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Edited by

HENRY J. VOGEL

NUCLEIC ACID-PROTEIN RECOGNITION

Edited by

HENRY J. VOGEL

College of Physicians and Surgeons

Columbia University

New York, New York



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Preface

A central aspect of molecular biology is the dynamic communication between genetic elements, as represented by nucleic acids, and the metabolic apparatus, as represented by enzymes and other proteins. This communication appears to depend, at least in part, on codelike rules governing nucleic acid-protein interactions. Detailed data on specific structural features of such interactions are emerging from a variety of sources and are beginning to provide an understanding of the "recognition" of nucleic acids by proteins and vice versa. These findings are yielding remarkable insights into molecular behavior occurring, in terms of the dimensions of recognition sites, near the lower end of the size spectrum of biological architecture.

The development of this area encouraged discussion of a cross section of systems showing defined recognition phenomena. The eligible partners for these interactions include, on the one hand, single- and double-stranded polydeoxyribonucleotides, polyribonucleotides, and oligonucleotides (and, by extension, di- and mononucleotides), among them, various types of DNA and ribosomal, messenger, transfer, and primer RNA's, and, on the other hand, nucleic acid polymerases and ligases, nucleases, nucleic acid-modifying enzymes, aminoacylation enzymes, and initiation and elongation factors, as well as structural, unwinding, and regulatory proteins.

A symposium on "Nucleic Acid-Protein Recognition" was held at Arden House, on the Harriman Campus of Columbia University, from May 30 through June 1, 1976. The proceedings of the symposium are contained in this volume.

The meeting inaugurated the "P & S Biomedical Sciences Symposia" under the sponsorship of the College of Physicians and Surgeons of Columbia University. The symposia are expected to take place annually and to result in a series of volumes. The topics are intended to rotate among the health-related biological disciplines.

This new forum would not have come into existence without the innovative spirit and continued support of Dr. Donald F. Tapley, Dean

of the Faculty of Medicine. This volume and the meeting on which it is based have been designated by Dr. Tapley to form part of the observance of the National Bicentennial by the College of Physicians and Surgeons.

We sincerely thank Dr. Alexander Rich for his delivery of the Opening Address and for a great deal of most valuable counsel. Dr. Peter H. von Hippel, Dr. Donald R. Helinski, Dr. David S. Hogness, Dr. Arthur Kornberg, and Dr. Dieter Söll likewise gave greatly appreciated advice, as did my colleagues at P & S, Dr. Jose M. Ferrer, Dr. Brian F. Hoffman, Dr. Councilman Morgan, and Dr. I. Bernard Weinstein. Special thanks go to Dr. Ruth H. Vogel for her constructive helpfulness in the organization of the symposium and in every phase of the publication of this volume.

The contributions of the session chairmen, Dr. von Hippel, Dr. Paul Doty, Dr. B. Müller-Hill, Dr. Charles A. Thomas, Jr., Dr. Rich, Dr. Joan A. Steitz, Dr. Masayasu Nomura, and Dr. Sol Spiegelman, are gratefully acknowledged. To Dr. DeWitt Stetten, Jr., we are much indebted for an Evening Lecture, "A Message from Kos" (the island traditionally identified with Hippocrates).

Welcome financial support for the symposium was provided by a grant from the National Science Foundation.

Henry J. Vogel

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In Vitro DNA Replication Catalyzed by Six Purified T4 Bacteriophage Proteins

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