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Bernard R. Glick and Jack J. Pasternak

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BACTERIAL PATHOGENESIS
A MOLECULAR APPROACH
Abigail A. Salyers, Ph.D., and Dixie D. Whitt, Ph.D.

Bacterial Pathogenesis: A Molecular Approach is the first text designed to provide a comprehensive introduction to this dynamic field for both students and researchers. The application of molecular techniques to the study of bacterium-host interaction has made possible great progress in fundamental understanding of the molecular basis of infectious diseases. In the text the authors integrate material from pathogenic microbiology, molecular biology, immunology, and human physiology to provide a complete but accessible overview of the field. The text is engagingly written with more than 150 color diagrams to help students clearly understand the molecular mechanisms of pathogenesis. Boxed highlights are included in all of the chapters and cover material of special clinical and historical interest. Each chapter concludes with a detailed summary, a list of selected readings, and a set of study questions. An extensive glossary is included at the end of the book.

"This wonderful book by Abigail Salyers and Dixie Whitt fills the need for a textbook designed to introduce students at all levels into the field of bacterial pathogenesis. The authors have done a splendid job of capturing the rich excitement that pervades the field, they have portrayed the interdisciplinary nature of the field, and they have woven enough cell biology and cellular immunology into their text to do justice to the breadth of this experimental specialty."
— Stanley Falkow, Stanford University (from the Foreword)

"I think this book will be tremendously useful to instructors of upper division undergraduate and graduate courses on microbial pathogenesis. I have long felt the need for such a book."
— Virginia Miller, UCLA

"I commend the authors on a very thorough and thoughtful job and I assure you I will use the book in my course."
— Elaine Tuomanen, Rockefeller University

CONDENSED CONTENTS
Foreword by Stanley Falkow
Part I. Introduction to the Host-Parasite Interaction (8 chapters)
Part II. Paradigms of Bacterial Disease (15 chapters)
Part III. Future Challenges (7 chapters)

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T he importance of gram-positive bacteria in infectious disease and industrial fermentation and the interesting biology of their many diverse species has dictated the need for a solid reference book that brings together research on their architecture, biochemical pathways, genetic organization, and gene regulation.

This unique book, written by the world's experts in their areas, contains more than 60 chapters devoted to the most important aspects of gram-positive bacteria, accompanied by tables and figures that serve as very accessible references for essential facts. Modelled on the highly successful ASM publication *Escherichia coli and Salmonella typhimurium: Cellular and Molecular Biology*, it reflects the recent and rapid advances in studying gram-positive bacteria and makes useful comparisons among diverse groups of microorganisms. Since *Bacillus subtilis* is the gram-positive bacterium that has been studied in the greatest detail, it serves as the major point of reference in most cases.

*Bacillus subtilis* is essential for both academic and industrial researchers in the field and is a valuable reference work for other microbiologists wishing to keep up with the latest in the gram-positive world.

CONDENSED CONTENTS

I. Gram-Positive Bacteria

II. Metabolism and Its Regulation

III. Cell Envelope

IV. Chromosome Structure

V. Chromosome Replication, Modification, and Repair

VI. Genetic Exchange and Genetic Engineering

VII. Transcription and Translation Machinery

VIII. Post-Exponential Phase Phenomena

IX. Bacteriophages

X. Production of Commercial Products
MYXOBACTERIA II

Editors: Martin Dworkin and Dale Kaiser

The myxobacteria have become one of the premier model systems for examining questions of prokaryotic development. They have been referred to as "social bacteria" and go through a complex life cycle involving cellular morphogenesis, fruiting body formation, and a variety of cell-cell interactions. Myxobacteria have been experimentally domesticated and are amenable to the most sophisticated genetic, molecular, and biochemical manipulations.

Written by investigators from the leading myxobacterial laboratories in the world, Myxobacteria II brings the reader up-to-date on the various aspects of myxobacterial biology, development, and social behavior. The chapters review cell-cell signaling, the cell surface, protein kinase cascades, the nature of the genome, genetic approaches, developmental autolysis, protein export, myxospore and fruiting body morphogenesis, production of bioactive secondary metabolites, genetics and physiology of carotenoid synthesis, retron, motility and tactic behavior, and transcriptional regulation of development.

Contents

1. Roland Thaxter and the Myxobacteria
2. Biology of the Myxobacteria: Ecology and Taxonomy
3. Cell Surfaces and Appendages
4. The Myxobacterial Genome
5. Retron Elements of the Myxobacteria
6. Genetic Approaches for Analysis of Myxobacterial Behavior
7. Genetics of Regulation and the Pathway of Synthesis of Carotenoids
8. Transcriptional Regulation of Developmental Gene Expression in Myxococcus xanthus
9. Developmental-Specific Gene Expression: Protein Serine/Threonine Kinases and Sigma Factors
10. Developmental Lysis and Autocides
11. Protein Secretion in Myxobacteria
12. Intercellular Signaling
13. Motility and Tactic Behavior of Myxococcus xanthus
14. Myxospore and Fruiting Body Morphogenesis
15. Stigmatella aurantiaca, an Organism for Studying the Genetic Determination of Morphogenesis
16. Production of Bioactive Secondary Metabolites


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ASM Press, P.O.Box 605, Herndon, VA 22070 USA. Phone: (703) 787-3305. Fax: (703) 689-0660.
This valuable book covers the important use of bacterial and other microbial systems in industry. It brings together the work of leading researchers who seek to maximize the industrial potential of these organisms for development of pharmaceutical products.

The contents are based on the proceedings of the Fifth ASM Conference on the Genetics and Molecular Biology of Industrial Microorganisms (Bloomington, Ind., 1992) which returned to a focus on prokaryotes and lower eukaryotes. The book offers a balanced coverage of streptomycetes, fungi and yeasts, and other bacteria, including Escherichia coli as well as emerging bacterial systems. The topics reflect major trends in research that have potential immediate and future industrial applications. The abstracts of the posters presented at the 1992 conference are included in this volume. Contributors were drawn in nearly equal numbers from industry and academia, and from more than a dozen countries. Chapters range from detailed accounts of well-developed systems with established practical applications to reports of progress and accounts of microbial systems that are just becoming accessible to genetic manipulation and exploitation.

Professional researchers and scientists interested in drug development and use of microbial systems for pharmaceutical product development will find this book useful.

**CONDENSED CONTENTS**

Part 1. Global Regulatory Mechanisms (3 chapters)
Part 2. Gene Transfer and Mapping (5 chapters)
Part 3. Regulation of Transcription and Translation (2 chapters)
Part 4. Emerging Microbial Systems (5 chapters)
Part 5. Heterologous Gene Expression and Secretion (4 chapters)
Part 6. Genetics of Secondary Metabolite Biosynthesis (13 chapters)
Appendix: Abstracts of Posters
Indexes


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New volume summarizes the latest research on bacterial sporulation

REGULATION OF BACTERIAL DIFFERENTIATION

Editors: Patrick J. Piggot, Charles P. Moran, Jr., and Philip Youngman

Since 1956, ASM conferences on bacterial sporulation have served to summarize the progress in this field. Participants at the latest meeting (Eleventh International Spores Conference, Woods Hole, Mass., 1992) found that the study of bacterial sporulation continues to offer unique insights into fundamental biological problems including several aspects of cell differentiation, the control of cell division and morphogenesis, the repair of DNA damage, and the function of multiple types of transcription factors found in a wide variety of bacteria (e.g., RNA polymerase sigma factors, anti-sigma factors, and phosphorylated DNA-binding proteins). In order to include background literature as well as recent developments, this volume consists of review articles rather than research papers.

Microbiologists, biotechnologists, scientists in the food and pharmaceutical industries, molecular biologists, and workers interested in cellular differentiation will greatly benefit from this new volume.

CONTENTS
1. Signal Transduction Network Controlling Degradative Enzyme Synthesis and Competence in Bacillus subtilis (Frank Kunst, Tarek Msadek, and Georges Raijnout)
2. Regulation of Gene Expression at the Onset of Stationary Phase in Escherichia coli (Gjalt Huismann and Roberto Kolter)
3. The Phosphorelay Signal Transduction Pathway in the Initiation of Sporulation (James A. Hoch)
4. Regulation and Integration of Antibiotic Production and Morphological Differentiation in Streptomyces spp. (Wendy C. Chapple and Keith F. Charter)
5. Asymmetric Septation in Bacillus subtilis (Joe Lutkenhaus)
7. Establishment of Compartment-Specific Gene Expression during Sporulation in Bacillus subtilis (Patrick Stragier, Peter Margolis, and Richard Losick)
8. Intercellular and Intercompartmental Communication during Bacillus subtilis Sporulation (Lee Kroos and Simon Cutting)
9. DNA Structure, Spore Formation, and Spore Properties (Peter Selwyn)
11. A Few Good Genes: Developmental Loci in Bacillus subtilis (Patrick Stragier)


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A major revision of the classic Manual of Methods for General Bacteriology

METHODS FOR GENERAL AND MOLECULAR BACTERIOLOGY


This is the long awaited revision of ASM’s extremely popular Manual of Methods for General Bacteriology (1981, Gerhardt et al.). In keeping with the immense impact molecular biology has had on bacteriology and to accurately reflect the revised contents, the title of the new edition has been changed to Methods for General and Molecular Bacteriology (MGMB).

The objective of MGMB remains the same as for its popular predecessor: “to meet the need for a compact, moderately priced handbook of reliable, basic methods for practicing general bacteriology in the laboratory.” As a laboratory methods manual, MGMB covers all kinds of bacteria, archaeabacteria as well as eubacteria, complementing systematics treatises such as Bergey’s Manual of Systematic Bacteriology and The Prokaryotes.

Nine new chapters include the new methodology in molecular genetics, systematics, antigen-antibody reactions, photography, and records and reports. Chapters from the earlier edition have been extensively reviewed, updated, and expanded.

Painstakingly written by leading scientists and carefully revised over the past three years, MGMB offers researchers, teachers, students, and all who work in laboratories with any kind of bacteria, an authoritative guide to both the latest and classic techniques so crucial to doing good science with prokaryotes. Written in the tradition of ASM’s classic manuals, MGMB will serve as a valuable reference and teaching tool for any microbiology laboratory.

CONDENSED CONTENTS (Section Editor)
Methodology for General and Molecular Bacteriology (Philipp Gerhardt)

I. Morphology (R. G. E. Murray; 5 chapters, 1 is new)
II. Growth (Philipp Gerhardt; 7 chapters)
III. Molecular Genetics (Philipp Gerhardt; 8 chapters, 4 are new)
IV. Metabolism (Willis A. Wood; 4 chapters)
V. Systematics (Noel R. Krieg; 4 chapters, 2 are new)
VI. General Methods (Philipp Gerhardt; 3 chapters, 2 are new)


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Editor in Chief: Arnold J. Levine

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