

A special issue on “Plant Molecular Biology”

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The use of molecular biology and genomics tools in plant biology research has greatly expanded our understanding of the molecular mechanisms that underlie plant development and physiology. The successful establishment of research resources such as mutant populations has led to progress in a variety of fields, including plant reproductive development, signal transduction, hormone functions, defense responses and epigenetic control. In the future these advances will potentially facilitate crop improvement through molecular breeding.

In conjunction with the successful “International Conference on the Frontiers of Plant Molecular Biology, Chinese Academy of Sciences (2005)” recently held in Shanghai (27-29th, Oct, 2005), *Cell Research* is pleased to publish a special issue on “Plant Molecular Biology”. The Special Issue includes 12 articles (4 invited reviews and 8 research articles) contributed by outstanding scientists in the field and covers recent progress in plant molecular biology, including areas such as gene regulation, development and signal transduction. Li and Ma provide a review of the molecular control of the generation and processing of double-stranded DNA breaks and their role in homologous recombination and meiosis. Zeng *et al.* discuss the roles of ubiquitination-mediated protein modification and degradation in plant-microbe interactions. In addition, recent progress in the study of the plant Rho GTPases and the brassinosteroid signal transduction pathway is analyzed by Brembu *et al.* and Wang *et al.*, respectively.

Two of the research articles included in the special issue relate to plant development. Ge *et al.* report a functional characterization of the *Arabidopsis* *BUD2* gene that encodes an S-adenosylmethionine decarboxylase that has a role in growth and development. Similarly Chen *et al.* describe the roles of *WPS1* (*Wrinkled Petals and Stamens 1*) in late development of petals and stamens in *Lotus japonicus*, a model plant for legumes.

A wide variety of topics and approaches are covered in the other research articles in the special issue. Wang *et al.* use a proteomic strategy to identify the potential target proteins regulated by an ASK1-mediated proteolysis pathway. Ma *et al.* show that the MORN (membrane occupation and recognition nexus) motifs in plant phosphatidylinositol phosphate kinases are involved in the regulation of differential subcellular localization and phospholipid binding. Ru *et al.* show that enhanced expression of the miR167 induced flower development and fertility defects. Jiang *et al.* analyzed the duplication and expression patterns of multicopy miRNA gene family members in both *Arabidopsis* and rice, setting the stage for further functional analysis of miRNAs in these model plants. Also on the epigenetic mechanism, Fong *et al.* present a study of the location of AtHD1 (*Arabidopsis thaliana* histone deacetylase 1) and a demonstration of its histone deacetylase activity *in vitro*. Guo *et al.* describe the development of rabbit monoclonal and polyclonal antibodies to detect the site-specific histone modifications, and the use of these antibodies to analyze the changes of overall level of specific histone modifications during development and evolution.

In short, these timely reviews and research articles provide readers with a succinct update on progresses in the field of plant molecular biology. We are grateful to the contributors for the excellent articles and would like to extend our thanks to other editors and reviewers for their assistance in making this special issue possible. We hope that this special issue of *Cell Research* serves as a window into the rapid advances in plant molecular biology both in China and abroad and that it will stimulate even greater collaboration and achievements in this area.

Guest Editors: Drs Hong Wei Xue, Hong Ma and Sheng Luan