

Challenges in Plant Genomics

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Major challenges in present era of genomics research gears to engineer plants for the sustainable production of raw materials for food, nutrition, feed, fiber, medicines and fuel. An ideal green solution to the exponentially increasing demands in food, energy and other social accessory resides in plants as a source for environmentally, economically, and socially sustainable raw materials. At the same time, it is equally important to reduce pollution arising from intensive agriculture-related activities. United Nation's Food and Agriculture Organization (FAO) predicts 9 billion people on this planet till 2050. In the back drop of climate change and exponentially increasing population, creating plants resilient to unpredictable environmental conditions is more challenging than before [1]. Due to globalization of trade and economic prosperity in developing world, the consumer preference and demand for food are likely to change. Though significant development has been achieved from both public and private funded agricultural research projects, private funded research were mostly focused on staple food, fiber and to increase production efficiency, while public funding were more towards food safety, nutrition and environmental quality. Foreseeable future indicates an accelerated demand for more food, nutrition and fuel with growth in individual household income. Further, current food price is record high due to all time low in recent years stock of staple grains, thus unable to meet the demand and supply. Hence, the research priorities in plant biology must meet consumer demands in time to fulfill food, nutrition and energy security. Therefore, research in the area of plant science needs

more attention and investment from both public and private sector agencies to fund for developing next-generation agricultural materials for keeping a secure and sustainable future.

Rapid developments in next-generation genomics technologies offer enormous scope for genetic improvement of plants to meet 21st century needs. The specific challenges for plant genomics includes: (i) Advancing structural genomic research to next-level by making finished physical maps publicly available for most of the economically important plants using next generation sequencing technologies. (ii) Assigning function to genes and regulatory sequences by utilizing high-throughput functional genomics research under target environmental conditions. (iii) Development of crop specific high-resolution genetic maps tightly linked to agronomic traits of interest. (iv) Efficient tools, smart computational techniques and cyber infrastructure for high-throughput genotyping integrated to phenotyping under field conditions for the target trait.

This special issue is intended to contribute towards plant science research in the field of genome-scale analysis, functional genomics, proteomics and bioinformatics.

References

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