May Alqurashi, J Proteomics Bioinform 2017, 10:5 (Suppl)
http://dx.doi.org/10.4172/0974-276X-C1-097

The proteomics of drought stress response in arabidopsis thaliana

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Abiotic stresses are considered the most harmful factor concerning the growth and development of plants worldwide. Given the sessile nature of plants and that such stresses are essentially unavoidable, enforce the evolution of specific adaptive responses to both short- and long-term stress, which prompt different cellular processes and target different machineries. The complexity of the plant response to environmental stress need to be considered at the systems level where global changes over different biological process can give a better understanding of such responses. Therefore, utilizing shotgun proteomic and mass spectrometry- based approaches will help shed the light on the proteomic response profile. Here the aim is to study drought or water-deficit proteomic response in *Arabidopsis thaliana* by treating cell suspension callus with 40% polyethylene glycol for 10 and 30 minutes. Results have shown 310 differentially expressed significant proteins with a strict ±2.0-fold change. Over-representation was observed in the ribosome and its related functions as well as oxidative phosphorylation, which have a major indication of the importance of a drought response to the cell regardless of the duration of the treatment. Endocytosis, a form of active transport to recycle cell membrane proteins, showed highly enriched among the significant proteins, especially endosomal sorting complexes required for transport (ESCRT). The increased activity of ESCRT machinery proteins may have effects on numerous physiological and developmental processes. Studying the drought effect in such intensity after the short treatment duration gave a new understanding to the cellular response at the systems level and the importance of abiotic stress adaptation for survival.

Biography

May Alqurashi is interested in the proteomics of cellular response to abiotic stresses as well as signal transduction of second messengers. Her scientific passion commenced when she received her PhD from King Abdullah University for Science and Technology (KAUST). Her goal is to establish a greater understanding of plant proteomics and develop new technologies for desert agriculture.

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