

Plant Genomics

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Drought tolerance mediated by the rice ubiquitin ligase OsDt1

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Drought stress is a major limitation to crop production in the worldwide. We have identified ubiquitin ligase OsDt1 that can aid drought survival of rice. The OsDt1 gene is strongly induced by water deficit. While down-regulation increases drought sensitivity, overexpression of OsDt1 allows plants to confer strong tolerance to water stress. RNA-seq assays identified a total of 307 differentially expressed genes (DEGs) between the OsDt1 overexpression line OXDt1-70 and the empty-vector control line A36 under normal conditions. Among them, 24% (50 up-regulated and 24 down-regulated) DEGs have been reported previously to be associated with water stress or drought regulators. The OsDt1 protein localizes to both the plasma membrane and nucleus in rice cells. Protein blot analysis suggests that the ubiquitin ligase activity of OsDt1 might be active in the nuclear pools. Yeast two-hybrid analysis shows that OsDt1 interacts with a negative regulator of drought response. These results suggest that OsDt1 function as a key regulator of drought survival in rice.

Biography

Wen-Yuan Song has completed his PhD in 1995 from the Institute of Genetics, Chinese Academy of Sciences, China and Postdoctoral studies from the University of California-Davis, USA. He is currently an Associate Professor at the University of Florida, USA. His research mainly focuses on plant response to biotic and abiotic stresses.

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