Yap1p, a member of the AP-1 family of transcription factors, activates the transcription of anti-oxidant genes in response to oxidative stress. Yap1p is involved in one of three mechanisms that regulate the 43619>transcriptional response to oxidative stress. The other two involve Hog1p and Skn7p. The preferred Yap1p binding site is TTACTAA. The genes regulated by Yap1p include anti-oxidant genes such as TRR1, TRX2, GSH1, and GLR1. Although many of the genes regulated by Yap1p are also regulated by Skn7p, Yap1p and Skn7p appear to respond to different oxidative stresses. Consistent with its primary role in responding to oxidative stress, a yap1 null mutant is sensitive to multiple oxidative stresses, including hydrogen peroxide and compounds that alter the redox status in the cell.The transcriptional activity of Yap1p is regulated by its cellular localization. The N-terminal region contains a nuclear localization signalwhile the C-terminal region contains a nuclear export signal. In the absence of oxidative stress, Yap1p is exported from the nucleus via Crm1p, an exportin. However, in the presence of hydrogen peroxide, Hyr1p, a protein similar to glutathione peroxidase, catalyzes the formation of an intramolecular disulfide bond in Yap1p. This conformational change allows Yap1p to accumulate in the nucleus. It has also been proposed that there are multiple mechanisms for activating Yap1p since exposure to diamide causes nuclear accumulation without the formation of this disulfide bond.Yap1p is negatively regulated by the thioredoxin system and calcium. The thioredoxin system, consisting of thioredoxin reductaseand thioredoxin 2, reduces the disulfide bond that is required for the nuclear accumulation of Yap1p. Dephosphorylation and degradation of Yap1p appear to be regulated by calcineurin.Yap1p was identified by its ability to activate transcription from the mammalian AP-1 recognition element found in the SV40 promoter. Functional orthologs of Yap1p have been identified in many eukaryotes, including S. pombe, C. glabrata, K. lactis, and A. thaliana. These proteins define a subset of the AP-1 family protein family because they share a cysteine rich domainthat contains conserved cysteine residues.S. cerevisiae Yap1p has also been used to study anti-oxidant properties of green tea extracts and epigallocatechin gallate. Although promoted as anti-oxidants, they appear to produce hydrogen peroxide under certain conditions and promote the nuclear localization of Yap1p.