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Lab Essentials



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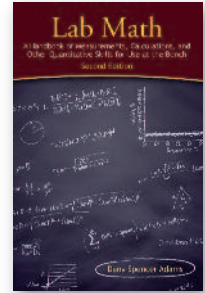
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Please visit our website for current pricing www.cshlpress.org.
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Lab Math: A Handbook of Measurements, Calculations, and Other Quantitative Skills for Use at the Bench

Second Edition

By Dany Spencer Adams, *The Tufts Center for Regenerative and Developmental Biology and Department of Biology, Tufts University*



Lab Math, Second Edition, collects in one place the numbers and equations you rely on for your experiments and use to report your data—what they mean and how to use them—as well as easy-to-follow shortcuts for making the math easier. Written in an accessible and informal style, *Lab Math* describes basic mathematical principles and various tasks involving numbers, including how to calibrate lab equipment, how to make solutions, and the numbers involved in various methods for quantifying DNA, RNA, and proteins, and an all-new section on quantitative polymerase chain reaction. Basic statistical ideas and methods and the proper reporting of uncertainty are described in simple-to-understand language. Also included are reference tables, charts and “plug-and-chug” equation blanks for specific experimental procedures. Since the publication of the first edition in 2003, *Lab Math* has become an essential math reference and teaching resource for both on-the-spot practical information and background for understanding numerical tasks. Important additions in this second edition make *Lab Math* an even more useful tool for every laboratory.

2013, 332 pp., illus., index
 Concealed wire binding \$59 £41

ISBN 978-1-936113-71-2

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1. Numbers and Measurements in the Laboratory
2. Chemistry by the Numbers
3. Equipment for Measuring, Counting, and Otherwise Quantifying
4. Making Solutions
5. DNA and RNA
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7. Statistics and Reports: Collecting, Interpreting, and Presenting Numerical Data
8. Reference Tables and Equations

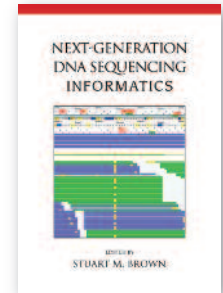
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Next-Generation DNA Sequencing Informatics

Edited by Stuart M. Brown, *New York University School of Medicine*

Next-generation DNA sequencing (NGS) technology has revolutionized biomedical research, making complete genome sequencing an affordable and frequently used tool for a wide variety of research applications. Bioinformatics methods to support DNA sequencing have become a critical bottleneck for many researchers and organizations wishing to make use of NGS technology. This book provides a thorough introduction to the necessary informatics methods and tools for operating NGS instruments and analyzing NGS data. The book also provides extensive reference to best-practice bioinformatic methods for the most commonly used NGS technologies and applications. The book also includes reference to, and guidance on, the setup and use of essential software for NGS data analysis. This is the first book of its kind to address the informatics needs of scientists who wish to take advantage of the explosion of research opportunities offered by new DNA sequencing technologies.



2013, 241 pp., illus. (48 4C & 15 B&W), index
 Hardcover \$59 £41

ISBN 978-1-936113-87-3

**Please see the Table of Contents to purchase individual chapters.
 Click on the chapter title to purchase individual chapters as PDFs.**

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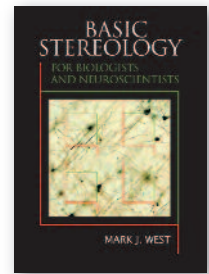


Basic Stereology for Biologists and Neuroscientists

By Mark J. West, *University of Aarhus, Denmark*

Stereological techniques allow biologists to create quantitative, three-dimensional descriptions of biological structures from two-dimensional images of tissue viewed under the microscope. For example, they can accurately estimate the size of a particular organelle, the total length of a mass of capillaries, or the number of neurons or synapses in a particular region of the brain.

This book provides a practical guide to designing and critically evaluating stereological studies of the nervous system and other tissues. It explains the basic concepts behind design-based stereology and how to get started. Also included are detailed descriptions of how to prepare tissue appropriately, perform pilot studies and decide on the appropriate sampling strategy, and account for phenomena such as tissue shrinkage. Numerous examples of applications of stereological methods that are applicable to studies of the central system and a wide variety of other tissues are explained. The book is therefore essential reading for neurobiologists and cell biologists interested in generating accurate representations of cell and tissue architecture.



2012, 206 pp., illus. (7 4C and 66 B&W), index
 Hardcover \$69 £44

ISBN: 978-1-936113-60-6

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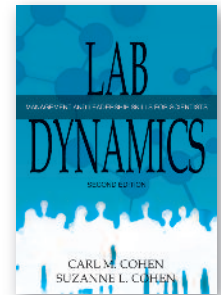


Lab Dynamics

Management and Leadership Skills for Scientists

Second Edition

By Carl M. Cohen, *Science Management Associates, Newton, Massachusetts* and
 Suzanne L. Cohen, *Science Management Associates, Newton, Massachusetts*



Lab Dynamics is a unique guide to the interpersonal side of scientific research and management. The book provides practical solutions to some of the toughest problems that working scientists and science managers face daily – problems for which most scientists are unprepared. Eleven thematically focused chapters show scientists how to communicate and interact more productively and how to develop and improve their management and leadership skills.

Every chapter from the first edition has been revised, updated and supplemented with new illustrations and graphics; many new case studies have been added to illustrate themes and techniques.

Two new chapters have been added and new sections have been added to **Chapter 3, “Gordian Knots: Solve the Toughest Problems through Negotiation”** and **Chapter 7 “Win/Win with Peers: Make Allies, Not Enemies”**, which now contains a section on Dealing with Difficult People.

2012, 280 pp., illus. index

Hardcover \$59 £41

ISBN 978-1-936113-78-1

Also available as an Amazon Kindle book.

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- 1 People Who Do Science: Who They Are and Who They Can Be
- 2 The Mote in Your Own Eye: Manage Yourself First
- 3 Gordian Knots: Solve the Toughest Problems through Negotiation
- 4 A Herd of Cats: Managing Scientists
- 5 Team Meetings: Who’s in Charge Here? **NEW!**
- 6 A Delicate Art: Manage Your Boss

- 7 Win/Win with Peers: Make Allies, Not Enemies
- 8 The Slings and Arrows of Academe: Survive to Get What You Need
- 9 Science, Inc.: Make a Smooth Transition to Industry
- 10 Leading Science: Empathy Rules **NEW!**
- 11 Shape the Future of Science and Technology
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New! Chapter 5. Team Meetings: Who’s in Charge Here? is a comprehensive guide to managing teams or groups of scientists in meetings of all types. It covers how to structure meetings for maximum productivity, how to keep meetings on track and how to manage behaviors that limit group productivity. Specific topics include:

- The unwritten rules of productive scientific team meetings
- How to structure the decision making process
- Recognizing and addressing impediments to meeting flow
- Tools to manage conflict during meetings

New! Chapter 10. Leading Science: Empathy Rules is a unique guide to leadership strategies and behaviors in a scientific setting. The chapter delves into the all important distinction between being a leader of science and a leader of people. Using case studies and examples this chapter shows how to apply the skills presented throughout the book to engage, motivate and inspire scientists. Specific topics include:

- Scientific leaders: Leaders of science or leaders of people?
- Characteristics of effective scientific leaders: Cold Spring Harbor Laboratory meets Google.
- Adaptive problem or technical problem? Miss this distinction at your peril.
- How effective are you as a leader?



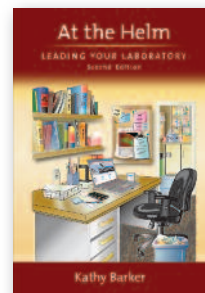
At the Helm

Leading Your Laboratory

Second Edition

By Kathy Barker, *Seattle, Washington*

Since 2002, the first edition of this best-selling book has helped thousands of newly appointed principal investigators successfully transition to running their own labs. But changes in technology continue to transform the way science is done, affecting ways in which labs communicate and collaborate, organize data and supplies, and keep current on the latest developments. The culture of science has also evolved, as more scientists explore non-academic career paths, seek new ways to communicate information and ideas, and acquire skills and knowledge outside of their field. In the second edition of this book, Kathy Barker has substantially revised the text, offering PIs advice on adapting to the changes and challenges that the years have brought. New topics include collaboration contracts, performance evaluations, communicating with non-scientists, tips for succeeding on the tenure track, and professional development. With this book as a guide, any new or aspiring PI will be well-equipped to manage personnel, time, and institutional responsibilities with confidence.



About the author: Kathy Barker received her B.A. in Biology and English, and her M.A. and Ph.D. in Microbiology, from various branches of the University of Massachusetts. She did her postdoctoral work in the laboratory of Viral Oncology at Rockefeller University and was an Assistant Professor in the Laboratory of Cell Physiology and Immunology at Rockefeller University. She is now based in Seattle, where she writes and gives workshops on various aspects of running a lab.

2010, 372 pp., illus., index

Hardcover \$61 £39

ISBN 978-0-879698-66-9

Also available as an Amazon Kindle book.

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Preface to the First Edition

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Plan the Lab You Want

Start Building Relationships

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Having It All

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B5

Career Opportunities in Biotechnology and Drug Development

By Toby Freedman, *Synopsis Search, Portola Valley, California*

As the world of biotechnology has grown in leaps and bounds, so too have the career opportunities. But the choices can be daunting. What types of jobs are available? How do you get your foot in the door? What will your job entail if you become a “Preclinical Project Manager” or a “Process Scientist”? What’s the difference between biotech and pharma?

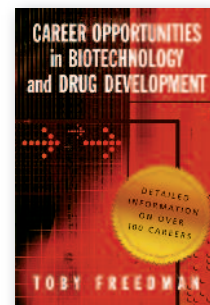
Career Opportunities in Biotechnology and Drug Development provides a comprehensive and systematic overview of careers in the life science industry, with all their ups and downs. The author, Toby Freedman, Ph.D., has conducted interviews with hundreds of key players in the industry, who provide first-hand explanations of their day-to-day roles and responsibilities, and offer key insights into how they landed those jobs in the first place. Careers in everything from discovery research to venture capital are covered in detail.

Each chapter includes valuable sections on preparing yourself for a prospective career: educational requirements and personality characteristics needed; recommendations of books, magazines, and Web site resources; and issues to consider regarding salary and compensation. The book also includes interviewing and job searching tips, as well as suggestions on writing a resume specifically for industry.

Career Opportunities in Biotechnology and Drug Development is an essential guide for science graduates and medical, business, legal, high-tech or engineering professionals. With discussions of job security, future trends, and potential career paths, even those already working in industry will find helpful information on how to take advantage of opportunities available within their own companies and elsewhere. This book will help you make wiser and more informed decisions about what role you would like to play in the biotechnology and drug development industry.

2009, 409 pp., illus., index
Paperback \$40 £25

ISBN 978-0-879698-80-5



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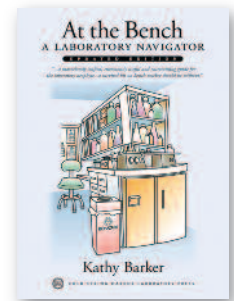
At The Bench

A Laboratory Navigator

Updated Edition

By Kathy Barker, *The Institute for Systems Biology, Seattle*

*A*t the Bench is the unique and hugely successful handbook for living and working in the laboratory, an essential aid to understanding basic lab techniques and how research groups work at a human level. In this newly revised edition, chapters have been rewritten to accommodate the impact of computer technology and the Internet, not only on the acquisition and analysis of data, but also on its organization and presentation. Alternatives to the use of radiation have been expanded, and figures and illustrations have been redrawn to reflect changes in laboratory equipment and procedures.



Barker has wisely identified many aspects of laboratory work not usually covered by ‘conventional’ manuals, making her book one of the rarest sources for vital information required for any successful scientist. Overall, the volume is superbly written, and reading is made pleasurable by multiple hilarious remarks from the author. It is highly recommended for anyone working in research—from undergraduate students to primary investigators, either in academy or industry. In my opinion, this is a ‘must have’ volume for any laboratory.

—*The Quarterly Review of Biology*

2005, 465 pp. , illus., appendices, index

Concealed wire binding \$61 £39

Also available as an Amazon Kindle book.

ISBN 978-0-879697-08-2

SECTION 1. Getting Oriented

1. General Lab Organization and Procedures
2. Laboratory Setup and Equipment
3. Getting Started and Staying Organized

SECTION 2. Plotting a Course

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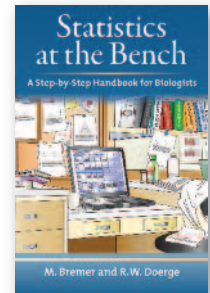
9. Working without Contamination
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Statistics at the Bench

A Step-by-Step Handbook for Biologists

By Martina Bremer, *Department of Mathematics, San Jose State University, California*, and
 Rebecca W. Doerge, *Department of Statistics and Agronomy, Purdue University, Indiana*



Statistics at the Bench is a convenient bench-side companion for biologists, designed as a handy reference guide for elementary and intermediate statistical analyses. The expectations for biologists to have a more complete understanding of statistics are growing rapidly. New technologies and new areas of science, such as microarrays, next-generation sequencing, and proteomics, have dramatically increased the need for quantitative reasoning among biologists when designing experiments and interpreting results. Even the most routine informatics tools rely on statistical assumptions and methods that need to be appreciated if the scientific results are to be correct, understood, and exploited fully.

This book is not a textbook. It is an essential handbook for working scientists. *Statistics at the Bench* provides a simple refresher for those who have forgotten what they once knew, and an overview for those wishing to use more quantitative reasoning in their research. Statistical methods, as well as guidelines for the interpretation of results, are explained using simple examples. Throughout the book, examples are accompanied by detailed Excel commands for easy reference.

2010, 167 pp., illus., indexes
 Concealed wire binding \$61 £39

ISBN 978-0-879698-57-7

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Fly Pushing

The Theory and Practice of *Drosophila* Genetics

Second Edition

By Ralph J. Greenspan, *The Neurosciences Institute, San Diego*

The second edition of this classic handbook has become a standard in the *Drosophila* field. This edition is expanded to include topics in which classical genetic strategies have been augmented with new molecular tools. Included are such new techniques as homologous recombination, RNAi, new mapping techniques, and new mosaic marking techniques.

2004, 191 pp., illus., appendices, index
Concealed wire binding \$61 £39

ISBN 978-0-879697-11-2



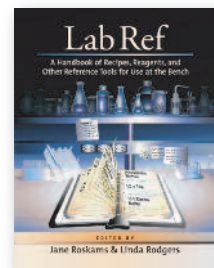
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7. Commencement



Lab Ref, Volume 1

A Handbook of Recipes, Reagents, and Other Reference Tools for Use at the Bench



Edited by Jane Roskams, *University of British Columbia, Canada*, and Linda Rodgers, *Cold Spring Harbor Laboratory*

This handbook of valuable information extracted from laboratory manuals published by Cold Spring Harbor Laboratory Press is presented in an easy-to-use format. It contains invaluable reference data, never before assembled in one handy package. It has been assembled from extensively field-tested manuals, ensuring accuracy and reliability, by two scientists with extensive and diverse experience of laboratory practice.

2002, 272 pp., illus., appendices, index
 Paperback \$25 £15

ISBN 978-1-936113-79-8

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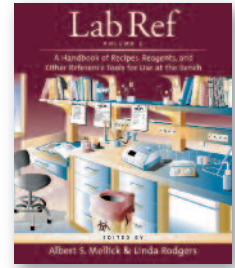
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Lab Ref: Volume 2

A Handbook of Recipes, Reagents, and Other Reference Tools for Use at the Bench



Edited by Albert S. Mellick and Linda Rodgers, *Cold Spring Harbor Laboratory*

Like its predecessor *Lab Ref, Volume 1*, this book is a handy benchtop source of recipes and information needed for common laboratory protocols. *Lab Ref, Volume 2* contains recipes for procedures as diverse as RNA interference, imaging, proteomics, and quantitative nucleic acid analysis, and is organized by application for quick and easy reference. All recipes were derived from recent manuals published by Cold Spring Harbor Laboratory Press, and each recipe is cross-referenced to its manual of origin. Reference tables and charts are included. To meet the growing need for computational resources in the biology laboratory, *Lab Ref, Volume 2* also has an expanded Web site section with sources for biological materials, databases for acquiring and annotating genomic and proteomic data, and links to downloadable software.

2007, 248 pp., illus., appendix, index
 Concealed wire binding \$40 £25

ISBN 978-0-879698-15-7

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B. Nomenclature Guide

C. Useful World Wide Web Sites

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Experimental Design for Biologists

By David J. Glass, M.D., *Novartis Institutes for Biomedical Research*

The effective design of scientific experiments is critical to success, yet graduate students receive very little formal training in how to do it. Based on a well-received course taught by the author, *Experimental Design for Biologists* fills this gap.

Experimental Design for Biologists explains how to establish the framework for an experimental project, how to set up a system, design experiments within that system, and how to determine and use the correct set of controls. Separate chapters are devoted to negative controls, positive controls, and other categories of controls that are perhaps less recognized, such as “assumption controls,” and “experimentalist controls.” Furthermore, there are sections on establishing the experimental system, which include performing critical “system controls.”

Should all experimental plans be hypothesis-driven? Is a question/answer approach more appropriate? What was the hypothesis behind the Human Genome Project? What color is the sky? How does one get to Carnegie Hall? The answers to these kinds of questions can be found in *Experimental Design for Biologists*. Written in an engaging manner, the book provides compelling lessons in framing an experimental question, establishing a validated system to answer the question, and deriving verifiable models from experimental data. *Experimental Design for Biologists* is an essential source of theory and practical guidance in designing a research plan.



2007, 206 pp., illus., index

Hardcover \$37 £23

ISBN 978-0-879697-35-8

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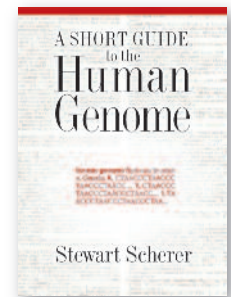
A Short Guide to the Human Genome

By Stewart Scherer

How many genes are in the human genome? Which genes are commonly associated with genetic diseases? How many mobile elements, simple sequence repeats, or protein kinases are encoded in the genome? What are the largest genes and proteins? How similar are human proteins to those of mouse, yeast, or bacteria?

Although the human genome has been sequenced, it often can be surprisingly difficult to find answers to seemingly simple questions about its characteristics. This convenient handbook, written in question-and-answer format, allows researchers and teachers alike access to basic facts about the human genome.

Using a recent assembly of the human genome sequence, Stewart Scherer has compiled answers to a broad range of questions about the structure and function of the human genome. Answers to each question are presented in a direct, straightforward style. Numerous figures and tables are included to illustrate and summarize the information.



2008, 173 pp., illus., index
Paperback \$29 £18

ISBN 978-0-879697-91-4

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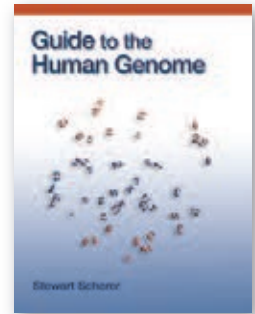
Human Gene Index



Guide to the Human Genome

By Stewart Scherer

Presenting the genes of the human genome in their biological context, *Guide to the Human Genome* is an extensive online resource that provides easy access to information about human genes and their roles in specific processes. The website text is also available in a print version. With numerous illustrations and tables, each of the nearly 300 sections of the *Guide* describes genes involved in a specific pathway, process, or structure—from the molecular and cellular levels to developmental and physiological processes. In the online version, these sections contain links to more information about proteins encoded by over 17,000 known or predicted human genes. For each protein, basic characteristics about its composition and length, its human relatives and relatedness to proteins in other species, and direct links to resources at NCBI are included. Additional links to NCBI resources are provided for human noncoding RNAs and repeated DNA elements and for proteins of interest from other species. The entire text of the *Guide* is searchable, and tools are available for identifying human protein sequences using those from other species. The *Guide* will be useful to researchers looking to connect sequence data with functional information, and can be used in parallel with traditional texts in undergraduate and graduate courses to provide a genomics dimension and experience of identifying genes underpinning processes of interest.



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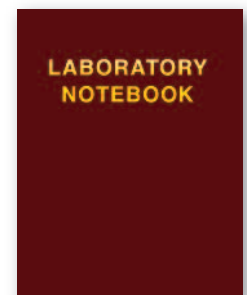
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