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Transcriptome analysis identifies candidate genes in response to biotic and abiotic stresses in *Arabidopsis*

Synan F Abu Qamar, Arjun Sham, Salma Al-Ameri and Ahmed Al-Azzawi
United Arab Emirates University, UAE

Plant responses involve changes at the cellular, physiological and molecular levels to adapt with biotic and abiotic stresses. We investigated the effects of combinations of different environmental stresses on the transcriptome level of *Arabidopsis* genome using comparative microarrays. We showed a unique program of gene expression activated in response to each biotic and abiotic stress. In addition, about 25% cold-, 6% drought-, 12% oxidative stress-, 2.5% heat-, 19% salinity- and 41% osmotic stresses-induced genes were commonly up-regulated with *B. cinerea* treatment; and 33%, 7%, 5.5%, 7.6%, 19% and 48% of genes commonly down-regulated with *B. cinerea* treatment, respectively. We investigated the role of cyclopentenones in mediating responses to *B. cinerea* infection and abiotic stress through TGA transcription factors, independent of jasmonic acid. Changes in the transcript levels of genes encoding components of the cyclopentenone signaling pathway in response to biotic and abiotic stresses suggest that the oxylipin signal transduction pathway plays a role in plant defense. The overlapping of plant responses to abiotic and biotic stresses unravels the complexity of genes and networks, provides new programs for resistance to multiple environmental stresses. Future directions to further analyze the functions of commonly expressed genes in response to environmental stresses will increase our understanding of the plant stress response.

Biography

Synan F Abu Qamar completed his PhD from Purdue University, Department of Botany & Plant Pathology in 2007 and his Postdoctoral studies in the same University in the area of Molecular Genetics of Plant Immunity. In August 2008, he joined the Department of Biology at the United Arab Emirates University as an Assistant Professor. Currently, he is an Associate Professor. His current research interest is in the area of Plant Molecular Genetics/Plant Biotechnology. He is a co-author of number of publications in peer-reviewed international journals and serves as an Editorial Board Member in reputed journals.

sabuqamar@uaeu.ac.ae

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