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Systems biology in tropical plant research

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An accurate view of any biological event or process requires a comprehensive and quantitative understanding of the complex interactions in biological systems. This systems biology approach involves interdisciplinary research to develop the computational reconstruction of these systems which will be useful in predicting function and behavior in a system. Different types of large datasets such as transcriptomics, proteomics and metabolomics have been integrated through advanced computer science and computational analyses to enable rapid and accurate quantification of the components of the experimental system in a single experiment. Systems biology in plant research has gained considerable attention over the past decade even though not as extensive as for human and animal studies. Nevertheless, most of the systems biology research in plant has been mainly focused on the model plant, *Arabidopsis thaliana*, due to the vast information already obtained regarding this plant. Many crops and plants including those found in the tropics have been studied using the systems biology approach, at least at the level of identification of components through generation of more than one types of large omic datasets. Some examples of these advanced plant systems biology research as well as the basic studies on component identification of tropical plants will be reviewed in this paper. The ultimate aim of this paper is to encourage the botanical research community to utilize this approach in their respective research field which might provide a holistic answer to their specific scientific questions.

Biography

Roohaida Othman received her PhD in Biochemistry from University of Southampton, and joined Universiti Kebangsaan Malaysia as a Lecturer in 1995. Her research interest is focused on understanding the molecular mechanisms underlying the biosynthesis of commercially important metabolites in plants and algae. Her research group has employed tools of molecular biology, biochemistry and physiology as well as genomics and transgenics technology platforms to study the enzymes involved in these pathways. They have also developed protocols for higher plant and algae RNA extraction methods and overexpression of recombinant proteins in bacterial systems. She has been Editor-in-Chief for the *Journal of Tropical Plant Physiology* since 2010 and has been reviewer for several journals including *International Journal of Food Properties*.

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