Revision 3

Store at -20C

#4356

# HSF1 Antibody

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**For Research Use Only. Not for Use in Diagnostic Procedures.**

| Applications: | Reactivity: | Sensitivity: | MW (kDa): | Source/Isotype: | UniProt ID: | Entrez-Gene Id: |
|---|---|---|---|---|---|---|
| W, IP, IHC-P, IF-IC, FC-FP, ChIP | H M R Mk | Endogenous | 82 | Rabbit | #Q00613 | 3297 |

## Product Usage Information

For optimal ChIP results, use 10 µl of antibody and 10 µg of chromatin (approximately 4 x $10^6$ cells) per IP. This antibody has been validated using SimpleChIP® Enzymatic Chromatin IP Kits.

| Application | Dilution |
|---|---|
| Western Blotting | 1:1000 |
| Immunoprecipitation | 1:50 |
| Immunohistochemistry (Paraffin) | 1:250 |
| Immunofluorescence (Immunocytochemistry) | 1:500 |
| Flow Cytometry (Fixed/Permeabilized) | 1:50 |
| Chromatin IP | 1:50 |

## Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA and 50% glycerol. Store at –20°C. Do not aliquot the antibody.

## Specificity/Sensitivity

This antibody detects endogenous levels of total HSF1 protein. The antibody does not cross-react with other HSF proteins.

## Source / Purification

Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to amino acids at the carboxy-terminus of mouse HSF1 protein. Antibodies are purified by protein A and peptide affinity chromatography.

## Background

All organisms respond to increased temperatures and other environmental stresses by rapidly inducing the expression of highly conserved heat shock proteins (HSPs) that serve as molecular chaperones to refold denatured proteins and promote the degradation of damaged proteins. Heat shock gene transcription is regulated by a family of heat shock factors (HSFs), transcriptional activators that bind to heat shock response elements (HSEs) located upstream of all heat shock genes (1). HSEs are highly conserved among organisms and contain multiple adjacent and inverse iterations of the pentanucleotide motif 5'-nGAAn-3'. HSFs are less conserved and share only 40% sequence identity. Vertebrate cells contain four HSF proteins: HSF1, 2 and 4 are ubiquitous, while HSF3 has only been characterized in avian species. HSF1 induces heat shock gene transcription in response to heat, heavy metals, and oxidative agents, while HSF2 is involved in spermatogenesis and erythroid cell development. HSF3 and HSF4 show overlapping functions with HSF1 and HSF2. The inactive form of HSF1 exists as a monomer that localizes to both the cytoplasm and nucleus, but does not bind DNA (1,2). In response to stress, HSF1 becomes phosphorylated, forms homotrimers, binds DNA and activates heat shock gene transcription (1,2). HSF1 activity is positively regulated by phosphorylation of Ser419 by PLK1, which enhances nuclear translocation, and phosphorylation of Ser230 by CaMKII, which enhances transactivation (3,4). Alternatively, HSF1 activity is repressed by phosphorylation of serines at 303 and 307 by GSK3 and ERK1, respectively, which leads to binding of 14-3-3 protein and sequestration of HSF1 in the cytoplasm (5,6). In addition, during attenuation from the heat shock response, HSF1 is repressed by direct binding of Hsp70, HSP40/Hdj-1, and HSF binding protein 1 (HSBP1) (7).

## Background References

1. Morimoto, R.I. (1998) *Genes Dev* 12, 3788-96.
2. Mercier, P.A. et al. (1999) *J Cell Sci* 112 ( Pt 16), 2765-74.
3. Kim, S.A. et al. (2005) *J Biol Chem* 280, 12653-7.
4. Holmberg, C.I. et al. (2001) *EMBO J* 20, 3800-10.
5. Chu, B. et al. (1996) *J Biol Chem* 271, 30847-57.
6. Wang, X. et al. (2003) *Mol Cell Biol* 23, 6013-26.
7. Satyal, S.H. et al. (1998) *Genes Dev* 12, 1962-74.

## Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

## Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

## Applications Key

**W:** Western Blotting **IP:** Immunoprecipitation **IHC-P:** Immunohistochemistry (Paraffin) **IF-IC:** Immunofluorescence (Immunocytochemistry) **FC-FP:** Flow Cytometry (Fixed/Permeabilized) **ChIP:** Chromatin IP

## Cross-Reactivity Key

**H:** Human **M:** Mouse **R:** Rat **Mk:** Monkey

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