

Resources For The Soil Scientist

NEW

SOIL MICROBIOLOGY AND BIOCHEMISTRY

E.A. Paul and F.E. Clark

Soil Microbiology and Biochemistry

E. A. Paul and F. E. Clark



Soil Microbiology and Biochemistry encompasses the broad spectrum of soil organisms and the dynamic processes carried on by them, including ecological relationships in the biota, the dynamics of the carbon and nitrogen cycles, and microbe-driven reactions involving sulfur, phosphorous, and metals. This reference source will prove invaluable to anyone involved in the study of agricultural and nonagricultural soils.

This book provides:

- a process-oriented approach on nutrient cycling and fundamental soil processes for students who are studying soil microbiology and biochemistry
- an up-to-date assessment of the diverse systems affected by soil organisms for researchers in the fields of agronomy, environmental quality, and natural sciences
- the application of molecular biology to soil organisms, mathematic modeling of soil

processes, a supplementary reading list, and a glossary.

January 1989, 273 pages
\$39.95/ISBN: 0-12-546805-9

Three Classics In the Field by Daniel Hillel...

INTRODUCTION TO SOIL PHYSICS

Daniel Hillel

1982, 364 pages, \$32.95
ISBN: 0-12-348520-7

FUNDAMENTALS OF SOIL PHYSICS

1980, 413 pages, \$49.00
ISBN: 0-12-348560-6

APPLICATIONS OF SOIL PHYSICS

1980, 385 pages, \$49.00
ISBN: 0-12-348580-0

ION TRANSPORT IN PROKARYOTES

edited by

Barry P. Rosen and Simon D. Silver

In the rapidly progressing field of ion transport and prokaryotic organisms, this is the first monograph to specifically deal with bacterial ion transport. The chapters have been compiled from primary literature and include for the first time information on plasmid-encoded transport systems.

1987, 332 pages, \$75.00
ISBN: 0-12-596935-X

NEW

KINETICS OF SOIL CHEMICAL PROCESSES

Donald L. Sparks

This is the first publication to present a comprehensive treatment on the rates of reactions in soil environments. To properly understand the effect of applied fertilizers, pesticides, and organic pollutants with time, the study of kinetics is essential.

Students and researchers in soil science and applied fields will learn:

- the different kinetic methodologies, their advantages and disadvantages, and how one can interpret the data gained from them
- the reactions on soil and soil constituents and how they can be measured using pressure-jump relaxation (p-jump), stopped flow, and electric field pulse techniques
- the rates and mechanisms of the interactions of pesticides and organic pollutants with soil
- the kinetics of chemical weathering, including dissolution rates and mechanisms of feldspar, oxide, and ferromagnesian minerals
- how to use mathematical modeling and computer simulation to model reactions kinetically in order to predict the fate of applied fertilizers, pesticides, and toxic organics with time in soil and aquatic environments.

February 1989, 210 pages
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180 pages, illustrated, index

ASM

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Phosphate Metabolism and Cellular Regulation in Microorganisms

Editors: Annamaria Torriani-Gorini, *Massachusetts Institute of Technology, Cambridge, MA*; Frank G. Rothman, *Brown University, Providence, RI*; Simon Silver, *University of Illinois College of Medicine, Chicago, IL*; Andrew Wright, *Tufts University Medical School, Boston, MA*; and Ezra Yagil, *Tel Aviv University, Tel Aviv, Israel*

This important new volume presents the latest progress on DNA sequencing and analysis of phosphate transport systems, the Pho regulon and other regulons governing "global metabolism" in the cell, polyphosphates and their synthesis and degradation, and the export of proteins across the cell membrane. *Phosphate Metabolism and Cellular Regulation in Microorganisms* will be of interest to anyone investigating bacterial metabolism and molecular biology; it will also be of general interest to those with environmental concerns and interests in phosphate metabolism in higher organisms, both plants and animals. The work contains the proceedings of an international symposium held in Concarneau, France, June 1986.

CONDENSED CONTENTS

I. Phosphate Regulation in *Escherichia coli* (5 chapters)

Pho regulon, alkaline phosphatase gene, PhoF protein, acid phosphatase

II. Phosphate Regulation in Diverse Organisms (4 chapters)

Bacillus licheniformis, *Saccharomyces cerevisiae*

III. Protein Secretion and Use of Alkaline Phosphatase (7 chapters)

E. coli: phosphate-binding-protein synthesis/export, phospholipids, foreign-protein secretion, *lamB* protein; alkaline phosphatase uses

IV. Structure and Function of Alkaline Phosphatase (4 chapters)

Site directed mutagenesis, crystal structure, multinuclear NMR analysis, *E. coli* isozyme

V. Transport of Phosphate and Phosphorylated Compounds in *Escherichia coli* (7 chapters)

Pst system, Pit system, PhoE protein, glycerol 3-phosphate transport

VI. Mechanisms and Energetics of Phosphate Transport in Other Organisms (4 chapters)

Pseudomonas aeruginosa outer membrane protein, sugar phosphate transport/anion exchange, solute ion transport, *S. cerevisiae* phosphate uptake

VII. Phosphate Reserves and Energy Storage: polyphosphates (5 chapters)

E. coli accumulation metabolism, *Acinetobacter lwoffi* surface pool, *Propionibacterium shermanii* polyphosphate kinase and glucokinase, biosynthesis and transport in yeasts

VIII. Phosphate Reserves and Energy Storage: Pyrophosphates (4 chapters)

NMR methanogen studies, inorganic pyrophosphate-supplied metabolic energy, *Rhodospirillum rubrum* energy conversion, pyrophosphate metabolism in plants

IX. Global Regulatory Systems in Enteric Bacteria (6 chapters)

Carbon metabolism, nitrogen assimilation, stable-RNA transcription initiation, phosphorylated metabolites alarmones, *E. coli* DNA damage stress responses

X. Historical Perspective: *E. coli* alkaline phosphatase gene protein relationships

Publication date: July 1987. Hardcover (ISBN 0-914826-94-8)
328 pages, illustrated, index.

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Molecular Aspects of Picornavirus Infection and Detection

Edited by **Bert L. Semler**, University of California, Irvine, and
Ellie Ehrenfeld, University of Utah Medical School, Salt Lake City

In the past two years, giant strides have been made in our knowledge of the molecular biology and structure of picornaviruses. The complete three-dimensional structures of rhinovirus and poliovirus have now been solved through X-ray crystallographic studies, yielding much important information about the antigenic regions of viral proteins and the relationship of viral structure to antibody accessibility, with important implications for vaccine design. These three-dimensional structures have provided new insight into the mechanism of action of several antiviral compounds.

This very timely book presents our current understanding of the biology of these viruses in the context of clinical implications. Virologists, molecular biologists, and clinical researchers will all find this book useful and interesting reading. Based on the 1988 ICN-UCI International Conference on Virology, Newport Beach, Calif.

CONTENTS

I. Molecular Biology of Viral Replication: Use of Mutagenesis Cartridges in Molecular Genetic Analyses of Poliovirus (Bradley et al.); Replication of Hepatitis A Virus (Ticehurst et al.); Comparison of Encephalomyocarditis Virus and Poliovirus Translation Initiation and Processing In Vitro (Jackson); Molecular Biology and Genetics of Poliovirus Protein Processing (Dewalt and Semler); Poliovirus RNA Polymerase Expressed in *E. coli* (Ehrenfeld and Richards); A Large Segment of Poliovirus 5'

Noncoding Region Allows Cap-Independent Translation of Downstream Sequences in Mammalian Cells (Trono et al.)

II. Virion Structure and Cell Surface Interactions: Structural Basis for Serotypic Differences and Thermostability in Poliovirus (Hogle et al.); Conformational Adaptations by Picornaviruses to Antiviral Agents and pH Changes (Rossmann); Neutralization of Picornaviruses (Mosser et al.); Molecular and Biochemical Aspects of Human Rhinovirus Attachment to Cellular Receptors (Colonno et al.); Towards a Molecular Vaccine for Foot-and-Mouth Disease (Brown); Antigenic Structure of Hepatitis A Virus (Lemon and Ping)

III. Genetic Determinants of Viral Disease and Applications to Diagnosis: Sequence Alignments of Picornaviral Capsid Proteins (Palmenberg); Human Enterovirus Infections (Rotbart); Modification of Six Amino Acids in the VP1 Capsid Protein of Poliovirus Type 1, Mahoney Strain (Girard et al.); Genetic Analysis of Neurovirulence, Using a Mouse Model for Poliomyelitis (Racaniello et al.); Expression of the Attenuation Phenotype of Poliovirus Type 1 (Nomoto et al.); Attenuation and Reversion of the Sabin Type 3 Vaccine Strain (Minor et al.)

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MICROBIAL MATS

Physiological Ecology of Benthic Microbial Communities



Editors: **YEHUDA COHEN**, *Interuniversity Institute of Eilat, Eilat, and*
EUGENE ROSENBERG, *Tel Aviv University, Ramat Aviv, Israel*

Microbial mats are probably the oldest form of life on earth as witnessed in the fossil record. They are common in a large spectrum of environments and play a key role in elemental transformations. Microbial mats pose interesting evolutionary questions now being addressed through comparative physiology and analysis of molecular structure, and benthic microbial mats provide fascinating ecosystems for the study of microbial adhesion, growth and development at interfaces, cell-to-cell interactions, and metabolic interlock among closely interacting microbial communities.

This book focuses on microbial processes in microbial mats and their interaction with the environment of deposition. It is based on an international conference held in Eilat, Israel, in September 1987.

CONDENSED CONTENTS

- I. Environments of Depositions** (8 chapters by Ward et al., Belkin and Jannasch, Cohen, Guerrero and Mas, Zohary, Oren, de Winder et al., and Lazar et al.)
- II. Structure and Function of Benthic Microbial Communities** (9 chapters by D'Amelio et al.,

Dor and Paz, Jørgensen, Palmisano et al., Revsbech et al., Ghiorse, Skyring et al., Oremland and King, and Des Marais et al.)

- III. Regulation of Adhesion and Hydrophobicity of Cell Surfaces in the Formation of Microbial Mats** (6 chapters by Shilo, Bar-Or et al., Rosenberg et al., Low and White, Marshall, and Rosenberg)

- IV. Physiology of Major Mat-Building Microorganisms** (10 chapters by Stal et al., Padan, Caumette, Post et al., van Gemerden and de Wit, de Wit and van Gemerden, Paerl et al., Truper and Galinski, Kuenen, and Wimpenny)

- V. Evolution of Mat-Forming Photosynthetic Prokaryotes** (3 chapters by Avron, Turner et al., and Pierson and Olson)

- VI. Biogeochemistry of Microbial Mats** (4 chapters by Aizenshtat, Ward et al., Fredrickson et al., and Knoll)

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