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Permalink
https://escholarship.org/uc/item/47q4m9k9

Journal
Plant Cell, 27(10)

ISSN
1040-4651

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Publication Date
2015

DOI
10.1105/tpc.15.00862

Peer reviewed
The Plant Cell Introduces Breakthrough Reports: A New Forum for Cutting-Edge Plant Research

The Plant Cell is introducing a new category of research article, which we call Breakthrough Reports, to provide a home for exploratory articles on mechanistic and conceptual aspects of plant biology. Breakthrough Reports will showcase studies with conceptual novelty, whether in pointing the way to a deeper understanding of natural phenomena, opening new areas of research, bringing together disparate fields of study, identifying new biological processes, discovering new mechanisms and pathways, or overturning dogma.

In its first decade, The Plant Cell published research emphasizing classical genetic studies leading to the discovery of key components in fundamental metabolic, sensing, and signaling pathways in plants (e.g., Bowman et al., 1989, genes directing flower development; Feys et al., 1994, co1 mutants and methyl jasmonate perception; Lincoln et al., 1990, axr1 mutants and auxin signaling; Wei and Deng, 1992, cop9 and light-regulated development). With these components in hand, the door to a mechanistic understanding underlying biological function in plants was opened; the articles published in The Plant Cell in its second decade evolved to present “complete stories” with substantial molecular insight into individual pathways.

In the journal’s third decade, we are seeing within its pages the impact of technological developments, whether metabolic profiling, proteomics, next-generation sequencing, high-resolution microscopy, or high-throughput screening, presenting us with a whole organism or systems view of plant biology. Yet, still we do not know the specific function of the vast majority of genes in any genome.

To ensure that The Plant Cell remains a vital resource in the coming decades, we are committed to publishing the most significant advances and interesting articles that stimulate our thinking about how plants grow, reproduce, function, and interact with their environment and with other organisms. What types of articles should we be publishing? We certainly want to encourage articles in which “complete story” mechanistic research is integrated with physiological, developmental, and ecological concepts that illuminate how plants live in the real world. Nevertheless, we also want to publish work in which new concepts in plant biology are developed or where dogmas are challenged. This may include areas that have been underrepresented, such as functional analyses that use comparative studies, non-model organisms, or environments other than those typically found in a laboratory.

We ask you to think about some of the classic articles published in The Plant Cell that may not fit today’s mold of the complete story (e.g., Farmer and Ryan, 1992, lipid-based signaling in response to insect and pathogen attack; McQueen-Mason et al., 1992, discovery of expansins; Napoli et al., 1990, cosuppression in petunia—pioneering work leading to the discovery of RNA interference; Ward et al., 1991, a model for the induction of systemic acquired resistance). These articles opened up new avenues of investigation, and we welcome such advances today.

From the earliest years of the journal, a major criterion for acceptance has been “exciting science, irrespective of the subspecialty” (Goldberg, 1990). We couldn’t agree more, and our aim is for Breakthrough Reports to help ensure that The Plant Cell continues to publish the most exciting research in the plant sciences. We ask you—authors, reviewers, and readers—to evaluate these manuscripts for their excitement and potential for opening new areas of investigation without the expectation that every question will be answered. Scientific rigor will remain paramount, but research that pushes the conceptual bounds of a field often is developing models or ideas that are so new that mechanistic explanation may be extraordinarily difficult to obtain to any measure of completeness. Rather than force such studies to sit for years on the experimental bench to develop a complete molecular story, we propose to publish exciting shorter articles that may not yet provide a full answer but will stimulate more research, leading eventually to increased understanding and a more complete story. As for regular research articles, we will not impose strict limitations on length, but our aim is to publish shorter articles that include little to no supplemental data (see the Instructions for Authors for more details).

At its core, the introduction of Breakthrough Reports is The Plant Cell’s effort to push innovation, originality, new ways of looking at things, and, ultimately, a new and deeper understanding of mechanisms in plant biology. We want you, the author, reviewer, and reader, to tell us what the next quarter-century of plant research will be about. Go to tpc.msubmit.net to submit your latest breakthroughs.

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This information is current as of November 20, 2015