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ATFC is a Novel Transcriptional Activator in the Unfolded Protein Response

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Cells respond to an accumulation of unfolded proteins in the endoplasmic reticulum (ER) by increasing transcription of genes encoding molecular chaperones and folding enzymes. The information is transmitted from the ER lumen to the nucleus by intracellular signaling pathway, called the unfolded protein response (UPR). In *Saccharomyces cerevisiae*, such induction is mediated by the cis-acting unfolded response element (UPRE) which has been thought to be recognized by Hac1p transcription factor. We cloned the ATFC (acronym of 'activating transcription factor of chaperone') gene from *Bombyx mori* showing similarity with bZIP (basic-leucine zipper) transcription factor, Hac1p. We confirmed that ATFC gene product directly binds to UPRE by electrophoretic mobility shift assay. The fact that ATFC gene product binds to UPRE suggested that ATFC is required for up-regulated expression of molecular chaperones (Erp72) and folding enzymes (PDI).

As the above results, we concluded that ATFC is a major component of the putative transcription factor responsible for the UPR leading to the induction of ER-localized stress proteins.