

Preface

Introduction to the 43rd Volume of the Recent Advances in Phytochemistry Series

This is the third volume since the reintroduction of the *Recent Advances in Phytochemistry* (*RAP*) series, an annual publication supported by the Phytochemical Society of North America. Topics appropriate for *RAP* include the biosynthesis of natural products and regulation of metabolism, the ecology of specialized metabolites and the evolution of their pathways, and the effects of natural products or plants on human health. Research appropriate for *RAP* involves genomics, proteomics, metabolomics, natural product structural determination and new technology development, medicinal chemistry and metabolic engineering, or any of the myriad of fields that are now closely associated with what may be called “traditional phytochemistry” and plant biochemistry. The advent of postgenomics-based ways of thinking, systems biology, synthetic biology, comparative genomics/proteomics/transcriptomics/metabolomics, and especially of the introduction and establishment of a mentality that leads to the support of large collaborative projects has opened up many new doors to scientists interested and versed in the (bio)chemistry of plants. The goal of *RAP* is to highlight these developments.

Two main types of articles are printed in *RAP*: Perspectives and Communications. Perspectives in *RAP* are expected to synthesize results from the primary literature and perhaps from new/novel results and place these in perspective relative to the broader field. These articles may be similar to review articles, but also are intended to present important ideas and hypotheses and may present proposals for interesting directions in the field. It is the hope of the Editorial Board that these articles will be of great value to a large audience. Communications are intended to present new advances in the field that will be of interest to a large audience. Articles of both types are typically solicited from the society membership based on the content of the annual meeting talks, but in keeping with the title “Recent Advances in Phytochemistry” the editorial board reserves the right to solicit additional Perspectives and/or Communications from non-attendees as well (e.g., where an editorial board member has knowledge of an interesting recent advancement that would be of general interest to the society membership).

All submissions to *RAP* go through a rigorous peer review process, overseen by the Editorial Board, which includes external review. *RAP* is indexed with Springer published journals. All *RAP* papers are available not only in the published volume form, but also electronically through Springer's online literature services. This marks a significant change from past volumes of *RAP* and it is the hope of the Editorial Board that this will lead to broader dissemination of the contents of and greater interest in *RAP*.

This 43rd volume of *RAP* includes a total of seven articles based on talks presented at the 50th Anniversary meeting of the PSNA, which was held at the Fairmont Orchid in Waikaloa, Hawai'i, USA. These seven Perspectives give a very good picture of the breadth of plant (bio)chemistry research in North America, which is also indicative of the state of the field worldwide. Each of these articles describes the integration of several different approaches to ask and then answer fascinating questions regarding the function of interesting plant metabolites, either in the plant itself or in interactions with the environment (natural setting or human health application).

Two perspectives outline very clearly the power of approaching biological questions from a modern "omics" or systems biology approach. Beale and Ward outline how metabolomics approaches can be brought to bear on plant biosynthetic questions and quickly lead to important advances in our understanding or how plants produce important metabolites. Zandkarimi et al. outline the integration of ion mobility spectrometry into mass spectrometry-based metabolomics investigations and show clearly how powerful those two spectrometric technologies can be when used together.

Plant biotechnology and its application to plant protection, pathogen/pest deterrence and drug production is discussed in three perspectives. Asano et al. describe the development of plant cell cultures and tissue culture techniques that lead to production of important indole alkaloid compound production, particularly of camptothecin production in cultures from *Ophiorrhiza* species. Mitchell Wise outlines how cereal crops can be protected from disease by application of plant defense activators, bioactive compounds that are typically derived from specific plants. Duke et al. provide an extensive review of the history and future prospects of prospecting within the plant kingdom for compounds that protect both crops and humans from insect pests.

The last two perspectives emphasize the role of plant-derived compounds in human health. Zhang et al. review the role of sulfhydryl-reactive compounds, such as the sulforaphanes from broccoli and related plants and several phenolics, including curcumin, in modulating two important pathways that are involved in protecting mammalian cells from oxidative and inflammation-induced damage, such as that which occurs in a number of degenerative diseases and cancer. Eggler and Savinov focus on phytochemicals that are involved in activating the Nrf2 pathway, and thereby help prevent disease.

As always, we hope that you will find these Perspectives to be interesting, informative, and timely. It is our goal that *RAP* will act not only as the voice of the

PSNA, but that it will serve as an authoritative, up-to-date resource that helps to set the gold standard for thought and research in fields related to plant biochemistry.

We welcome suggestions for future articles and comments on the new format.

The RAP Editorial Board

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