

Plant Omical Biotechnologies: Projecting Uphills

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Abstract

The objective of this viewpoint article was to critically discuss uses or misuses of plant omical biotechnologies. The world plant science and industry is in great need of pragmatic omical biotechnologies to minimize challenges. Omical biotechnologies must not be utilized to further complicate the current complexities with outward goals. Plant science mentors must persistently educate the next plant scientists on such a critical issue. This is only way to make science solution.

Key words: Omical science; Biotechnology; Plant

Background and Philosophy

Omical biotechnologies utilized in plant sciences include mainly genomics, proteomics and metabolomics. This relatively new branches of science have yielded different new viewpoints and insights into plant sciences. The omical biotechnologies may help deepen insights into lower plant cells and genes. Such profound knowledge can potentially help tackle physiology and health problems. In addition, omical biotechnologies have been considered as increasingly important tools to search for prevention and treatment strategies for a variety of health issues in human as well as plants and animals [1]. The modern plant physiology and breeding provides opportunities to more efficiently manage crop production and human nutrition using well-managed omical biotechnologies. This article critically discusses selected significant uses and misuses of omical biotechnologies in modern plant sciences.

Critical Discussion

Globally, plant omics biotechnologies may serve as operational tools to gain insight into major current health problems in human ecology such as obesity, metabolic syndrome, diabetes, cancer, and nervous abnormalities. These plant biotechnologies are very likely to be misutilized. In addition, they are highly probable to be misapplied and complicate the existing problems [1,2]. Since plant omical biotechnologies are in their neonatal developing phases, it is quite possible to misuse them or to detrimentally interpret their research outputs. A notable example is plant microarray biotechnologies that could generate great amounts of overly detailed data on a simple matter at cellular and gene-protein-metabolom levels. Such massive datasets are rather toxic to functional plant biology where complex problems mostly require very simple and feasible solutions. Misusing plant omical biotechnologies in such circumstances does indeed nothing but generating perplexing outputs that will accomplish little, if not nil, in overcoming challenges of the modern high-producing plant industry. Although, few softwares and techniques have been built to ease functional analysis of the massive outputs, real chances for pragmatic success are extremely restricted. They are in many cases just no better than vain. Generating new information is desirable but not increasingly helpful. What matters most is how to best utilize the data generated in enhancing the current understanding of plant functional biology that can be best accomplished through preventing and not fixing the problems. This implies that plant omical biotechnologies must be used to mechanistically analyse physiological bioprocesses in cells and tissues. This methodology aims to develop innovations in

preventive plant medicine and crop production. In other words, the problem is not the quality of data analysis but is rather related to how to globally and locally view the omical dataset towards simple systematic approaches. Noteworthy, the complex omical dataset do not essentially speak about causes or effects, which necessitates developing innovative new insights into these sciences.

Although, plant omical biotechnologies are usually informative, they are not as such educational and enlightening. The real challenge is that such details must be used to reveal significant mechanisms that possibly underlie the many issues of the modern plant industry. Moreover, it is not information per se that is most useful, but it is the vision into the information that matters critical in problem-solving. Edification is a final frontier in making sense out of plant omical sciences. The real science must be accurately distinguished from the pseudoscience [3-6].

The modern plant production is now far from nature where optimization comes from. Despite the increased yield, health and quality challenges have occurred. The advanced plant biotechnologies by themselves will in essence have limited capacities in preventing the problems. Nature must be viewed as a pattern for high-yielding plant production and as an art to grant human the power and motivation to move towards healthy and quality plant production systems [7-11].

Implications

Significant concerns were raised to constructively criticise some of the global views of plant omical biotechnologies. Despite their somehow informative nature, plant omical biotechnologies must not be carelessly misused or misinterpreted towards devastating complication of the existing problems. The goal must be development of problem prevention and not problem creation and solution. This goal may feasibly be accomplished through pragmatic visions into plant omical biotechnologies.

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