Editor's note

The XXth International Congress on Sexual Plant Reproduction (SPR) was held from August 4 to 8, 2008, in Brasília, Brazil. Shortly afterward, “Frontiers in Sexual Plant Reproduction III” was held on October 17–19, 2008, in Tucson, Arizona. Both conferences demonstrated that the richly historic field of SPR remains dynamic and full of promise. There has been a significant acceleration in our understanding of the molecular processes behind plant reproductive processes in recent years. The investigations in this field are not only aided by modern molecular and cell biology technology but are also stimulated by current ideas from multiple viewpoints, especially evolutionary and epigenetic thought. Cross-talk among multiple disciplines has become a notable feature and has triggered rapid development in SPR research.

Another characteristic of developments in this field is that increasing amounts of current research are devoted to crop improvement and to solving practical problems in crop reproduction. Based on an enhanced understanding of the molecular mechanisms of SPR, male sterility, hybrid fertility, and hybrid vigor, these traditional themes have again become fashionable topics at a more comprehensive level. The recent effort to reveal the mechanisms regulating male sterility, hybrid fertility, and hybrid vigor has brought about significant breakthroughs, and these promising advances also mark the frontier in SPR.

To promote the study of SPR and draw the attention of more readers to this field, we have edited this special issue, which introduces current topics and notable advances in several key aspects of SPR. With this initiative, we hope to allow readers to scan attractive areas in SPR quickly and to gain rapid insight into what researchers examining the selected topics are thinking and doing. This special issue, thus, addresses in a coherent manner the diverse aspects of SPR and the multiplicity of its potential applications. To this end, both famous scholars and outstanding young scientists around the world were invited to contribute to this special issue. The selected topics include: Evolution of plant reproduction, Stamen specification and anther development, regulatory mechanism of pollen tube orientation, cytoplasmic male sterility and fertility restoration, posttranscriptional regulatory mechanism of male fertility, genomic imprinting before and after fertilization, involvement of parental-origin transcripts in heterosis and hybrid sterility and wide-compatibility.

Some of their work was reported at the recent SPR conferences. Readers may gain both theoretical and practical insights from their contributions. A number of references are given after each of these review papers, to help readers to understand the main points introduced by each author and to direct them to further reading. Although this issue does not outline all of the main advances in the field of SPR, and some of the ideas proposed by the authors still need corroborating evidence and further discussion, the fresh ideas and suggestions found here will surely stimulate deeper investigation of relevant critical events in SPR. This was our main purpose behind editing this special issue.

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