

PROMOTERS

Structure and Function

Edited by

Raymond L. Rodriguez

Michael J. Chamberlin

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*Department of Genetics,
University of California, Davis*

Michael J. Chamberlin

*Department of Biochemistry,
University of California, Berkeley*

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SPEAKERS, CONVENERS, AND ORGANIZERS

Dr. Daniel Bogenhagen
Department of Embryology
Carnegie Institute of Washington
Baltimore, Maryland

Dr. Hermann Bujard
Molekulare Genetik der Universitat
Heidelberg, West Germany

Dr. Richard R. Burgess
McArdle Laboratory for Cancer Research
University of Wisconsin
Madison, Wisconsin

Dr. Ronald Cape*†
Cetus Corporation
Berkeley, California

Dr. Marvin H. Caruthers
Department of Chemistry
University of Colorado
Boulder, Colorado

Dr. Malcolm Casadaban
Department of Biophysics and Theoretical Biology
University of Chicago
Chicago, Illinois

Dr. Michael J. Chamberlin*†
Department of Biochemistry
University of California
Berkeley, California

*Conveners

†Organizers

Dr. Pierre Chambon
LGME Faculté de Médecine
Strasbourg, France

Dr. Shing Chang
Cetus Corporation
Berkeley, California

Dr. Ronald W. Davis
Department of Biochemistry
Stanford University Medical Center
Stanford, California

Dr. Herman A. DeBoer
Genentech, Inc.
South San Francisco, California

Ms. Crystal DiModica[†]
Department of Genetics
University of California
Davis, California

Dr. Roy Doi^{*}
Department of Biochemistry and Biophysics
University of California
Davis, California

Ms. June Galliher[†]
Department of Genetics
University of California
Davis, California

Dr. Jay D. Gralla
Molecular Biology Institute
University of California
Los Angeles, California

Dr. Herbert L. Heyneker
Genentech, Inc.
South San Francisco, California

Dr. Ellis L. Kline
Department of Microbiology
Clemson University
Clemson, South Carolina

Dr. Sidney R. Kushner
Department of Biochemistry
University of Georgia
Athens, Georgia

Dr. William R. McClure
Department of Biological Sciences
Carnegie-Mellon Institute
Pittsburgh, Pennsylvania

Dr. David J. McConnell*
Department of Genetics
Trinity College
Dublin, Ireland

Dr. Janice Pero
Biological Laboratories
Harvard University
Cambridge, Massachusetts

Dr. William S. Reznikoff
Department of Biochemistry
University of Wisconsin
Madison, Wisconsin

Dr. Thomas M. Roberts
Biological Laboratories
Harvard University
Cambridge, Massachusetts

Dr. Raymond L. Rodriguez*†
Department of Genetics
University of California
Davis, California

Dr. Robert G. Roeder
Department of Biological Chemistry
Division of Biology and Biomedical Science
Washington University School of Medicine
St. Louis, Missouri

Dr. Martin Rosenberg
Chief of the Cellular Regulation Section
Laboratory of Biochemistry
National Cancer Institute
National Institutes of Health
Bethesda, Maryland

Dr. Robert B. Simpson
Department of Microbiology
University of Washington
Seattle, Washington

Dr. Carol A. Talkington
Laboratory of Molecular Genetics
National Institute of Child Health and Human Development
National Institutes of Health
Bethesda, Maryland

Dr. Andrew A. Travers
MRC Laboratory of Molecular Biology
Cambridge, England

Dr. Daniel Vapnek
Department of Genetics
University of Georgia
Athens, Georgia

Dr. Peter H. von Hippel*
Institute of Molecular Biology
University of Oregon
Eugene, Oregon

Dr. James C. Wang
Department of Biochemistry and Molecular Biology
Harvard University
Cambridge, Massachusetts

Dr. Gary Wilcox
Department of Microbiology and Molecular Biology Institute
University of California
Los Angeles, California

Dr. Helen R. Whitely
Department of Microbiology
University of Washington
Seattle, Washington

Dr. Philip Youderian
Department of Molecular Genetics and Microbiology
University of Massachusetts Medical School
Worcester, Massachusetts

Dr. Geoffrey Zubay
Department of Biological Sciences
Columbia University
New York, New York

PREFACE

In the simplest of terms, a promoter is that sequence of DNA nucleotides responsible for the initiation of transcription of genetic sequences. The biochemical events in transcription involve a series of highly specific interactions between regulatory sequences in DNA and the cellular enzyme RNA polymerase that catalyzes the transcription reaction. Transcription is the first step in gene expression and is of major importance in the regulation of gene expression in both prokaryotic and eukaryotic organisms. The availability of recombinant DNA techniques has enabled promoters and structural genes from a variety of organisms to be mixed and matched at will. Microorganisms harboring these new gene combinations have already been used to overproduce gene products of both academic and industrial importance. Consequently, it is easy to see why the structure and function of promoters has become one of the most intriguing subjects in the field of molecular biology.

However, not since 1964 when the term promoter was first coined by Francois Jacob and his co-workers has there been a symposium dealing exclusively with this subject. This makes the symposium "Promoters: Structure and Function," held in Monterey, California on May 18-20, 1981, unique, and long overdue. This volume is a collection of original research papers presented at the Monterey meeting. Individual chapters cover topics ranging from mechanistic characterizations of bacteriophage promoters to structural analysis of the promoters for the mouse globin genes. The first two chapters are intended to serve as both an introduction and an overview of prokaryotic promoters; the last two describe some of the methods currently in use that allow for the manipulation of regulatory DNA sequences and the creation of new and more efficient modes of gene regulation. Our primary objective in publishing these proceedings is to bring together, in one place, the important observations and developments in recent promoter research. We also wish to encourage a fresh look at some of the old problems in the understanding of promoter research. In order to provide a forum for as much recent work as possible, poster session abstracts are included in the appendix to this volume.

We wish to thank R. E. Cape of Cetus Corporation, Berkeley, California, and D. L. McLean, dean of the Division of Biological Sciences, University of California, Davis, for their encouragement and help in finding financial support for this symposium. A special debt of gratitude goes to Crystal DiModica, June Galliher, and all the U.C. Davis graduate students who took part in the organization of this conference and who were essential to its success. Finally, we thank all the speakers and participants whose participation and cooperation helped make this symposium both an enlightening and lively event.

Raymond L. Rodriguez
Michael J. Chamberlin

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PART I

RNA POLYMERASE— PROMOTER INTERACTIONS

