMed Article URL:http://dx.doi.org/10.1096/fj.201801483RR</p>

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Species / Dilution	Summary
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Human / Not Cited	Proceedings of the National Academy of Sciences of the United States of America (1999; 96: 8499) "TID1, a human homolog of the Drosophila tumor suppressor l(2)tid, encodes two mitochondrial modulators of apoptosis with opposing functions." Author(s):Syken J,De-Medina T,Münger K PubMed Article URL: http://dx.doi.org/10.1073/pnas.96.15.8499

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