

PREFACE

Benson's Microbial Applications has been the "gold standard" of microbiology laboratory manuals for over 30 years. This manual has a number of attractive features that resulted in its adoption in universities, colleges, and community colleges for a wide variety of microbiology courses. These features include "user friendly" diagrams that students can easily follow, clear instructions, and an excellent array of reliable exercises suitable for beginning or advanced microbiology courses.

In revising the tenth edition, I have tried to maintain these important strengths and further enhance the manual by updating exercises and making the bacterial nomenclature more consistent with the first edition of *Bergey's Manual of Systematic Bacteriology*. The second edition of *Bergey's Manual* is in publication but is incomplete at this time.

Organizational Changes

Changes to the 11th edition include:

- The safety rules have been rewritten to be more consistent with rules and regulations that apply to student laboratories.
- A new table of the organisms used in the manual has been introduced. The table includes the current accepted name of the organism, its ATCC number, Gram stain and morphology, its habitat, its biosafety level, and the exercise in which the organism is used.
- The exercises on the protozoa and algae (Exercise 5) and the fungi (Exercise 7) in the Survey of Microorganisms have been revised. The new exercises have been updated with the current taxonomy of these two groups of microorganisms.
- The existing photographs of the simple, acid-fast, Gram, capsule, and spore stains in Part 2, Survey of Microorganisms, have been replaced with new photos. Also, a new photo of a negative stain has been added.
- The introductory material in Exercise 19, Cultivation of Anaerobes, has been expanded to include a revised listing of organisms and a discussion of how oxygen affects different groups of bacteria. The discussion also includes comments on the nature of sensitivity of anaerobes to oxygen.
- Exercise 31 on The Effects of Lysozyme on Bacterial Cells has been revised. The new exercise includes an expanded discussion on wall structure and the role of teichoic acids in the gram-positive bacterial cell wall. The exercise also includes testing human saliva as a source of lysozyme. The effects of lysozyme on gram-positive and negative cells are discussed and how the presence of

teichoic acids in the cell wall of *Staphylococcus aureus* inhibits the action of lysozyme.

- The table on antimicrobial disks in Exercise 33, Antimicrobial Sensitivity Testing, has been expanded to include more antimicrobics. Also included are the potency values for each antimicrobial disk and specific values for sensitive, intermediate, and resistant categories for various organisms. The introductory material now includes definitions for antibiotics, antimicrobics, and semi-synthetic and synthetic compounds.
- Figures and flow charts in Exercises 38 and 39 for the identification of an unknown have been revised and modified to make them more easy to follow.
- The introductory material in Exercise 46, Bacterial Counts of Food, has been expanded. This section now includes a discussion on the association of bacteria with foods. It also addresses how foods are important in foodborne diseases and how counts may or not be important in transmission of disease.
- The introductory section of Exercise 55, Slide Agglutination Test, has been expanded to include a more detailed discussion of antigens and the antibody response.

Laboratory Reports

The laboratory reports are designed to guide and reinforce student learning and provide a convenient place for recording data. The reports consist of observation sections, results sections, short answer questions, multiple-choice questions, and fill-in-the-blank questions. Instructors may choose to either post the answer key from the instructor's manual so students can check their work or collect and grade the laboratory reports.

Instructor's Manual

The accompanying instructor's manual provides: (1) a listing of equipment and supplies needed for performing all of the experiments, (2) procedures for setting up the experiments, and (3) answers to all the questions for the laboratory reports. The instructor's manual can be found at www.mhhe.com/labcentral. Please contact your sales representative for additional information.

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