
Plant response to biotic stress: Insights from transcriptomics and structural genomics

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Abstract:

The comprehension of the plant response to pathogen attack is essential for the development of strategies to improve resistance and diminish yield losses. Besides the desired resistance, the crosstalk between plant reaction to biotic and abiotic stresses is also a central question, especially considering the predicted global warming scenario. In this regard, the use of strategies involving omics analysis and bioinformatics can bring interesting evidence, useful for molecular breeding, crop selection and generation of genetically modified plants. Our group has been studying key gene families associated to plant defense in different plant groups including crops (e.g., cowpea, soybean, castor bean, grape, etc.) and medicinal plants with a focus on the families Euphorbiaceae, Fabaceae and Cucurbitaceae, using transcriptomics (RNA-Seq, RT-qPCR, transgenesis) and bioinformatics approaches. Gene families studied include R (Resistance), PR (Pathogen Related), TF (Transcription Factors) and Kinases, evaluated under biotic (pathogen inoculation) and abiotic (water deficit and salinity) stresses. Besides the expression profiling, aspects of gene and protein structure and genomic evolution have been analyzed. In case of resistant or tolerant plants (depending on the stress type), a constitutive or earlier induction of given genes has been recognized, indicating that the early stress perception and the precocious induction of other stress associated genes is a key defense mechanism. Particularly for some TF, PR and Kinase genes, a dual role in response to biotic and abiotic stresses has also been recognized.

Biography :

Ana Maria Benko-Iseppon is a Biologist with PhD in Plant Genetics from University of Vienna, Austria and Post doctorate in Plant Molecular Biology from the University of Frankfurt. She is working as full Professor in the Department of Genetics, Federal University of Pernambuco and as Head of the Laboratory of Plant Genetics Biotechnology. She has experience in the field of plant genetics with emphasis on plant molecular biology, genomics, transcriptomics and bioinformatics as well as in cytogenetics, genetic mapping in plants and bioprospection of therapeutic molecules from plants.