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EVOLUTIONARY CONSERVED STRESS-RESPONSIVE CCCH ZINC FINGER PROTEINS ARE INVOLVED IN GERMINATION PROCESSES IN *ARABIDOPSIS* AND DURUM WHEAT

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CCCH zinc finger domain consists of a sequence with three cysteines and one histidine residues with strictly defined spacing: C-X_{4-15}-C-X_{4-6}-C-X_3-H. First identified in proteins of Tristetraprolin family in mammals, involved in regulation of stability of cytokine mRNAs, this domain has been found in plant RNA-binding proteins involved in the control of important biological processes such as floral reproductive organ identity determination and calmodulin-mediated RNA processing.

A gene coding for a CCCH zinc finger protein, named 2H8, was isolated in durum wheat and characterised as responsive to cold and dehydration stresses (De Leonardis et al., 2007). Six additional cDNA sequences were identified in the wheat EST database following a similarity search. These genes were characterised by expression studies under cold and water stress conditions.

Overall, a family of more than sixty genes coding for CCCH proteins was recently described in Arabidopsis. A functional conservation between a sub-group of stress-related Arabidopsis CCCH genes and the seven highly homologous genes, identified in durum wheat as responsive to cold and drought stresses has been suggested.

To gain information of the role of this gene family in stress response, a functional analysis on the Arabidopsis genes via mutant analysis is underway. In particular, this study is focused on the characterization of a set of Arabidopsis lines generated by ihpRNA interference and amiRNA technologies resulting in the down-regulation of the CCCH zinc finger gene At4g29190 (the most homologous to the 2H8 gene of wheat).

A deep phenotypic evaluation of the germination process under abiotic stress conditions revealed that the mutant lines grow better than the wild type. These results suggest that the product of the At4g29190 gene operates as a negative regulator of germination in particular in presence of salt stress and low temperature. Experiments are in progress to test whether At4g29190 regulates the expression of the genes controlling the accumulation of GA and ABA genes whose activity is important in the germination process. A detailed expression analysis of the homologous wheat gene is also in progress to verify a possible involvement of this gene product in the germination of wheat seeds under stress conditions.