

BOOK REVIEW

Bioorganic Photochemistry, Vol. 1, Photochemistry and the Nucleic Acids. Edited by HARRY MORRISON. Wiley-Interscience, New York, 1990. 437 pp.

To the best knowledge of the reviewer, "bioorganic photochemistry," used as the title of this book, is a new term. It emphasizes the importance of organic chemistry in the field of biophotochemistry. However, as hoped by the editor, the review articles in this monograph have proved useful to readers approaching the problem from a "bio," an "organic," or a "photochemical" perspective. The editor took up the photochemistry of nucleic acids as a topic among various photobiological problems such as photosynthesis, phytochrome-mediated events, and vision.

This book contains five chapters. Chapter 1 is a comprehensive review of 272 pages (about two-thirds of the book) on "The Photochemistry of Nucleic Acids" by J. Cadet and P. Vigny. The history of nucleic acid photochemistry is relatively short: the organic chemical research started in the 1960s. The review covers all of this period and is very useful as an overview of the photophysical and photochemical aspects of nucleic acids and related compounds and their photooxidation and photosensitized reactions. Chapter 2 (44 pages) is a review on "Photosensitized Reactions of DNA: Cleavage and Addition" by E. Kochevar and D. A. Dunn, focusing on the photosensitized cleavage of DNA by natural and artificial dyes, drugs, transition metal compounds, and porphyrins. Chapter 3 (24 pages) by I. Saito and H. Sugiyama describes "Photoreactions of Nucleic Acids and Their Constituents with Alcohols, SH Compounds, Amines, and Amino Acids," including DNA-protein photo-cross-linking. Chapter 4 by J. E. Hearst's group (38 pages) describes "Applications of Psoralens as Probes of Nucleic Acid Structure and Function," focusing on structural investigation of RNA. Chapter 5 (47 pages) by A. Favre deals with "4-Thiouridine as an Intrinsic Photoaffinity Probe of Nucleic Acid Structure and Interactions," emphasizing the role of 4-thiouridine in tRNA research. The book ends with an 11-page subject index which has a sufficient number of entries.

The readers will find that the photochemistry of nucleic acids is not only important in photobiological and photomedicine phenomena but also useful as a tool for nucleic acid research in particular structural problems. All chapters are well written, with a comprehensive literature survey. The book should be of value to chemists, biologists, and others involved with nucleic acid research and photochemistry.

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