

Challenges of the **Unseen World**

A LABORATORY COURSE IN MICROBIOLOGY

Solving real-world health challenges in a learning environment

You are at an exciting gateway into the world of microorganisms. With nothing more than basic lab equipment such as microscopes, Petri dishes, media, and a handful of reagents, you will learn to isolate, grow, and identify bacteria that live all around us. This is no ordinary microbiology laboratory course; not only will you learn how to streak plates, use a microscope, perform a Gram stain, and prepare serial dilutions and spread plates—fundamental skills found in every microbiologist's toolkit—you will solve a series of public health-related challenges that many professional microbiologists encounter in their work.

By the end of this course, you will:

- **Determine the origin of a nosocomial infection.** Using foundational and molecular methods, you will determine whether the infections occurring in hospitalized patients are the result of contaminated medical items.
- **Select the antibiotic to treat a patient with Crohn's disease.** You will find minimum inhibitory concentrations of various antibiotics for a *Pseudomonas* strain associated with Crohn's disease.
- **Pinpoint the source of lettuce contaminated with *E. coli*.** Using molecular tools, you will investigate a common food safety challenge, antibiotic-resistant *E. coli*, and the potential for spread of this resistance in the environment.
- **Find the farm releasing pathogens into a stream used for drinking water.** Using bacteriophage load in water samples, you will locate the source of fecal contamination in the water supply of a village in an underdeveloped country.
- **Evaluate the potential of bacteria to cause a urinary tract infection.** You will test for biofilms, quorum-sensing behavior, and chemotaxis and assess which disinfectants would be most effective for sanitizing contaminated surfaces.

Microbiology educators and researchers Richard Meyer and Stacie Brown have created this hands-on, engaging introduction to the essential laboratory skills in the microbial sciences that is sure to change the way you view the world around you.



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SOCIETY FOR
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