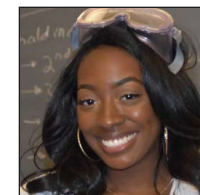


BOOK REVIEW:
LAB MANUAL –
“MICROBIOLOGY–
THE LABORATORY
EXPERIENCE” (STEVE
KEATING)

W.W. NORTON & COMPANY,
ISBN 978-0-393-92364-3



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INTRODUCTION

In *Microbiology: The Laboratory Experience*, author Steve Keating takes lab manuals where they have not gone before. He states his purpose, "... to write a microbiology lab manual as a means of speaking directly to students to increase their interest and understanding of the subject and to decrease the number of mistakes." Through his dedication to providing students with a manual that is interesting, simple yet informative, engaging, and inclusive, Keating presents the most impressive lab manual I have seen as an undergraduate student.

CONTEXT

The bulk of the manual is made up of 7 Units: (1) The Fundamentals, (2) Staining Microbes, (3) Effects of the Environment on Microbial Growth, (4) Identifying Medically Significant Bacteria, (5) Applied Food and Water Microbiology, (6) Microbial Ecology, and (7) Viruses; each of these sections an umbrella for the various other important subsections. Each section provides a significant amount of relevant background information for the corresponding laboratory experiment. Unit 1: The Fundamentals is accurately titled as it covers laboratory procedures which will be utilized in each of the subsequent units (the microscope, working with and storing pure cultures, quantitative plate counts). Unit 2: Staining Microbes covers each of the familiar microbe staining topics including general staining and cell morphology, the gram stain, acid-fast stain, and endospore stain. However, this manual goes so far as to take the idea of the normal one-day staining lab and separates it into individual staining labs, making the information for each more detailed and easily digestible. Unit 3: Effects of the Environment

on Microbial Growth is one of the more expansive units (along with Unit 4). The unit covers environmental factors including: media components, bacterial enzymes, temperature, pressure, pH, oxygen, UV, disinfectants, antiseptics, and antibiotic sensitivity. It also provides techniques for calculating the minimum inhibitory concentration (MIC). Unit 4: Identifying Medically Significant Bacteria includes techniques for isolation, PCR, and identification of both known microbes (*streptococcus* spp., *enterococcus* spp., *staphylococcus* spp., *micrococcus* spp.) and unknown bacteria. It also provides elaborate detail on the *Enterobacteriaceae* family with corresponding identification techniques. Units 5, 6, and 7 though short, continue to do an adequate job of providing contextual information that is thorough and accompanying it with procedures that give students real-world laboratory experience. Unit 5: Applied Food and Water Microbiology deals with milk microbiology, water, meat, and wine microbe analysis. Unit 6: Microbial Ecology cover topics such as the Nitrogen cycle, Winogradsky columns (something that I have never encountered in my microbiology experience as an undergrad student), and antibiotic producers in soil. The final unit, Viruses, focuses primarily on understanding bacteriophages and how to type them.

Aside from providing sufficient background content and real-world lab experience, Keating begins each laboratory procedure with clearly outlined learning objectives and ends the lab with conceptual post-lab questions. Learning objectives allow students to get an idea of the key concepts and techniques they will be learning about/performing, while the post-lab questions facilitate conceptual understanding and real-world application of each procedure. What separates this manual from others I've come across is that Keating refuses to cut corners. He makes sure that the manual is an

object which can stand on its own, providing sufficient content in all areas, no matter where your instructor may lack.

LANGUAGE

It is obvious that Keating has students in mind when noting the overall clarity of the lab manual. As a 4-year science major, I still find myself getting lost in some scientific jargon. However, with this manual, I did not once experience that lost feeling. I could better understand the information and techniques presented, and I was able to reflect on them through the post-lab questions, without feeling as though the questions were set out to confuse me.

FIGURES

One of my favorite things about Keating's manual is his willingness to be racially inclusive with his figures. In lab 8: The Endospore Stain, Keating uses a visual diagram of the steps involved in the staining method. Within this figure, the individual performing the stain is shown with dark skin. In all my years of schooling I have never seen a diagram or figure with a skin tone like mine. Even with it just being a figure, it erased all doubt of my abilities as a scientist from my mind. This small bit of representation is something that should be recognized and acknowledged by all that review this work. I strongly applaud Keating for his forward and inclusive thinking. All images and figures included in the manual are clear, visually appealing, and easy to interpret/follow. The quality of many images and figures in this manual can be compared to those found in a standard textbook, something I find extremely impressive for a lab manual. Once again, Keating goes the extra mile to provide a manual that is engaging, inclusive and student-friendly.

CONCLUSION

In conclusion, Keating's manual goes above and beyond what is expected from a laboratory manual. He provides substantial information for each laboratory procedure in a way that is easy to understand and does not feel overwhelming. The organization of each laboratory is clear and structured. He also includes visual content that is stimulating and lively. He provides information about himself in the preface of the manual which sheds light on his dedication and authenticity as an author, making the manual a greater object of appreciation. I would recommend this for any microbiology professor to adopt into their curriculum.

The views expressed in this book review do not necessarily reflect the opinions of Fine Focus.