Phosphorylation of HSF1 at Ser230 induces transactivation

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

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Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

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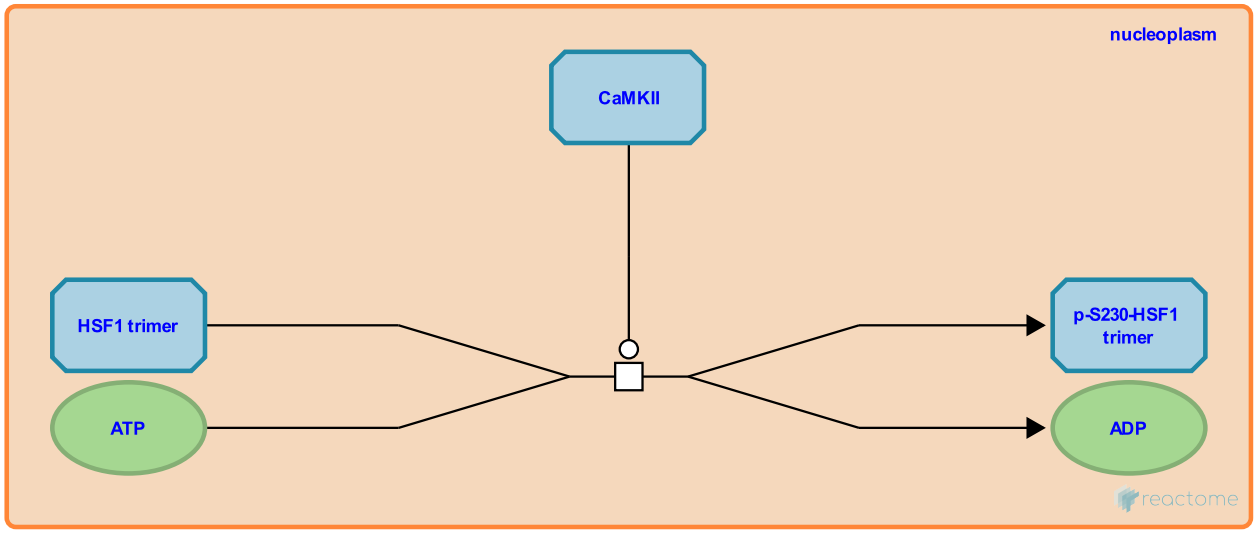
Stable identifier: R-HSA-5082387

Type: transition

Compartments: nucleoplasm



The transcriptional activity of HSF1 has been shown to be controlled by the regulatory domain composed of amino acids 221-310 (Green M et al. 1995; Zuo J et al. 1995; Newton EM et al., 1996). Ser230 is located in this regulatory domain of HSF1 and is constitutively and stress-inducibly phosphorylated (Holmberg CI et al. 2001). Analyses with phosphopeptide-specific antibody and site-directed mutagenesis revealed that phosphorylation at Ser230 enhanced the inducible HSF1 transcriptional activity in heat-shocked human K562 erythroleukemia and HeLa cells (Holmberg CI et al 2001). Active calcium/calmodulin-dependent protein kinase II (CaMKII) was shown to phosphorylate HSF1 at Ser230 in vitro. Moreover, CaMKII enhanced heat-induced tranactivating capacity of HSF1 and the level of endogenous Ser230 phosphorylation in K562 cells transfected with active CaMKII together with a CAT reporter plasmid containing the proximal HSE of human hsp70 promoter. Thus, CaMKII signaling may be involved in the positive regulation of HSF1-mediated transactivation. However, the possibility that other protein kinases might also phosphorylate Ser230 in vivo should not be excluded (Holmberg CI et al 2001).

Literature references

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Editions

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