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Opinion Article

Advancement in Translational Plant Proteomics

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DESCRIPTION

Translational plant proteomics is the discipline of the proteomics field in biological sciences. In order to solve issues connected to the economic values of plants, food security, food safety and energy sustainability. The endurance and environmental adaption of plants are greatly influenced by the proteins that their genomes encode. The comprehensive research of proteomes is known as proteomics. Translational plant proteomics attempts to incorporate knowledge from basic sciences. Plant growth and development are constrained by abiotic and biotic stressors, which eventually create loss in the crop output. The ability to consider post-translational changes, which show the functional consequences of protein modifications on crop yield, is a distinct advantage of proteomics. In order to better understand the precise cellular responses that occur throughout plant development and biotic/abiotic stress responses, subcellular proteomics is used. An organism, system or biological environment creates a set of proteins known as a proteome. Thus definition of translational plant proteomics according to the various studies will be "applying the outcome of any discovery or technological development in plant proteomics to solve problems related to it, but which is not limited to the recreational and economic values of plants, food security and safety, energy sustainability, and human health" can be defined as translating plant proteomics". The proteome is dynamic; it varies from cell to cell and mutations occur over time. Protein microarrays or chips have been required for high and inexpensive expression analysis, but it is difficult to promote a protein microarray significantly to study the function of a whole genome. Mass Spectrometry (MS), along with several proteomics techniques, has evolved to more sensitively evaluate complicated protein mixtures. The research of proteins and their interactions within a cell is known as proteomics. Proteomics has emerged as a viable technique within the broad subject of functional OMICS, and the focus is moving away from genetics and toward the human body's protein composition. Proteins that are associated to stress and tolerance can be quickly identified and quantified thanks to proteomics, and in particular quantitative proteomics, which is developing as a potent field of study in the study of stress tolerance in plants. Studies emphasize the notable advancements in plant proteomics made over the previous last ten years that have opened the path for translational plant proteomics. Growing understanding of proteomics in plants has many more potential applications than just model and non-model plants, crop enhancement, and food analysis, safety, and nutrition. Given the abundance of data produced and, to some extent, used, there is a need for more effective and extensive avenues for the scientific community to receive information openly. The mechanism and dynamics of protein Post-Translational Modifications (PTMs) is one of the quickest and earliest reactions of plants to environmental changes and also this is a crucial topic of study in plant science proteomics. Protein phosphorylation is one of the PTMs that is most researched. Information transfer between model and non-model proteomes, for genome annotation, biodiversity screening, crop improvement against biotic and abiotic stresses, and food science and technology are just a few of the research fields that have benefited greatly from the rapid advancements in plant proteomics over the past years. Proteogenomics advancements have led to the current understanding of gene structure, organisation, and evolution in plant genomes very well.

CONCLUSION

Traditional plant breeding techniques have undergone changes as a result of technology breakthroughs. Tremendous progress has been made in this field in last few years. Knowledge gained through proteomics platforms for routine analysis and other applications relating to food quality, safety, and nutrition has been heavily incorporated into food science and technology. Advances in plant proteomics undoubtedly drive translational plant proteomics, but enrichment of plant proteomics is also possible. Translational plant proteomics will definitely advancing all credit goes to the technology and resources.

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