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:5224OMIM:140580
Alternative Names	Heat shock factor protein 1 HSF 1 Heat shock transcription factor 1 HSTF 1
Function	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.
Sequence and Domain Family	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 .

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 .