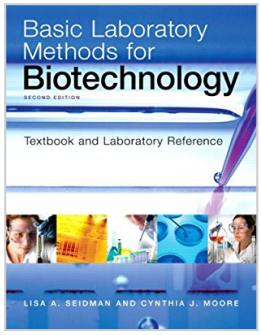

Basic Laboratory Methods for Biotechnology (2nd Edition)

By Lisa A. Seidman, Cynthia J. Moore

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Presented from the perspective of the biotech industry, this laboratory handbook/textbook reference gives a systematic, understandable, and practical introduction to fundamental laboratory methods and provides a foundation upon which students can build a career in the lab. The authors balance background and theory with practical information, drawing material from many sources: analytical chemistry texts, molecular biology manuals, industry standards, government regulations, manufacturer and supplier information, and the useful laboratory “lore” that is part of the industry’s oral tradition. <?xml:namespace prefix = st2 /> The Modern Biotechnology Industry: A Broad Overview, The Business of Biotechnology: The Transformation of Knowledge into Products, Pharmaceutical/Biopharmaceutical Products, Introduction to Product Quality Systems, Biotechnology and the Regulation of Food and Medical Products, Documentation, the Foundation of Quality, Quality Systems in the Production Facility, Quality Systems in the Laboratory, Introduction to a Safe Workplace, Working Safely in the Laboratory: General Considerations and Physical Hazards, Working Safely with Chemicals, Working Safely with Biological Materials, Basic Math Techniques, Proportional Relationships, Relationships and Graphing, Descriptions of Data (Descriptive Statistics),Introduction to Quality Laboratory Measurements, Tests and Assays, Introduction to Instrumental Methods and Electricity,The Measurement of Weight, The Measurement of Volume, The Measurement of Temperature, The Measurement of pH, Selected Ions and Conductivity, Measurements Involving Light A. Basic Principles and Instrumentation, Introduction to Quality Laboratory Tests and Assays, Measurements Involving Light B. Applications and Methods, Preparation of Laboratory Solutions A: Concentration Expressions and Calculations, Preparation of Laboratory Solutions B. Basic Procedures and Practical Information, Solutions: Associated Procedures and Information, Laboratory Solutions to Support the Activity of Biological Macromolecules, Culture Media for Intact Cells, Introduction to Filtration, Introduction to Centrifugation, Introduction to Bioseparations, Computers: An Overview, Data Handling with Computers, Applications of the Internet to Biotechnology. Itended for those interested in learning the basics of laboratory methods for biotechnology

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Editorial Review

Review
"The authors have done an outstanding job of capturing the essential skills and applied theories of mathematics, physics, biology and chemistry that are pertinent to the training needs of workers in biotechnology. The information contained in these chapters represent a wealth of basic, practical knowledge that previously was not readily available in print, but more likely was acquired 'on the job'," -- Dr. Gail Baughman, MiraCosta College "The texts we have found for our biotechnology theory course are either too deep (molecular biology) or too shall (gee whiz). It is ironic that all three of the internships I have done in biotech companies have asked for the kinds of skills found in this text, but no other text seems to be available like it. I think that the book will be a best seller." -- Bill Thieman, Ventura College "The use of many worked out examples make this test especially strong as a reference for the technician." -- David B. Shaw, Madison Area Technical College

From the Inside Flap
Preface

This is an exciting time to work in biotechnology. The Human Genome Project is generating fundamental genetic information at a breathtaking rate; basic research findings are being applied in medicine, agriculture, and the environment; and a variety of new biotechnology products are moving into production. Behind each of these accomplishments are teams of scientists and technicians whose everyday work makes such achievements possible.

For the past twelve years, we have been working with students who are beginning their careers as technicians and bench scientists in biotechnology laboratories. In order to best assist our students, we, and our colleagues elsewhere in the United States, have explored what entry level biotechnologists do at work and what abilities they need to perform this work. We have been impressed with the complexity and diversity of technical roles and responsibilities, and the importance of the skills that bench workers bring to their jobs. This book emerges partly from our experiences working with students and our explorations into the nature of the laboratory workplace*.

This book also results from our personal experiences in the laboratory. As graduate students we struggled to master the "laboratory lore" that was passed among "post-docs" and graduate students in a not always coherent chain. Some of what is in this book is the systematic introduction to laboratory lore that we wish we had received.

The result of our efforts is not a laboratory manual; this text contains few step-by-step procedures. Nor is it a book about molecular genetics, immunology, or cell culture—there are already many excellent specialized texts and manuals on these topics. This book rather is a textbook/reference manual on basic laboratory methods and the principles that underlie those methods. These basics are important to every biotechnologist, regardless of whether one is cloning DNA or purifying proteins, whether one is working in an academic setting or is employed in a company.

We intend this book to assist students preparing to become biotechnology laboratory professionals, those who already work in the laboratory, and biology students who are learning to operate effectively in the laboratory. Others who may also find this book helpful include high school teachers and their advanced

students, and industry trainers. We have endeavored to make this text accessible to beginning college students with a limited science and math background. Some sections, such as the math review in Unit III, could be skipped or skimmed by more experienced readers. At the same time as we tried to make this book practical and accessible, we also endeavored to provide enough background theory so that readers will understand the methods they use and will be prepared to solve the unavoidable problems that arise in any laboratory.

Although we focus on the biotechnology laboratory, the majority of topics we cover are of importance to individuals working in any biology laboratory. A few topics, such as quality regulations and standards, are included because they are important for those working in biotechnology companies. As biotechnology companies mature, their focus shifts from research into commercial production. As this maturation occurs, scientists and technicians often find that they must add terms like "GMP", "ISO 9000", and "quality systems" to their technical vocabulary. This book therefore weaves a conversation about regulations and standards into many chapters.

We are aware that the basic methods in this book (such as how to mix a solution or weigh a sample) are less glamorous than learning how to manipulate DNA, or how to clone a sheep. However, we also know that, in practice, the most sophisticated and remarkable accomplishments of biotechnology are possible only when the most basic laboratory work is done properly.

*The results of some of these discussions about the biotechnology workplace are summarized in the National Voluntary Skill Standards Documents in Agricultural Biotechnology and the Biosciences. (FFA, "National Voluntary Occupational Skill Standards: Agricultural Biotechnology Technician," National FFA Foundation, Madison, WI, 1994 and "Gateway to the Future, Skill Standards for the Bioscience Industry," Education Development Center, Newton, MA, Inc., 1995.)

From the Back Cover

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Kathy Natal:

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Basic Laboratory Methods for Biotechnology (2nd Edition) can be one of your beginning books that are good idea. Most of us recommend that straight away because this publication has good vocabulary which could increase your knowledge in vocab, easy to understand, bit entertaining but still delivering the

information. The article writer giving his/her effort to put every word into delight arrangement in writing Basic Laboratory Methods for Biotechnology (2nd Edition) however doesn't forget the main place, giving the reader the hottest as well as based confirm resource information that maybe you can be among it. This great information can drawn you into completely new stage of crucial contemplating.

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