

# Analyzes the latest advances in mechanistic enzymology

## Volume 76

*Advances in Enzymology and Related Areas of Molecular Biology* is a seminal series in the field of biochemistry, offering researchers access to authoritative reviews of the latest discoveries in all areas of enzymology and molecular biology. These landmark volumes date back to 1941, providing an unrivaled view of the historical development of enzymology. The series offers researchers the latest understanding of enzymes, their mechanisms, reactions and evolution, roles in complex biological processes, and their applications in both the laboratory and industry.

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*Volume 76* focuses on the most recent advances in the field of practical preparative enzymology. Enzymes have long been recognized and utilized for the preparation of specialty chemicals, and enzymatic resolution and desymmetrization are mainstays of the fine chemical industry. Today, some of the most intriguing enzymatic synthetic approaches involve the construction of complex pathways within cells to prepare molecules much more complex than those that can be reasonably developed in cell-free applications; this volume considers some of those processes. Koffas and coworkers provide an overview of the construction of complex biosynthetic pathways for the preparation of a variety of both fine and commodity chemicals, including biofuels. The development of highly efficient pathways involves a combination of rational design and, increasingly, evolutionary approaches, and Schmidt-Dannert reviews the use of evolutionary strategies in synthetic biology. Glycosylation of myriad biologically active species impacts both in vivo activity and ADME behavior. The addition of carbohydrate moieties to complex organic molecules represents a daunting synthetic challenge, and Williams and Thorson review the various strategies for enzymatic glycosylation of complex natural products. Finally, Pimkin and Markham review the structure, activity, and mechanism of inosine monophosphate dehydrogenase, a central enzyme of purine biosynthesis.

With its wide range of topics and long historical pedigree, *Advances in Enzymology and Related Areas of Molecular Biology* can be used not only by students and researchers in molecular biology, biochemistry, and enzymology, but also by any scientist interested in the discovery of an enzyme, its properties, and its applications.

**ERIC J. TOONE, PhD**, is Professor of Chemistry and Professor of Biochemistry at Duke University. His research focuses on the structure, activity, utility, and evolution of the pyruvate aldolases, association in aqueous solution, and the chemistry and biology of nitric oxide.

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