Weed Power, Translating Arabidopsis

Five years after providing the community with the first complete plant genome, Arabidopsis research is as vibrant and vigorous as ever. The global Arabidopsis research community, with its weed-like geographical distribution, tenacity, and invasiveness, continues to generate a wealth of new fundamental insights into all areas of biology. This continues a longstanding history in which Arabidopsis has led the way in so many of the subject areas covered in the pages of *Plant Physiology*. Moreover, being a very tractable experimental system at the vanguard of plant biology, Arabidopsis research has increasingly impacted our understanding of other, less facile plants and nonplant organisms.

In this year’s Arabidopsis special issue, we focus on the topic of Translational Plant Biology: the transfer of knowledge gained from the study of Arabidopsis to research in other plants. In addition to dozens of research articles, there are a variety of Perspectives and Updates that document the synergy that arises when using Arabidopsis to understand both smaller and larger organisms.

While this transfer of knowledge has been taking place for as long as there has been research on Arabidopsis, the era of genomics is accelerating the process and increasing the amount of reciprocity. This trend is partly because of the expanding contributions from structural genomics data: DNA sequence and high resolution genetic and physical maps naturally lend themselves to comparative biology approaches.

The increasing availability of functional genomics tools may also play a role in this trend. In the past, researchers were more focused on the idiosyncrasies of their favorite species; whether the size of its chromosomes, specifics of the breeding system, the types of metabolites it produced, or what hormones triggered the ripening of its fruit. Now that technologies for high throughput mRNA analysis, proteomics, ORFeome collections, and reverse genetics (e.g. sequence indexed insertion mutant collections or RNAi-based knockdowns) are within reach for a wider variety of plant species, researchers are increasingly likely to take advantage of whichever species are appropriate and convenient. This is blurring the lines between model organism and crop research, and as this trend continues, Arabidopsis will shift from model to reference organism—the plant in which the fundamentals are established and to which other plants are compared.

This special issue provides insightful coverage of ongoing examples of the role of Arabidopsis in translational research. Even more importantly, perhaps these articles will inspire more Arabidopsis biologists to bring their perspectives to less tractable plants, and encourage the rest of the plant community to take full advantage of the awesome power of the weed. We thank all the authors and editors for their contributions to the issue and the editorial staff for their hard work against tight deadlines.

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