Preface xv
A Word to International Readers xix
Acknowledgments xxi

PART I: SOME PRELIMINARIES

1 What Is Scientific Writing? 3
   The Scope of Scientific Writing 3
   The Need for Clarity 3
   Receiving the Signals 4
   Understanding the Signals 4
   Organization and Language in Scientific Writing 4

2 Historical Perspectives 6
   The Early History 6
   The Electronic Era 7
   The IMRAD Story 8

3 Approaching a Writing Project 11
   Establishing the Mind-Set 11
   Preparing to Write 12
   Doing the Writing 13
   Revising Your Work 15
# Contents

## 4 What Is a Scientific Paper? 18
- Definition of a Scientific Paper 18
- Organization of a Scientific Paper 20
- Other Definitions 22

## 5 Ethics in Scientific Publishing 24
- Ethics as a Foundation 24
- Authenticity and Accuracy 24
- Originality 25
- Credit 26
- Ethical Treatment of Humans and Animals 27
- Disclosure of Conflicts of Interest 27

## 6 Where to Submit Your Manuscript 28
- Why Decide Early, Why Decide Well 28
- Prestige, Access, and Impact 30
- Other Factors to Consider 33
- Using Instructions to Authors 34

## PART II: PREPARING THE TEXT

### 7 How to Prepare the Title 39
- Importance of the Title 39
- Length of the Title 40
- Need for Specific Titles 40
- Importance of Syntax 41
- The Title as a Label 42
- Abbreviations and Jargon 43
- Series Titles 43

### 8 How to List the Authors and Addresses 45
- The Order of the Names 45
- Definition of Authorship 47
- Defining the Order: An Example 48
- Specifying Contributions 49
- Proper and Consistent Form 49
- Listing the Addresses 50
- Purposes 51
9 How to Prepare the Abstract 53
Definition 53
Types of Abstracts 55
Economy of Words 57

10 How to Write the Introduction 59
Suggested Rules 59
Reasons for the Rules 60
Some Exceptions 61
Citations and Abbreviations 61

11 How to Write the Materials and Methods Section 63
Purpose of the Section 63
Materials 64
Methods 65
Headings 65
Measurements and Analysis 65
Need for References 66
Tables and Figures 66
Correct Form and Grammar 67

12 How to Write the Results 69
Content of the Results 69
How to Handle Numbers 70
Strive for Clarity 70
Avoid Redundancy 71
A Supplement on Supplementary Material Online 71

13 How to Write the Discussion 72
Discussion and Verbiage 72
Components of the Discussion 73
Factual Relationships 73
Noting Strengths and Limitations 74
Significance of the Paper 75
Defining Scientific Truth 75

14 How to State the Acknowledgments 76
Ingredients of the Acknowledgments 76
Being Courteous 76
15 How to Cite the References 78
   Rules to Follow 78
   Electronic Aids to Citation 79
   Citation in the Text 79
   Reference Styles 80
      Name and Year System 81
      Alphabet-Number System 82
      Citation Order System 82
   Titles and Inclusive Pages 83
   Journal Abbreviations 83
   Examples of Different Reference Styles 84
   Citing Electronic Material 85
   One More Reason to Cite Carefully 85

PART III: PREPARING THE TABLES AND FIGURES

16 How to Design Effective Tables 89
   When to Use Tables 89
   How to Arrange Tabular Material 92
   Exponents in Table Headings 94
   Following the Journal’s Instructions 94
   Titles, Footnotes, and Abbreviations 95
   Additional Tips on Tables 95

17 How to Prepare Effective Graphs 97
   When Not to Use Graphs 97
   When to Use Graphs 99
   How to Prepare Graphs 99
   Symbols and Legends 102
   A Few More Tips on Graphs 103

18 How to Prepare Effective Photographs 104
   Photographs and Micrographs 104
   Submission Formats 104
   Cropping 105
   Necessary Keys and Guides 105
   Color 109
   Line Drawings 109
PART IV: PUBLISHING THE PAPER

19 Rights and Permissions 113
   What Is Copyright? 113
   Copyright Considerations 114
   Copyright and Electronic Publishing 115

20 How to Submit the Manuscript 117
   Checking Your Manuscript 117
   Submitting Your Manuscript 118
      Electronic Submission 118
      Conventional Submission 119
   The Cover Letter 120
   Sample Cover Letter 120
   Electronic Cover Letters 121
   Confirmation of Receipt 121

21 The Review Process (How to Deal with Editors) 122
   Functions of Editors, Managing Editors, and
      Manuscript Editors 122
   The Review Process 124
   The Editor’s Decision 127
   The Accept Letter 128
   The Modify Letter 129
   The Reject Letter 131
   Editors as Gatekeepers 134

22 The Publishing Process (How to Deal with Proofs) 135
   The Copyediting and Proofing Processes 135
   Why Proofs Are Sent to Authors 136
   Misspelled Words 136
   Marking the Corrections 138
   Additions to the Proofs 139
   Addition of References 140
   Proofing the Illustrations 141
   When to Complain 141
   Reprints 142
PART V: DOING OTHER WRITING FOR PUBLICATION

23 How to Write a Review Paper 147
   Characteristics of a Review Paper 147
   Preparing an Outline 148
   Types of Reviews 149
   Writing for the Audience 150
   Importance of Introductory Paragraphs 150
   Importance of Conclusions 150

24 How to Write Opinion (Book Reviews, Editorials, and Letters to the Editor) 152
   Writing Informed Opinion 152
   Book Reviews 152
   Editorials 154
   Letters to the Editor 154

25 How to Write a Book Chapter or a Book 156
   How to Write a Book Chapter 156
   Why (or Why Not) to Write a Book 157
   How to Find a Publisher 157
   How to Prepare a Book Manuscript 159
   How to Participate in the Publication Process 160
   How to Help Market Your Book 162

26 How to Write for the Public 164
   Why Write for General Readerships? 164
   Finding Publication Venues 164
   Engaging the Audience 166
   Conveying Content Clearly 167
   Emulating the Best 168

PART VI: CONFERENCE COMMUNICATIONS

27 How to Present a Paper Orally 173
   How to Get to Present a Paper 173
   Organization of the Paper 174
Contents

Presentation of the Paper 174
Slides 175
The Audience 176
A Few Answers on Questions 177

28 How to Prepare a Poster 179
  Popularity of Posters 179
  Organization 180
  Preparing the Poster 181
  Presenting the Poster 182

29 How to Write a Conference Report 184
  Definition 184
  Format 185
  Presenting the New Ideas 186
  Editing and Publishing 186

PART VII: SCIENTIFIC STYLE

30 Use and Misuse of English 191
  Keep It Simple 191
  Dangling Modifiers 192
  The Ten Commandments of Good Writing 193
  Metaphorically Speaking 194
  Misuse of Words 195
  Tense in Scientific Writing 197
  Active versus Passive Voice 198
  Euphemisms 199
  Singulars and Plurals 199
  Noun Problems 200
  Numbers 201
  Odds and Ends 201

31 Avoiding Jargon 204
  Definition of Jargon 204
  Mumblespeak and Other Sins 204
  Mottoes to Live By 206
  Bureaucratese 206
  Special Cases 208
32 How and When to Use Abbreviations 210
   General Principles 210
   Good Practice 211
   Units of Measurement 212
   Special Problems 212
   SI (Système International) Units 213
   Other Abbreviations 213

33 Writing Clearly Across Cultures and Media 214
   Readable Writing 214
   Consistency in Wording 216
   Serving International Readers 216
   A Few Words on E-Mail Style 217
   Writing for Online Reading 217

34 How to Write Science in English as a Foreign Language 219
   English as the International Language of Science 219
   The Essentials: Content, Organization, and Clarity 219
   Cultural Differences to Consider 220
   Some Common Language Challenges 222
   More Strategies for English-Language Writing 222
   More Resources 223

PART VIII: OTHER TOPICS IN SCIENTIFIC COMMUNICATION

35 How to Write a Thesis 227
   Purpose of the Thesis 227
   Tips on Writing 228
   When to Write the Thesis 230
   Relationship to the Outside World 231
   From Thesis to Publication 231

36 How to Prepare a Curriculum Vitae 233
   What’s a CV? What’s It Good For? 233
   What to Put In (and What to Leave Out) 235
   Other Suggestions 235
   Preparing a Cover Letter 236
   Writing a Personal Statement 237
### How to Prepare Grant Proposals and Progress Reports 239

- Preparing a Grant Proposal 239
  - Identifying Potential Sources of Funding 240
  - Preliminary Letters and Proposals 240
  - Common Parts of a Proposal 241
  - Preparing to Write the Proposal 242
  - Writing the Proposal 242
  - Common Reasons for Rejection 244
  - Other Problems to Watch For 245
  - Resubmitting a Proposal 246
  - Two Closing Comments 247
- Writing a Progress Report 247
  - Basic Structure 248
  - Some Suggestions 248

### How to Write a Recommendation Letter— and How to Ask for One 249

- Deciding Whether to Write the Letter 249
- Gathering the Information 250
- Writing the Letter(s) 250
- A Light Aside 251
- If You’re Seeking Recommendation Letters 252

### How to Work with the Media 253

- Before the Interview 253
- During the Interview 254
- After the Interview 255

### How to Provide Peer Review 257

- Responding to a Request for Peer Review 257
- Peer Reviewing a Scientific Paper 258
- Providing Informal Peer Review 261

### How to Seek a Scientific-Communication Career 262

- Career Options in Scientific Communication 262
- An Admittedly Unvalidated Quiz 263
- Career Preparation 264
- Entering the Field and Keeping Up 265
# Table of Contents

- Appendix 1: Selected Journal Title Word Abbreviations  267
- Appendix 2: Words and Expressions to Avoid  271
- Appendix 3: Prefixes and Abbreviations for SI (Système International) Units  277
- Appendix 4: Some Helpful Websites  279
- Glossary of Technical Terms  281
- References  287
- Index  293