

PREFACE

This handbook has been prepared for you, a microbiology student, with concise instructions for carrying out the manipulations and procedures that are fundamental in the microbiology laboratory. These are the techniques that you will frequently and often repeatedly use as you study bacteria in the laboratory. To help you visualize the "how-to-do-it" aspect of these techniques, instructive graphics are included. Color artwork clearly illustrates each step in a procedure.

The laboratory techniques and procedures presented in this handbook have been compiled from recommendations made by microbiology instructors who teach at two-year, four-year, and research colleges and universities. And most importantly, these techniques include those skills considered essential for the introductory microbiology laboratory core curriculum, as collectively prepared by members of the education community in the American Society for Microbiology.

Even though most of the bacteria you will encounter in the instructional microbiology laboratory are not particularly good at infecting healthy people, some do have this potential. To protect you from unwanted intrusion of your body by these microscopic creatures, safety is emphasized in this handbook.



Where appropriate, safety issues that must be kept in mind when you carry out a particular technique are highlighted by the icon shown to the left.

To help you work through those inevitable glitches that happen the first time you perform an unfamiliar procedure, a Troubleshooting section is included for many procedures. You will find tips for preventing and overcoming these "bumps in the road."

You have probably noticed that this handbook is smaller than lab manuals that you have used in other courses. This convenient size is intentional. The handbook will take up less space on the lab bench top, reducing the chance that you might spill growth media with bacteria on its pages. It has been designed to minimize turning pages as you follow the concise text and graphics. And the compact size also means less weight in your backpack. If you happen to slip the handbook into your lab coat pocket, do not forget to take it with you when you have finished your work.

When you master the techniques presented in the six thematic units of this handbook, you will be competent in culturing and handling bacteria, visualizing these microscopic creatures, identifying bacteria on the basis of their staining characteristics and their complement of enzymes that allow them to utilize substrates in the environment, estimating their number (including bacterial viruses), and determining the effectiveness of antibacterial

chemicals. You can then use these skills for more-in-depth studies of bacteria and bacteriophage.

This visual guide to microbiology laboratory techniques and procedures complements an in-house or commercial lab manual. It is also quite appropriate for a microbiology course with a lab component that focuses on discovery or is investigation oriented.

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If you find some step in a technique is incorrectly stated, if you think of a more effective presentation of a procedure, or if you wish an additional technique had been included, please contact me. I continue to enjoy conversations with other microbiology educators and to delight in learning new ways to facilitate learning by my students.

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