

ATF6 (ACTIVATING TRANSCRIPTION FACTOR 6) FROM GRASS CARP (*CTENOPHARYNGODON IDELLA*) MODULATES THE TRANSCRIPTION INITIATION OF GRP78 AND GRP94 IN CIK CELLS

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ABSTRACT

ATF transcription factors are stress protein containing alkaline area - leucine zipper and play an important role in the endoplasmic reticulum stress. ATF6 is a protective protein which regulates the adaptation of cells to ER stress by modulating the transcription of UPR (Unfolded Protein Response) target genes, including *GRP78* and *GRP94*. To understand the molecular mechanism of ATF6 modulates the transcription initiation of *CiGRP78* and *CiGRP94*, we cloned ATF6 ORF cDNA sequences (*CiATF6*) by homologous cloning techniques. *CiATF6* (KT279356) is 4176 bp in length, comprising 159 nucleotides of 5'-untranslated sequence, a 1947- nucleotide open reading frame and 2170 nucleotides of 3'-untranslated sequence. The largest open reading frame of *CiATF6* translate into 648 aa and contains a typical DNA binding domain—BRLZ domain. In vitro, the results showed that *CiATF6* bound to the promoters of *CiGRP78* and *CiGRP94* by means of its BRLZ. The expression trend of *CiATF6* was similar to *CiGRP78* and *CiGRP94* did under thermal stress. Afterwards, recombinant plasmids pGL-*CiGPRP78P* and pGL-*CiGPRP94P* were constructed and transiently co-transfected with pcDNA3.1-*CiATF6* respectively into *C. idella* kidney (CIK) cells. Dual-luciferase reporter assays demonstrated that *CiATF6* up-regulates the transcription activity of *CiGRP78* and *CiGRP94* genes in CIK cells.

KEYWORDS: *CiATF6*; Endoplasmic Reticulum stress; *CiGRP78*; *CiGRP94*; transcription control

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