**ORGANIZATION**

This Instructor’s Handbook includes information that falls in three distinct categories: 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 on the Laboratory Reports. These three categories of information have been designated as Sections A, B, and C, respectively.

**Section A** provides separate lists for equipment, supplies, cultures, and biologicals.

**Section B** attempts to identify any problems that might occur with the individual experiments to minimize experimental failures. No attempt is made to completely describe or justify each experiment in this section; only those problems that have been encountered with each experiment will be pointed out here. It is a good idea to read over each experiment before consulting this section to uncover any problems that might occur. Furthermore, alternative approaches and complementary procedures are suggested as enhancements for many of the exercises.

Section B also provides time allotments for each exercise. Each designated time is an approximation of the actual time required for the student in the laboratory. These times should be helpful in preparing a laboratory schedule. Although material lists are also given here for each exercise, *it is best to refer to the material lists in the manual at the beginning of each experiment when setting up the laboratory.*

**Section C** provides answers to the questions on the Laboratory Reports. The Table of Contents in this Handbook is set up in such a way that one can quickly gain access to each portion of the Handbook.

Basic Microbiology Laboratory Safety is reviewed in the manual on pages xi–xii. Pages xiv–xvi contain a comprehensive list of microorganisms used and/or isolated in these exercises, along with their biosafety level and ATCC code. Instructors are strongly encouraged to study material safety data sheets (MSDS) for all reagents and organisms used in the laboratory, and to review the exercises with their institution’s biosafety committee.

**SECTION A**

**EQUIPMENT, SUPPLIES, AND CULTURES**

**A. Individual Student Supplies.**  Each student should have a cabinet, drawer, or locker that contains the following items:

Bunsen burner

cover glass

eye protection

immersion oil

inoculating loop

inoculating straight wire

lab coat

labeling tape

lighter, flint

mechanical pipetting device

paper, bibulous

paper, lens

Sharpie® marking pen

slide holder (wooden clothespin)

slides, depression

slides, plain microscope

**B. General Items.** The following items should be available either at the student desk or at a nearby cabinet.

brightfield microscope

Bon Ami®

bulk staining reagents (for replenishing kits)

disinfectant for desktops

disposable latex/nitrile gloves

electric hot plates

Kimwipes®

metric rulers (small plastic) pipette jars (plastic)

scissors

sponges for disinfectant

staining kits (Simple, Gram, Spore, Acid-fast)

test tube caps

thermometer (0º–110ºC)

toothpicks (sterile)

tripod

Vaseline®

wash bottles

wire basket

wire gauze

**C. Equipment.** Except for asterisked (\*) items, the following are used in experiments in these manuals. The asterisked items are either convenience items or preparation room equipment.

acid and base kits

antimicrobic disk dispensers

autoclave

\*automatic pipetting machine

balance, analytical

basins, surgical, stainless steel

blender, Waring

blood-typing slide warmer

calibrated inoculating loops (.01 and .001)

cart, stainless steel

centrifuges

counters, hand tally type

\*digital video microscope

dishwasher, automatic

dissecting microscope

electrophoresis chambers and power supplies

\*electroporator and cuvettes

filter assemblies, Millipore

fluorescent microscope

forceps

freezer (–20ºC and \*–80ºC)

GasPak jar

incubators

lamps, incandescent

lamps, ultraviolet

micropipettors (P10, P20, P200, P1000)

\*microwave oven

ocular micrometers

pH meter, electronic

phase-contrast microscopes

\*pipette washer, automatic

Quebec colony counters

refrigerators

slide rotator

spectrophotometer and cuvettes

stage micrometers

thermocycler

timers

UV transilluminator and photodocument system

vacuum pump with rubber hose

Vortex mixers

water baths, various sizes

\*water distiller or deionizer