

## Preface to the 44th Volume of the Recent Advances in Phytochemistry Series

Welcome to the fourth volume since the reintroduction of the *Recent Advances in Phytochemistry (RAP)* series, an annual series championed by the Phytochemical Society of North America. *RAP* is dedicated to publishing both review and primary research articles for a broad audience of biologists, chemists, biochemists, pharmacologists, clinicians and nutrition experts, especially those interested in the biosynthesis, structure, function and/or bioactivity of plant natural products. Recurring themes include the evolution and ecology of specialized metabolites, the genetic and enzymatic mechanisms for plant products formation and metabolism, the systems biology study of cells, tissues, and organs, the engineering of plant natural products, as well as various aspects of their application for human health. Also, new developments in the techniques used to study plant natural products are presented and discussed, for example, those for structure elucidation and quantification, for “omic” (genomic/proteomic/transcriptomic/metabolomics) profiling or for microscopic localization. In short, this series combines chapters from experts that will explain and discuss selected topics, to highlight the most exciting new research in phytochemistry.

Two main types of articles are printed in *RAP*: Perspectives and Communications. The *RAP* Perspectives aim to give a general introduction to a field and an overview of the pertinent literature as a backdrop for new results from the primary literature. These articles may be similar to review articles, but often present important ideas and hypotheses, including 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. The *RAP* Communications focus more on primary data that showcases particular new advances in a specialized field that will be of interest to a large audience. Articles of both types are typically solicited from prominent members of the Phytochemical Society of North America and based on the content of the annual meeting talks. However, the Editorial Board also invites additional Perspectives and/or Communications from selected authors beyond the society’s meeting to give a rounded picture of all “Recent Advances in Phytochemistry”.

All submissions to *RAP* go through a rigorous, external peer review process, overseen by the Editorial Board. Since the reintroduction of the series, *RAP* is indexed together with all journals published by Springer. 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 older volumes of *RAP*, and it is the hope of the Editorial Board that this will lead to broader dissemination and greater interest in *RAP*.

This 44th volume of *RAP* includes a total of eight articles mostly based on talks presented at the 51st annual meeting of the Phytochemical Society of North America. As was seen in *RAP* volumes 41–43, these 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 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 focus on the biosynthesis of natural products: Dastmalchi and Dhaubhadel summarize new findings on the formation and regulation of isoflavonoids, using soybean seeds as a model system. In contrast, Cook et al. give an overview of natural product formation by microorganisms associated with plants, with particular emphasis on alkaloids from the locoweeds.

The next two chapters give updates on the bioactivity of selected plant natural products. Timoshenko et al. highlight progress on toxic lectins from various plant species such as mistletoes and elderberries. Guerrero-Analco et al., on the other hand, summarize work on plant natural products with activity against type 2 diabetes, taking an ethno-botanical approach combining Aboriginal knowledge with modern phytochemistry.

Two further Perspectives feature biotechnological approaches, both starting with genomic and biochemical results and exploring their applications in metabolic engineering. This modern branch of Phytochemistry is explored by Zerbe and Bohlmann in their chapter on terpenoid products from conifers and also by Lisko et al. in their review of vitamin C formation in various plant species.

Finally, two more Perspectives further highlight analytical aspects of plant natural products. Berhow et al. review the composition of camelina oil, a very promising commodity containing a wide variety of plant lipids, while Glover and Murch focus on the qualitative and quantitative analysis of a potentially toxic amino acid found in tropical food chains.

Overall, we are excited to present this broad set of review papers on various aspects of modern phytochemistry. We hope 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 Phytochemical Society of North America, but that it will serve as an authoritative, up-to-date resource that helps to set the gold standard for thought and research in plant natural products. Enjoy the read!

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