

Anti-Phospho-HSF1 (S307) antibody



Description	Rabbit polyclonal to Phospho-HSF1 (S307).
Model	STJ91348
Host	Rabbit
Reactivity	Human
Applications	ELISA, IF, WB
Immunogen	Synthesized peptide derived from human HSF1 around the phosphorylation site of S307.
Immunogen Region	250-330 aa
Gene ID	3297
Gene Symbol	HSF1
Dilution range	WB 1:500-1:2000IF 1:200-1:1000ELISA 1:5000
Specificity	Phospho-HSF1 (S307) Polyclonal Antibody detects endogenous levels of HSF1 protein only when phosphorylated at S307.
Purification	The antibody was affinity-purified from rabbit antiserum by affinity-chromatography using epitope-specific immunogen.
Note	For Research Use Only (RUO).
Protein Name	Heat shock factor protein 1 HSF 1 Heat shock transcription factor 1 HSTF 1
Molecular Weight	55 kDa
Clonality	Polyclonal
Conjugation	Unconjugated

Isotype	IgG
Formulation	Liquid in PBS containing 50% glycerol, 0.5% BSA and 0.02% sodium azide.
Concentration	1 mg/ml
Storage Instruction	Store at -20°C, and avoid repeat freeze-thaw cycles.
Database Links	HGNC:5224 OMIM:140580
Alternative Names	Heat shock factor protein 1 HSF 1 Heat shock transcription factor 1 HSTF 1
Function	<p>Function as a stress-inducible and DNA-binding transcription factor that plays a central role in the transcriptional activation of the heat shock response (HSR), leading to the expression of a large class of molecular chaperones heat shock proteins (HSPs) that protect cells from cellular insults' damage . In unstressed cells, is present in a HSP90-containing multichaperone complex that maintains it in a non-DNA-binding inactivated monomeric form . Upon exposure to heat and other stress stimuli, undergoes homotrimerization and activates HSP gene transcription through binding to site-specific heat shock elements (HSEs) present in the promoter regions of HSP genes . Activation is reversible, and during the attenuation and recovery phase period of the HSR, returns to its unactivated form . Binds to inverted 5'-NGAAN-3' pentamer DNA sequences . Binds to chromatin at heat shock gene promoters . Plays also several other functions independently of its transcriptional activity. Involved in the repression of Ras-induced transcriptional activation of the c-fos gene in heat-stressed cells . Positively regulates pre-mRNA 3'-end processing and polyadenylation of HSP70 mRNA upon heat-stressed cells in a symplekin (SYMPK)-dependent manner . Plays a role in nuclear export of stress-induced HSP70 mRNA . Plays a role in the regulation of mitotic progression . Plays also a role as a negative regulator of non-homologous end joining (NHEJ) repair activity in a DNA damage-dependent manner . Involved in stress-induced cancer cell proliferation in a IER5-dependent manner . (Microbial infection) Plays a role in latent human immunodeficiency virus (HIV-1) transcriptional reactivation. Binds to the HIV-1 long terminal repeat promoter (LTR) to reactivate viral transcription by recruiting cellular transcriptional elongation factors, such as CDK9, CCNT1 and EP300.</p>
Sequence and Domain Family	<p>In unstressed cells, spontaneous homotrimerization is inhibited . Intramolecular interactions between the hydrophobic repeat HR-A/B and HR-C regions are necessary to maintain HSF1 in the inactive, monomeric conformation . Furthermore, intramolecular interactions between the regulatory domain and the nonadjacent transactivation domain prevents transcriptional activation, a process that is relieved upon heat shock . The regulatory domain is necessary for full repression of the transcriptional activation domain in unstressed cells through its phosphorylation on Ser-303 and Ser-307 . In heat stressed cells, HSF1 homotrimerization occurs through formation of a three-stranded coiled-coil structure generated by intermolecular interactions between HR-A/B regions allowing DNA-binding activity . The D domain is necessary for translocation to the nucleus, interaction with JNK1 and MAPK3 and efficient JNK1- and MAPK3-dependent phosphorylation . The regulatory domain confers heat shock inducibility on the transcriptional transactivation domain . The regulatory domain is necessary for transcriptional activation through its phosphorylation on Ser-230 upon heat shock . 9aaTAD is a transactivation motif present in a large number of yeast and animal transcription factors .</p>

Cellular Localization

Nucleus Cytoplasm Nucleus, nucleoplasm Cytoplasm, perinuclear region Cytoplasm, cytoskeleton, spindle pole Cytoplasm, cytoskeleton, microtubule organizing center, centrosome Chromosome, centromere, kinetochore. The monomeric form is cytoplasmic in unstressed cells . Predominantly nuclear protein in both unstressed and heat shocked cells . Translocates in the nucleus upon heat shock . Nucleocytoplasmic shuttling protein . Colocalizes with IER5 in the nucleus . Colocalizes with BAG3 to the nucleus upon heat stress . Localizes in subnuclear granules called nuclear stress bodies (nSBs) upon heat shock . Colocalizes with SYMPK and SUMO1 in nSBs upon heat shock . Colocalizes with PRKACA/PKA in the nucleus and nSBs upon heat shock . Relocalizes from the nucleus to the cytoplasm during the attenuation and recovery phase period of the heat shock response . Translocates in the cytoplasm in a YWHAE- and XPO1/CRM1-dependent manner . Together with histone H2AX, redistributed in discrete nuclear DNA damage-induced foci after ionizing radiation (IR) . Colocalizes with calcium-responsive transactivator SS18L1 at kinetochore region on the mitotic chromosomes . Colocalizes with gamma tubulin at centrosome . Localizes at spindle pole in metaphase . Colocalizes with PLK1 at spindle poles during prometaphase .

Post-translational Modifications

Phosphorylated . Phosphorylated in unstressed cells; this phosphorylation is constitutive and implicated in the repression of HSF1 transcriptional activity . Phosphorylated on Ser-121 by MAPKAPK2; this phosphorylation promotes interaction with HSP90 proteins and inhibits HSF1 homotrimerization, DNA-binding and transactivation activities . Phosphorylation on Ser-303 by GSK3B/GSK3-beta and on Ser-307 by MAPK3 within the regulatory domain is involved in the repression of HSF1 transcriptional activity and occurs in a RAF1-dependent manner . Phosphorylation on Ser-303 and Ser-307 increases HSF1 nuclear export in a YWHAE- and XPO1/CRM1-dependent manner . Phosphorylation on Ser-307 is a prerequisite for phosphorylation on Ser-303 . According to PubMed:9535852, Ser-303 is not phosphorylated in unstressed cells. Phosphorylated on Ser-419 by PLK1; phosphorylation promotes nuclear translocation upon heat shock . Hyperphosphorylated upon heat shock and during the attenuation and recovery phase period of the heat shock response . Phosphorylated on Thr-142; this phosphorylation increases HSF1 transactivation activity upon heat shock . Phosphorylation on Ser-230 by CAMK2A; this phosphorylation enhances HSF1 transactivation activity upon heat shock . Phosphorylation on Ser-326 by MAPK12; this phosphorylation enhances HSF1 nuclear translocation, homotrimerization and transactivation activities upon heat shock . Phosphorylated on Ser-320 by PRKACA/PKA; this phosphorylation promotes nuclear localization and transcriptional activity upon heat shock . Phosphorylated on Ser-363 by MAPK8; this phosphorylation occurs upon heat shock, induces HSF1 translocation into nuclear stress bodies and negatively regulates transactivation activity . Neither basal nor stress-inducible phosphorylation on Ser-230, Ser-292, Ser-303, Ser-307, Ser-314, Ser-319, Ser-320, Thr-323, Ser-326, Ser-338, Ser-344, Ser-363, Thr-367, Ser-368 and Thr-369 within the regulatory domain is involved in the regulation of HSF1 subcellular localization or DNA-binding activity; however, it negatively regulates HSF1 transactivation activity . Phosphorylated on Ser-216 by PLK1 in the early mitotic period; this phosphorylation regulates HSF1 localization to the spindle pole, the recruitment of the SCF(BTRC) ubiquitin ligase complex inducing HSF1 degradation, and hence mitotic progression . Dephosphorylated on Ser-121, Ser-307, Ser-314, Thr-323 and Thr-367 by phosphatase PPP2CA in an IER5-

dependent manner, leading to HSF1-mediated transactivation activity .
Sumoylated with SUMO1 and SUMO2 upon heat shock in a ERK2-dependent manner . Sumoylated by SUMO1 on Lys-298; sumoylation occurs upon heat shock and promotes its localization to nuclear stress bodies and DNA-binding activity . Phosphorylation on Ser-303 and Ser-307 is probably a prerequisite for sumoylation . Acetylated on Lys-118; this acetylation is decreased in a IER5-dependent manner . Acetylated on Lys-118, Lys-208 and Lys-298; these acetylations occur in a EP300-dependent manner . Acetylated on Lys-80; this acetylation inhibits DNA-binding activity upon heat shock . Deacetylated on Lys-80 by SIRT1; this deacetylation increases DNA-binding activity . Ubiquitinated by SCF(BTRC) and degraded following stimulus-dependent phosphorylation at Ser-216 by PLK1 in mitosis . Polyubiquitinated . Undergoes proteasomal degradation upon heat shock and during the attenuation and recovery phase period of the heat shock response .