CONTENTS

FOREWORD xi
   Alpheus Bingham

PREFACE xv

CONTRIBUTORS xix

PART I GETTING PEOPLE TO COLLABORATE 1

1. The Need for Collaborative Technologies in Drug Discovery 3
   Chris L. Waller, Ramesh V. Durvasula, and Nick Lynch

2. Collaborative Innovation: The Essential Foundation of Scientific Discovery 19
   Robert Porter Lynch

3. Models for Collaborations and Computational Biology 39
   Shawnmarie Mayrand-Chung, Gabriela Cohen-Freue, and Zsuzsanna Hollander

4. Precompetitive Collaborations in the Pharmaceutical Industry 55
   Jackie Hunter

5. Collaborations in Chemistry 85
   Sean Ekins, Antony J. Williams, and Christina K. Pikas

6. Consistent Patterns in Large-Scale Collaboration 99
   Robin W. Spencer
## Contents

### 7. Collaborations Between Chemists and Biologists
   Victor J. Hruby  
   113

### 8. Ethics of Collaboration
   121

   John Wilbanks  
   133

---

### Part II Methods and Processes for Collaborations  
   147

### 10. Scientific Networking and Collaborations
   Edward D. Zanders  
   149

### 11. Cancer Commons: Biomedicine in the Internet Age
   Jeff Shrager, Jay M. Tenenbaum, and Michael Travers  
   161

### 12. Collaborative Development of Large-Scale Biomedical Ontologies
   Tania Tudorache and Mark A. Musen  
   179

### 13. Standards for Collaborative Computational Technologies for Biomedical Research
   Sean Ekins, Antony J. Williams, and Maggie A. Z. Hupcey  
   201

   Brian Pratt  
   209

### 15. Eight Years Using Grids for Life Sciences
   Vincent Breton, Lydia Maigne, David Sarramia, and David Hill  
   221

### 16. Enabling Precompetitive Translational Research: A Case Study
   Sándor Szalma  
   241

### 17. Collaboration in Cancer Research Community: Cancer Biomedical Informatics Grid (caBIG)
   George A. Komatsoulis  
   261

### 18. Leveraging Information Technology for Collaboration in Clinical Trials
   O. K. Baek  
   281

---

### Part III Tools for Collaborations  
   301

### 19. Evolution of Electronic Laboratory Notebooks
   Keith T. Taylor  
   303
20. Collaborative Tools to Accelerate Neglected Disease Research: Open Source Drug Discovery Model
   Anshu Bhardwaj, Vinod Scaria, Zakir Thomas, Santhosh Adayikkoth, Open Source Drug Discovery (OSDD) Consortium, and Samir K. Brahmachari

21. Pioneering Use of the Cloud for Development of Collaborative Drug Discovery (CDD) Database
   Sean Ekins, Moses M. Hohman, and Barry A. Bunin

22. Chemspider: a Platform for Crowdsourced Collaboration to Curate Data Derived From Public Compound Databases
   Antony J. Williams

23. Collaborative-Based Bioinformatics Applications
   Brian D. Halligan

24. Collaborative Cheminformatics Applications
   Rajarshi Guha, Ola Spjuth, and Egon Willighagen

PART IV THE FUTURE OF COLLABORATIONS

25. Collaboration Using Open Notebook Science in Academia
   Jean-Claude Bradley, Andrew S. I. D. Lang, Steve Koch, and Cameron Neylon

26. Collaboration and the Semantic Web
   Christine Chichester and Barend Mons

27. Collaborative Visual Analytics Environment for Imaging Genetics
   Zhiyu He, Kevin Ponto, and Falko Kuester

28. Current and Future Challenges for Collaborative Computational Technologies for the Life Sciences
   Antony J. Williams, Renée J. G. Arnold, Cameron Neylon, Robin W. Spencer, Stephan Schürer, and Sean Ekins

INDEX