

# Molecular Cloning and Characterization of Novel Heat-responsive Transcription Factor (HSFa6e gene) and its Effect on the Expression of Targets in Wheat (*Triticum Aestivum* L.) under Heat Stress

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**Abstract**—High temperature stress has adverse effect on the yield as evident from the reduction in the yield of agricultural important crops. Plant has inbuilt defense mechanism to cope up with various stress by manipulating the expression of stress associated genes (SAGs) which protect the plant from the damage caused by heat stress. Very limited information about HSFs is available in wheat. Here, we report cloning of putative heat-responsive transcription factor of ~1.1 kb (HSFa6e) from wheat cv. HD2985. The sequence was submitted in NCBI GenBank with accession no KU291394. In-silico characterization showed the presence of HSF\_DNA-bind domain in the sequence. BLASTn search showed maximum homology with HSFa6e (accession no. KF208548.1) reported from *Triticum aestivum* followed by HSFa2c (accession no. HM446025.1) reported from *Hordeum vulgare*. The cloned gene has open reading frame of 368 amino acids. Southern blot analysis showed the presence of single copy number of HSFa6e. Expression analysis of HSFa6e showed significant up-regulation in the thermotolerant cvs. under HS, as compared to thermosusceptible; result was further validated by northern blot analysis. Expression analysis of targets (HSP90, HSP70 and HSP17) of HSFa6e showed positive correlation with the expression of TF under HS. The information generated in the present investigation can be used to manipulate the expression of target SAG's- a novel approach for mitigating the problem of terminal heat in wheat.

**Keywords:** Wheat, Stress associated gene, Heat-responsive transcription factor, Heat stress, Heat shock proteins.