

CCCH ZINC FINGER PROTEINS: A FAMILY OF RNA BINDING PROTEINS INVOLVED IN RESPONSE TO ABIOTIC AND BIOTIC STRESSES

A.M. MASTRANGELO, A.M. DE LEONARDIS, D. MARONE, L. CATTIVELLI

Experimental Institute for Cereal Research section of Foggia, S.S. 16 km 675, 71100 Foggia, Italy -
mastrangelo@iscfoggia.it

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A gene coding for a CCCH zinc finger protein, 2H8, was isolated in durum wheat and characterised as responsive to cold and dehydration stresses. CCCH zinc finger domain consists of a sequence with three cysteines and one histidine residues with strictly defined spacing: CX(8)CX(5)CX(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 other RNA-binding proteins, also in plants, as HUA1, a regulator of stamen and carpel identities in Arabidopsis. In order to assess the extent and the involvement of the CCCH zinc finger family in abiotic stress response in plants, a search for proteins containing this domain was carried out in Arabidopsis genome database. This study allowed to identify 56 putative genes coding for CCCH zinc finger proteins. These sequences were organised in clusters on the basis of sequence similarity, and their expression in response to multiple environmental stimuli was analysed by means of microarray data available at Gevestigator site. Most of components of this family showed to be regulated, in terms of transcript accumulation, by abiotic or biotic stresses. In particular, the members of the cluster IV, comprising the Arabidopsis most similar gene to durum wheat 2H8, were all regulated by abiotic stresses, cold, osmotic and salt in particular, suggesting that they could have an effective role in abiotic stress tolerance. The search and characterisation of other stress related CCCH zinc finger proteins in durum wheat, by searching sequences homologous to the Arabidopsis genes belonging to cluster IV, is in progress. This approach will help the understanding of those mechanisms regulating gene expression in response to abiotic stresses, based on control of RNA splicing and half life.