TABLE OF CONTENTS

CONTRIBUTORS ix

PREFACE xi

1. A SCIENTIST GONE BAD: HOW I WENT FROM THE BENCH TO THE BOARDROOM 1
   Cynthia Robbins-Roth

SCIENCE AND INFORMATION 15

2. TECHNICAL WRITING: MAKING SENSE OUT OF MANUALS 15
   Clayton R. Randall (second edition updated by Cynthia Robbins-Roth)

3. SCIENCE WRITING: COMMUNICATING WITH THE MASSES 27
   Sue Goetinck Ambrose
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Creating a Publishing Empire: How I Gave Up Academia and Became an Entrepreneurial Editor</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Roger Longman</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Business Information Services: Providing the Data for Industry</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Mark D. Dibner</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>The Financial World</strong></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Becoming a Venture Capitalist</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Deepa Pakianathan</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Investment Banking: Dreams and Reality</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Peter Drake (second edition updated by Cynthia Robbins-Roth)</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>How I Became an Analyst: Science-Based Investment Advising</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Mary Ann Gray</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>The Corporate World</strong></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Entrepreneur and Company Founder: Starting Your Own Company and Surviving</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Ron Cohen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ronald Pepin</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>The Growth of a Manager: From Pure Research to Policy Administration</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>Philip W. Hammer</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Regulatory Affairs: Keeping Product Development on Track</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>Elizabeth D. Moyer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alexandra J. Baran</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Entering Biomedical and Scientific Consulting</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>Robert Roth</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Sales and Marketing: So You Want to Sell?</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>Erin Hall Meade</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>From Doing Research to Moving Research: My Life in Tech Transfer</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>Paula Szoka</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Corporate Communications: Helping Companies Sell Their Stories</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Tony Russo</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Executive Search: The Hunt for Exceptional Talent</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>Bente Hansen</td>
<td></td>
</tr>
</tbody>
</table>
19. **Consultant to the Stars: Advising CEOs for Fun and Profit**  
Carol Hall  

20. **Biomedical Consultant: Specializing in Technology Assessment, Strategic Planning, and Grant Writing**  
Gail Schechter  

**Science Careers in Government**  

21. **Science and Public Policy: Translating Between Two Worlds**  
David Applegate  

Gina Lento  

23. **Government Agencies: Directing Science in the Military**  
Genevieve Haddad  

**Appendix: Information Resources About Alternative Careers for Scientists**  
Cynthia Robbins-Roth  

**Index**  

---  

**Contributors**

*Numbers in parenthesis indicate the pages on which the author's contributions begin.*

David Applegate (245), U.S. Geological Survey, Reston, Virginia 20192

Alexandra J. Barak (139), A.J. Baran Consulting Inc., Palo Alto, California 94025

Ron Cohen (97), Acorda Therapeutics, New York, New York 10532

Mark D. Dibner (47), BioAbility, Research Triangle Park, North Carolina 27709

Peter Drake (71), Mayflower Partners, Chicago, Illinois 60610

Sue Goetinck Ambrose (27), The Dallas Morning News, Dallas, Texas 75214

Mary Ann Gray (79), Gray Strategic Advisors, New York, New York 10023


Carol Hall (217), BioVenture Consultants, Chestnut Hill, Massachusetts 02467

Philip W. Hammer (117), The Franklin Center, The Franklin Institute Science Museum, Philadelphia, Pennsylvania 19103

Bente Hansen (205), Bente Hansen & Associates, San Diego, California 92130
Nontraditional Careers for Chemists

New Formulas in Chemistry

Lisa M. Balbes
Contents

List of Profiles  xi

Introduction  3

1  Chemistry and Communications  7

2  Chemistry and Information Science  37

3  Chemistry and Patents  65

4  Chemistry and Sales and Marketing  85

5  Chemistry and Business Development  117

6  Chemistry and Regulatory Affairs  147

7  Chemistry and Public Policy  171

8  Chemistry and Safety  187

9  Chemistry and People  213

10 Chemistry and Computers  229

11 Chemistry and Education  247

12 Chemistry and Everything Else  273

Conclusions  289

Index  295
What's Past is PROLOGUE

The Personal Stories of Women in Science at the Vanderbilt University School of Medicine

Edited by Eric G. Neilson, MD
Contents

Foreword ................................................................. xiii
Steven G. Gabbe, MD
Dean, School of Medicine, Vanderbilt University

Preface ................................................................. xv
Eric G. Neilson, MD
Hugh Jackson Morgan Professor of Medicine
Professor of Cell and Developmental Biology
Chair, Department of Medicine
Vanderbilt University School of Medicine

Chapters
1. Nancy J. Brown, MD ................................................. 3
Robert H. Williams Professor of Medicine and Pharmacology
Division of Clinical Pharmacology
Department of Medicine
Director, Vanderbilt Clinical Research Scholars Program
Member, American Society for Clinical Investigation

2. Tina V. Hartert, MD, MPH ......................................... 9
Assistant Professor of Medicine
Division of Allergy, Pulmonary, and Critical Care Medicine
Department of Medicine

3. Lee E. Limbird, PhD ............................................... 17
Former Chair, Department of Pharmacology, Vanderbilt University
Former Associate Vice-Chancellor for Research, Vanderbilt University
Vice President for Research, Meharry Medical College
Chair, Department of Biomedical Sciences, Meharry Medical College

4. Marie R. Griffin, MD, MPH ...................................... 29
Professor of Preventive Medicine and Medicine
Department of Preventive Medicine
5. Wonder P. Drake, MD .................................................. 33
   Assistant Professor of Medicine
   Division of Infectious Diseases
   Department of Medicine

6. Susan R. Wente, PhD .................................................. 37
   Professor of Cell and Developmental Biology
   Associate Director, Medical Scientist Training Program (MSTP)
   Chair, Department of Cell and Developmental Biology

7. Mary Zutter, MD ...................................................... 45
   Ingram Professor of Cancer Research and Pathology
   Department of Pathology
   Program Director, Host-Tumor Interactions, Vanderbilt-Ingram Cancer Center
   Director, Hematopathology

8. Kathryn M. Edwards, MD ............................................. 49
   Vice Chair and Professor of Pediatrics
   Division of Pediatric Infectious Diseases
   Department of Pediatrics
   Associate Program Director, General Clinical Research Center

9. Julia B. Lewis, MD ...................................................... 53
   Professor of Medicine
   Division of Nephrology and Hypertension
   Department of Medicine
   Program Director, Nephrology Subspecialty Fellowship

10. Ellen Wright Clayton, MD, JD ................................. 57
    Rosalind E. Franklin Professor of Pediatrics and Law
    Department of Pediatrics
    Director, Center for Genetics and Health Policy

11. Elaine Sanders-Bush, PhD ......................................... 63
    Professor of Pharmacology and Psychiatry
    Department of Pharmacology
    Director, Brain Institute

12. Lorraine B. Ware, MD ............................................. 69
    Assistant Professor of Medicine
    Division of Allergy, Pulmonary, and Critical Care Medicine
    Department of Medicine

13. Jennifer A. Pietenpol, PhD ...................................... 75
    Ingram Professor of Cancer Research and Biochemistry
    Department of Biochemistry
    Associate Director of Basic Science Programs,
    Vanderbilt-Ingram Cancer Center

14. Judy L. Aschner, MD ................................................ 85
    Professor of Pediatrics
    Director, Division of Neonatology
    Department of Pediatrics

15. Jin Chen, MD, PhD .................................................. 95
    Associate Professor of Medicine, Cancer Biology, and
    Cell and Developmental Biology
    Division of Rheumatology and Immunology
    Department of Medicine

16. Mildred T. Stahlman, MD ....................................... 101
    Professor of Pediatrics
    Former Director, Division of Neonatology
    Department of Pediatrics
    Member, Institute of Medicine of the National Academies

17. Lynn McCormick Matrisian, PhD ............................. 109
    Ingram Professor of Cancer Research and Cancer Biology
    Chair, Department of Cancer Biology

18. J. Ann Richmond, PhD .......................................... 113
    Professor of Cancer Biology, Cell Biology, and Medicine
    Vice Chair, Department of Cancer Biology
    Assistant Dean for Biomedical Research, Education, and Training
19. Kathleen L. Gould, PhD ............................... 119
   Professor of Cell and Developmental Biology
   Department of Cell and Developmental Biology
   Investigator, Howard Hughes Medical Institute

20. Geraldine G. Miller, MD ............................... 127
   Professor of Medicine and Microbiology and Immunology
   Division of Infectious Diseases
   Department of Medicine

21. Julie A. Bastarache, MD ............................... 131
   Instructor of Medicine
   Division of Allergy, Pulmonary, and Critical Care Medicine
   Department of Medicine

22. Heidi E. Hamm, PhD ............................... 137
   Earl W. Sutherland Jr. Professor of Pharmacology
   Chair, Department of Pharmacology

23. Neeraja B. Peterson, MD, MSc ............................... 145
   Assistant Professor of Medicine
   Division of General Internal Medicine and Public Health
   Department of Medicine

24. Xiao-ou Shu, MD, MPH, PhD ............................... 151
   Professor of Medicine and Pediatrics
   Division of General Internal Medicine and Public Health
   Department of Medicine

25. Katherine T. Murray, MD ............................... 157
   Associate Professor of Medicine and Pharmacology
   Division of Clinical Pharmacology
   Department of Medicine

26. Agnes B. Fogo, MD ............................... 161
   Professor of Pathology, Medicine, and Pediatrics
   Department of Pathology
   Director, Division of Renal and Electron Microscopy

27. Louise A. Mawn, MD ............................... 167
   Assistant Professor of Ophthalmology
   Division of Oculoplastic and Reconstructive Surgery
   Department of Ophthalmology and Visual Sciences

Epilogue ........................................... 173
Eric G. Neilson, MD
At the Bench
A LABORATORY NAVIGATOR
UPDATED EDITION

"...a marvelously crafted, enormously useful and entertaining guide for the laboratory neophyte...a survival kit no bench worker should be without."

Kathy Barker

COLD SPRING HARBOR LABORATORY PRESS
Contents

Preface ix
Abbreviations xi

SECTION 1. Getting Oriented

Chapter 1. General Lab Organization and Procedures 3
   The Big Picture 4
   Laboratory Personnel 5
   Lab Routines 7
   What to Expect the First Week 10
   What to Do the First Week 12
   What Not to Do the First Week 12
   Survival Through Common Sense and Courtesy 14
   Nonnegotiable Safety Rules 17
   Resources 19

Chapter 2. Laboratory Setup and Equipment 21
   Lay of the Land 22
   Using the Equipment 37
   How to Buy New Equipment 39
   Resources 41

Chapter 3. Getting Started and Staying Organized 43
   Setting Up a Functional Lab Bench 44
   Setting Up a Command Center 57
   Resources 66

SECTION 2. Plotting a Course

Chapter 4. How To Set Up an Experiment 69
   Philosophical Considerations 69
   Planning an Experiment 71
   Interpreting Results 83
   Resources 87
Contents

Chapter 5. Laboratory Notebooks
   Type and Format 89
   Content 89
   Maintenance 92
   Ethics 93
   Resources 97

Chapter 6. Presenting Yourself and Your Data
   Communication Tips 101
   Oral Presentations 101
   Written Presentations 110
   Resources 121
   126

SECTION 3. Navigating

Chapter 7. Making Reagents and Buffers
   Determining What You Need 131
   Calculating What You Need 132
   Weighing and Mixing 139
   Measuring pH 149
   Sterilizing Solutions 153
   Storing Buffers and Solutions 158
   Resources 162
   163

Chapter 8. Storage and Disposal
   Emergency Storage 165
   Storing Reagents 165
   Aliquoting 167
   Refrigerators and Freezers 172
   Discarding Lab Waste 174
   Resources 177
   185

Chapter 9. Working without Contamination
   When to Use Sterile Technique 187
   Sterile Technique 188
   Protecting the Investigator 199
   Sterile Technique in the Class II Biosafety Cabinet 200
   Resources 205

Chapter 10. Eukaryotic Cell Culture
   Types of Cultures and Cell Lines 207
   Observing Cells 211
   Obtaining Cells 213
   Cell Maintenance 217
<table>
<thead>
<tr>
<th>Contents</th>
<th>vii</th>
</tr>
</thead>
</table>

Freezing and Storage of Cells 230
Contamination 233
CO₂ Incubators and Tanks 238
Resources 245

**Chapter 11. Bacteria** 247
Setting Up 247
Working Rules 249
Obtaining Bacteria 250
Growth and Maintenance 251
Antibiotics 256
Reviving Cultures 258
Obtaining Isolated Colonies 260
Counting Bacteria 265
Storage 274
Freezing Bacteria 275
Contamination 276
Resources 277

**Chapter 12. DNA, RNA, and Protein** 279
Molecular Biology Tips 279
DNA 280
Introducing DNA into Cells and Microorganisms 294
RNA 296
Protein 299
Resources 310

**Chapter 13. Radioactivity** 313
Properties of Radioactive Elements 314
How to Obtain Radioisotopes 315
Doing Radioactive Experiments 320
Experimental Detection of Radiation 329
Storage 338
Disposal 339
Alternatives to Radioactivity 342
Resources 345

**Chapter 14. Centrifugation** 347
Background 347
Working Rules 355
How to Spin 357
Gradients 369
Centrifuge and Rotor Maintenance 371
Resources 373
Contents

Chapter 15. Electrophoresis
   Basic Rules  375
   Generalities  375
   Specifics  376
   Transferring Gel Contents to Membranes  382
   Resources  399

Chapter 16. Microscopy
   Background  405
   Using the Light Microscope  411
   Slides and Stains  419
   Photography  422
   Fluorescence Microscopy  427
   Shared Instrument Facilities  430
   Resources  431

Glossary  433

Index  455
MANAGEMENT SKILLS FOR SCIENTISTS

CARL M. COHEN
SUZANNE L. COHEN
# Table of Contents

Introduction, ix

1 People Who Do Science: Who They Are and Who They Can Be, 1

2 The Mote in Your Own Eye: Manage Yourself First, 17

3 Gordian Knots: Solve the Toughest Problems through Negotiation, 33

4 A Herd of Cats: Managing Scientists, 55

5 A Delicate Art: Manage Your Boss, 79

6 Win/Win with Peers: Make Allies, Not Enemies, 95

7 The Slings and Arrows of Academe: Survive to Get What You Need, 113

8 Science, Inc.: Make a Smooth Transition to Industry, 129

9 Shape the Future of Science and Technology, 149

Appendix: Resources, 169

Index, 173

About the Authors, 177
Making the Right Moves
A Practical Guide to Scientific Management for Postdocs and New Faculty

Burroughs Wellcome Fund
Howard Hughes Medical Institute

Second Edition
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>vii</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>ix</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td><strong>Chapter 1</strong> Obtaining and Negotiating a Faculty Position</td>
<td>5</td>
</tr>
<tr>
<td>The Job Search</td>
<td>5</td>
</tr>
<tr>
<td>The Job Application</td>
<td>8</td>
</tr>
<tr>
<td>The Job Interview</td>
<td>11</td>
</tr>
<tr>
<td>Negotiating Your Position</td>
<td>16</td>
</tr>
<tr>
<td>Resources</td>
<td>24</td>
</tr>
<tr>
<td><strong>Chapter 2</strong> Understanding University Structure and Planning for Tenure</td>
<td>25</td>
</tr>
<tr>
<td>Organization of a “Typical” University</td>
<td>26</td>
</tr>
<tr>
<td>Organization of a “Typical” Academic Health Center</td>
<td>28</td>
</tr>
<tr>
<td>People You Should Get to Know</td>
<td>29</td>
</tr>
<tr>
<td>Faculty Governing Bodies and Committees</td>
<td>30</td>
</tr>
<tr>
<td>Support Facilities and Services</td>
<td>31</td>
</tr>
<tr>
<td>Responsibilities Beyond the Laboratory</td>
<td>35</td>
</tr>
<tr>
<td>The Scientific Investigator and the Outside World</td>
<td>37</td>
</tr>
<tr>
<td>Planning for Promotion and Tenure</td>
<td>38</td>
</tr>
<tr>
<td>Resources</td>
<td>46</td>
</tr>
<tr>
<td><strong>Chapter 3</strong> Laboratory Leadership in Science</td>
<td>49</td>
</tr>
<tr>
<td>Your Role as a Laboratory Leader</td>
<td>50</td>
</tr>
<tr>
<td>Creating Your Vision as a Leader</td>
<td>53</td>
</tr>
<tr>
<td>Developing Your Leadership Style</td>
<td>55</td>
</tr>
<tr>
<td>Building and Sustaining an Effective Team</td>
<td>57</td>
</tr>
<tr>
<td>Resources</td>
<td>72</td>
</tr>
<tr>
<td>Appendix 1: The Four Preferences That Make Up Your Personality Type</td>
<td>73</td>
</tr>
<tr>
<td>Appendix 2: Performance Review Form</td>
<td>75</td>
</tr>
<tr>
<td>Appendix 3: Performance Feedback Checklist for Managers</td>
<td>76</td>
</tr>
<tr>
<td><strong>Chapter 4</strong> Staffing Your Laboratory</td>
<td>77</td>
</tr>
<tr>
<td>Getting Started</td>
<td>77</td>
</tr>
<tr>
<td>Recruiting Applicants</td>
<td>79</td>
</tr>
<tr>
<td>Screening Applicants</td>
<td>81</td>
</tr>
<tr>
<td>Interviewing Applicants</td>
<td>83</td>
</tr>
<tr>
<td>Evaluating Applicants</td>
<td>89</td>
</tr>
<tr>
<td>Making the Offer</td>
<td>91</td>
</tr>
<tr>
<td>Asking Staff to Leave</td>
<td>91</td>
</tr>
<tr>
<td>Resources</td>
<td>95</td>
</tr>
<tr>
<td>Appendix: Telephone Interview Outline</td>
<td>96</td>
</tr>
</tbody>
</table>
Chapter 5 ◆ Mentoring and Being Mentored
  What is Mentoring? 97
  A Mentor’s Responsibilities 98
  Strategies for Effective Mentoring in Your Lab 100
  Different Mentoring Needs 103
  Mentoring Individuals Outside Your Lab 105
  How to Get the Mentoring You Need 106
  Gender and Culture Issues 108
  Resources 110

Chapter 6 ◆ Time Management
  Strategies for Planning Your Activities 113
  Managing Your Time Day to Day 115
  Special Issues 120
  Resources 123

Chapter 7 ◆ Project Management
  What Is Project Management? 125
  Getting Started 127
  Tracking the Work and the Resources 131
  Project Management Software 132
  Controlling the Project 134
  Resources 135
  Appendix: Project Management—A Real-Life Example 137

Chapter 8 ◆ Data Management and Laboratory Notebooks
  Day-to-Day Record Keeping: The Lab Notebook 143
  Tracking and Storing Information 147
  Finding the Right Data Management System for You 150
  Resources 152

Chapter 9 ◆ Getting Funded
  Understanding the NIH Funding Process 154
  Preparing a Strong Grant Application 161
  A Bit About Budgets 168
  Submitting Your Application 170
  The National Science Foundation 172
  Resources 173

Chapter 10 ◆ Getting Published and Increasing Your Visibility
  A Brief Overview of Scientific Publishing 175
  Planning for Publication 177
  Getting Your Paper Published 179
  Increasing Your Visibility 183
  Resources 185
Chapter 11  Understanding Technology Transfer  187
  University Technology Transfer Offices  187
  The Technology Transfer Process  188
  The Legal Terms and Agreements  189
  Sponsorship and Consultation  196
  Conflicts of Commitment and Interest  198
  Resources  199

Chapter 12  Setting Up Collaborations  201
  The Varieties of Collaboration  201
  Should You Collaborate?  202
  Setting Up a Collaboration  203
  The Ingredients of a Successful Collaboration  205
  Special Challenges for the Beginning Investigator  207
  International Collaborations  208
  When a Collaboration is Not Working  209
  Resources  210

Chapter 13  Teaching and Course Design  211
  Why Teach Well  211
  Becoming an Effective Teacher  212
  Planning to Teach a Course  215
  The Principles of Active Learning  215
  Active Learning at a Medical School  221
  Assessing Student Learning  223
  Course Design  226
  Teaching Others to Teach  231
  Professional Considerations  234
  Resources  236
  Appendix 1: Examples of Active Assessments for Large Lectures  242
  Appendix 2: Bloom's Taxonomy  245

Index  247
At the Helm

LEADING YOUR LABORATORY
Second Edition

Kathy Barker
Contents

Preface, vii
Preface to the First Edition, ix
Acknowledgments, xi

KNOW WHAT YOU WANT, 1
The Lab Where Everyone Wants to Be 3
Start in the Right Place 7
Plan the Lab You Want 19
Start Building Relationships 29
Resources 31

YOU AS A LEADER, 33
I Was Trained to Do Everything but Run a Lab! 35
Stop Putting Out Fires! 43
Using Your Time 57
Working with an Administrative Assistant 65
Be Proactive in Finding a Mentor 73
Resources 79

CHOOSE YOUR PEOPLE, 81
Choose Your People 83
The Hiring Process 91
The Effective Interview 99
Evaluating Candidates 113
Resources 123

STARTING AND KEEPING NEW LAB MEMBERS, 125
Getting Off to a Good Start 127
Training Lab Personnel 133
Mentor to All? 143
Resources 151
vi / Contents

MAKE RESEARCH THE FOUNDATION, 153
  Setting the Course 155
  Motivation 167
  Writing Papers 181
  Resources 193

ORGANIZING THE LAB TO SUPPORT THE RESEARCH, 195
  Building a Lab Culture 197
  Lab Policies 203
  Meetings and Seminars 217
  Using Computers to Organize the Lab 231
  Resources 245

COMMUNICATION AS THE GLUE, 247
  Communication with Your Lab 249
  The Pleasures and Perils of Diversity 259
  Gender Is Still an Issue 271
  Learning through Conflict 275
  Stress and Depression in Lab Members 281
  Resources 289

DEALING WITH A GROUP, 293
  Lab Morale 295
  Lab Romances 301
  Maintaining Personnel Equilibrium 309
  "I Should Have Done It Sooner!" 315
  Violence in the Workplace 321
  Resources 327

FOR THE LONG RUN, 329
  As Your Job Changes... 331
  Maintaining Enthusiasm 341
  Career Choices 349
  Having it All 353
  Resources 359

Index, 363
# Table of Contents

1. ACADEMIC CAREERS  
   - Succeeding in Science at a Liberal Arts College  
   - How to Ask Your Chair for a Raise  
   - Sustaining Women through Critical Career Transitions  
   - Late Career Opportunities and Challenges for Cell Biologists  

2. ALTERNATIVE SCIENCE CAREERS  
   - From Lab to Law  
   - Science through Words  
   - Science Libraries Want You!  
   - Exploring a Career at the NIH Center for Scientific Review  

3. THE HEAD GAME  
   - Strategies for the Shy  
   - Becoming Visible: Effective Self-Promotion  

4. COMMUNICATION  
   - How to Write an Effective Letter of Recommendation  
   - How to Read a Letter of Recommendation  
   - Delivering an Effective Scientific Lecture  
   - Email Etiquette  

5. SCIENTIFIC CITIZENSHIP  
   - Approaching the Critical Task
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revising Your NIH Grant Application</td>
<td>63</td>
</tr>
<tr>
<td><strong>6. GRADUATE AND POSTDOC ISSUES</strong></td>
<td>67</td>
</tr>
<tr>
<td>Advice on Choosing a Successful Postdoctoral Position</td>
<td>68</td>
</tr>
<tr>
<td>How to Apply for a Postdoctoral Position</td>
<td>71</td>
</tr>
<tr>
<td>How to Have a Successful Postdoc Experience and Get a Good Job</td>
<td>74</td>
</tr>
<tr>
<td>Your Career Plan ...</td>
<td></td>
</tr>
<tr>
<td>Consider the Forest While You’re Focused on the Trees</td>
<td>78</td>
</tr>
<tr>
<td>Their Future in Your Hands: Inspiring Undergrads to Pursue Ph.D.s</td>
<td>81</td>
</tr>
<tr>
<td><strong>7. UNDERREPRESENTED MINORITY ISSUES.</strong></td>
<td>85</td>
</tr>
<tr>
<td>Diversity in Science:</td>
<td></td>
</tr>
<tr>
<td>The Importance of Mentoring</td>
<td>86</td>
</tr>
<tr>
<td>Self-Awareness and Cultural Identity:</td>
<td></td>
</tr>
<tr>
<td>A Medical School Course of Exploration into Personal Unconscious Bias.</td>
<td>90</td>
</tr>
<tr>
<td><strong>8. WOMEN IN SCIENCE</strong></td>
<td>95</td>
</tr>
<tr>
<td>A Network of Our Own</td>
<td>96</td>
</tr>
<tr>
<td>Improving the Climate for Women in Academia.</td>
<td>99</td>
</tr>
<tr>
<td>The Wisdom of Athena:</td>
<td></td>
</tr>
<tr>
<td>A Model Scheme for Achieving Gender Equity in Science and Engineering in the UK</td>
<td>103</td>
</tr>
<tr>
<td><strong>9. CAREER AND FAMILY</strong></td>
<td>107</td>
</tr>
<tr>
<td>Dual-Career Academic Couples</td>
<td>108</td>
</tr>
<tr>
<td>Postponement of Parenthood—the Good, the Bad, and the Ugly</td>
<td>111</td>
</tr>
<tr>
<td>Postponement of Parenthood: Implications for Women Scientists</td>
<td>115</td>
</tr>
<tr>
<td>On Supporting Female Postdoctoral Fellows with Children.</td>
<td>118</td>
</tr>
</tbody>
</table>
JOHN FETZER

Career Management for Chemists

A Guide to Success in a Chemistry Career

Springer
Contents

Acknowledgements  XI

1  Introduction – The Career as a Long Trip  1

2  Technical Areas  11

2.1  Accepting Failure to Create Innovation in Experimentation  13

2.2  Keeping Current – Always Learning  20

2.3  Specialist or Generalist?  26

2.4  Being a Part of the Scientific Community  32

2.4.1  General Remarks  32

2.4.2  Societies – Is it Advantageous to Belong to Professional Societies?  33

2.4.3  Being Involved in Societies  34

2.4.4  Conferences – Is it Advantageous to Attend and Present at Conferences?  35

2.4.5  Journals and other Publications – Is it Advantageous to Publish Papers?  38

2.4.6  Reviewing for Journals  40

2.4.7  Advisory Boards and Editorships  41

2.5  Thinking – Curiosity and Wonder  43

2.6  Thinking – Skepticism  48

2.7  Diversifying  53

2.8  Parochial Science – Possessiveness and Boundaries  60
Non-technical Areas 87

3.1 Communicating 89
  3.1.1 The General Common Points 89
  3.1.2 Eloquence – Speaking Easily the First Time 92
  3.1.3 Writing a Paper – The Basic Mechanics Help 99
  3.1.4 Writing with Style 111
  3.1.5 Listening 117

3.2 Networking – Becoming an Integral Part of Your Field 121

3.3 Collaborative Research 129

3.4 Diversity in Science – Being Open-Minded 138

3.5 Using a Mentor 142

3.6 Being a Mentor 147

3.7 Behaviors 154
  3.7.1 Personalities and Styles in Dealing with Others 154
  3.7.2 Dealing with Those on the Dark Side – Difficult and Worse People 159
  3.7.3 Ethics – The Right Things To Do 170

3.8 Teams, Teamwork, and Leadership 175

3.9 Balancing Professional and Private Time 187

4 Career Changes 191

4.1 The Rewards of Working in Industry – Starting and Choosing a Direction from Graduate School to an Industrial Career 193

4.2 Industry Versus Academia – The Merits of an Industrial Career in Contrast to One in Academia 197

4.3 Resume and Curriculum Vitae – Getting the Message Across 202

4.4 The Grass is Greener – A Comparison Between Workplaces 210

4.5 Changing Hats – Supervising and Managing 223

4.6 Personal Skills and Assessments 234

4.7 Degree of Difficulty – Non-advanced Degree Chemists 242

4.8 Pursuit of Non-traditional Careers in Chemistry – Chemists Without Lab Coats 248

5 Bibliography 261
CAREER OPPORTUNITIES in BIOTECHNOLOGY and DRUG DEVELOPMENT

DETAILED INFORMATION ON OVER 100 CAREERS

TOBY FREEDMAN
Contents

Preface, vii
Acknowledgments, ix

PART I. INDUSTRY OVERVIEW: LANDING A JOB IN INDUSTRY

1. The Pros and Cons of Working in Industry: Why Make the Transition?, 1
3. So You Want a Job in Biotechnology and Drug Development...: Finding Your Way In, 15
4. The Biotechnology Industry Resume: Putting Your Best Foot Forward, 25
5. The Informational Interview: Researching Your Options, 33
6. The Biotechnology and Drug Development Industry: An Overview, 39

PART II. CAREER OPPORTUNITIES IN BIOTECHNOLOGY AND DRUG DEVELOPMENT COMPANIES

7. Discovery Research: The Idea Makers, 47
8. Preclinical Research: The Bridge between Discovery Research and Clinical Development, 67
10. Clinical Development: Developing New Products to Benefit Human Health, 91
11. Medical Affairs: Working in the Post-Approval World, 125
12. Regulatory Affairs: The Final Challenge—Passing the FDA Test, 137
13. Quality: Consistently Making Good Products, 157
14. Operations: Ensuring that Processes Run Smoothly and Efficiently, 175
15. Bio/Pharmaceutical Product Development: The Chemistry Has to Be Good, 191
16. Life Science Information Management: The Melding of Computer and Biological Sciences, 207
18. Marketing: Communicating a Message to Customers, 243
19. Sales: Generating Revenue and Educating Customers, 263
20. Technical Applications and Support: Getting Paid to Be the Expert, 279
21. Corporate Communications: Communication between External and Internal Worlds, 293
22. Executive Leadership and Entrepreneurship: The Business Builders, 311
23. Law: Providing Legal Advice and Protecting Property, 329
24. Health Care Finance: Venture Capital, Institutional Investing, Investment Banking, and Equity Research, 347
25. Management Consulting: The Strategy Advisors, 377
26. Recruiting: The Business of Matchmaking, 387

Index, 401
Career Opportunities in Clinical Drug Research

REBECCA J. ANDERSON

Clinical Quality Assessment Auditor
CLINICAL RESEARCH ASSOCIATE
Regulatory Affairs Specialist
Clinical Quality Assessment Auditor
Medical Writer
Clinical Data Manager
Biostatistician
Medical Clinical Safety Specialist
Clinical Quality Assessment Auditor
Contents

Preface, ix
Abbreviations and Acronyms, xiii

PART 1: BACKGROUND
1 What Is the Clinical Environment in Industry?, 1
2 How Are Drugs and Medical Devices Developed?, 21
3 What Happens at the Clinical Site?, 43

PART 2: PATHS TO CLINICAL JOBS IN THE MEDICAL PRODUCTS INDUSTRY
4 Entering as a Clinical Research Associate, 65
5 Entering Data Management, 89
6 Entering as a Biostatistician, 113
7 Entering as a Clinical Quality Assurance Auditor, 135
8 Entering Regulatory Affairs, 157
9 Entering Clinical Safety, 179
10 Entering as a Medical Writer, 199
11 Your Future in Clinical Operations, 219

PART 3: TOOL BOX
12 Helpful Hints for Landing a Clinical Product Development Job, 233
13 Reference Materials, 255

Glossary, 265
Index, 273
About the Author, 279
Contents

Preface v

About the Author viii

INTRODUCTION How and Why Biologists Write: An Introduction to Biological Literature 1

CHAPTER 1 Locating and Using Biological Literature 5
  SEARCHING THE LITERATURE 5
  SAMPLE DATABASE SEARCH 11
  USING THE INTERNET 20
  READING SCIENTIFIC PAPERS 27
  TAKING NOTES 29

CHAPTER 2 Handling Data and Using Statistics 33
  GETTING STARTED 33
  RECORDING AND ORGANIZING YOUR FINDINGS 36
  USING STATISTICS TO ANALYZE YOUR DATA 39

CHAPTER 3 Using Tables and Figures 45
  TABLES 46
  FIGURES 53
  CHECKLIST FOR TABLES AND FIGURES 66

CHAPTER 4 Writing Lab Reports and Research Papers 68
  TITLE 69
  ABSTRACT 72
Contents

INTRODUCTION 76
MATERIALS AND METHODS 78
RESULTS 83
DISCUSSION 89
ACKNOWLEDGMENTS 94
LITERATURE CITED 94
CHECKLIST FOR LAB REPORTS AND RESEARCH PAPERS 94
SAMPLE LABORATORY REPORT 96
SAMPLE STUDENT RESEARCH PAPER 102

CHAPTER 5 Writing a Review Paper 114
CHOOSING A TOPIC 115
DECIDING ON A TITLE 116
WORKING WITH THE LITERATURE 116
PRESENTING YOUR MATERIAL 117
CHECKLIST FOR REVIEW PAPERS 128
SAMPLE REVIEW PAPER 129

CHAPTER 6 Documenting the Paper 137
CITING SOURCES IN THE TEXT 137
CSE Style 138
APA Style 145
PREPARING THE LITERATURE CITED SECTION 152
CSE Style 153
APA Style 160

CHAPTER 7 Drafting and Revising 167
THE FIRST DRAFT 167
PRACTICAL SUGGESTIONS FOR REVISING 170
CHECKING CONTENT AND STRUCTURE 175
IMPROVING PARAGRAPHS 176
WRITING CLEAR, ACCURATE SENTENCES 178
AVOIDING WORDINESS 187
VERB TENSE 191
PUNCTUATION 192
CHAPTER 8 Preparing the Final Draft 196
MECHANICS AND TECHNICALITIES 196
MANUSCRIPT FORMAT 201
WRITING AN ACKNOWLEDGMENTS SECTION 204
PROOFREADING 205

CHAPTER 9 Using Writing to Prepare for Examinations 206
GETTING THE MOST OUT OF TEXTBOOKS 206
TAKING GOOD LECTURE NOTES 207
PREPARING FOR LABORATORY EXAMS 208
STUDYING FOR SHORT-ANSWER QUESTIONS 210
ANSWERING ESSAY QUESTIONS 212

CHAPTER 10 Other Forms of Biological Writing 215
ORAL PRESENTATIONS 215
SAMPLE POWERPOINT PRESENTATION 219
POSTER PRESENTATIONS 226
SAMPLE POSTER PRESENTATION 231
RESEARCH PROPOSALS 234
SAMPLE RESEARCH PROPOSAL 236
LETTERS OF APPLICATION 243
SAMPLE COVER LETTER 245
RÉSUMÉS 246
SAMPLE RÉSUMÉ 249
SAMPLE CURRICULUMVITAE 250

Additional Readings 253

Literature Cited 256

Index 257