Contents

Preface ............................................................... v
Contributors ........................................................ ix

SECTION I: INTERACTIONS

1. Mining Protein–Protein Interactions from Published Literature Using Linguamatics I2E ..................................................... 3
   Judith Bandy, David Milward, and Sarah McQuay

2. Relative Avidity, Specificity, and Sensitivity of Transcription Factor–DNA Binding in Genome-Scale Experiments .......................... 15
   Vladimir A. Kuznetsov

3. Curation of Inhibitor-Target Data: Process and Impact on Pathway Analysis .......................................................... 51
   Sreenivas Devidas

4. Profiling Protein Interaction Networks with Functional Protein Microarrays .................................................. 63
   Dawn R. Mattoon and Barry Schweitzer

5. Manual Annotation of Protein Interactions .................................................. 75
   Svetlana Bureeva, Svetlana Zvereva, Valentin Romanov, and Tatiana Serebryiskaya

SECTION II: ANALYSIS

6. Gene Set Enrichment Analysis .................................................. 99
   Charles A. Tilford and Nathan O. Siemers

7. PANTHER Pathway: An Ontology-Based Pathway Database Coupled with Data Analysis Tools .................................. 123
   Huaiyu Mi and Paul Thomas

8. Prioritizing Genes for Pathway Impact Using Network Analysis .................................................. 141
   Aaron N. Chang

9. Discovering Biological Networks from Diverse Functional Genomic Data .................................. 157
   Chad L. Myers, Camelia Chiriac, and Olga G. Troyanskaya

10. Functional Analysis of OMICs Data and Small Molecule Compounds in an Integrated “Knowledge-Based” Platform .......................... 177
    Yuri Nikolsky, Eugene Kirillov, Roman Zuev, Eugene Rakhmatulin, and Tatiana Nikolskaya

11. Kinetic Modeling as a Tool to Integrate Multilevel Dynamic Experimental Data .................................................. 197
    Ekaterina Mogilevskaya, Natalia Bagrova, Tatiana Plyushina, Nail Gizzatkulov, Eugeniy Metelkin, Ekaterina Goryacheva, Sergey Smirnov, Yuriy Kosinsky, Aleksander Dorodnov, Kirill Peskov, Tatiana Karelina, Igor Goryanin, and Oleg Demin
   Sarah Killcoyne, Gregory W. Carter, Jennifer Smith, and John Boyle
13. Semantic Data Integration and Knowledge Management to Represent Biological
    Network Associations ................................................................. 241
   Sascha Losko and Klaus Heumann
14. Solutions for Complex, Multi Data Type and Multi Tool Analysis: Principles and
    Applications of Using Workflow and Pipelining Methods. .................... 259
   Robin E. J. Munro and Yike Guo

SECTION III: APPLICATIONS
15. High-Throughput siRNA Screening as a Method of Perturbation of Biological
    Systems and Identification of Targeted Pathways Coupled with Compound
    Screening .................................................................................. 275
   Jeff Kiefer, Hongwei H. Yin, Qiang Q. Que, and Spyro Mousses
16. Pathway and Network Analysis with High-Density Allelic Association Data ...... 289
   Ali Torkamani and Nicholas J. Schork
17. miRNAs: From Biogenesis to Networks ........................................... 303
   Giuseppe Russo and Antonio Giordano
18. MetaMiner (CF): A Disease-Oriented Bioinformatics Analysis
    Environment ........................................................................... 353
   Jerry M. Wright, Yuri Nikolsky, Tatiana Serebryiskaya, and Diana R. Wetmore
19. Translational Research and Biomedical Informatics ................................. 369
   Michael Liebman
20. ArrayTrack: An FDA and Public Genomic Tool .................................... 379
   Hong Fang, Stephen C. Harris, Zhenjiang Su, Minjun Chen, Feng Qian,
   Leming Shi, Roger Perkins, and Weida Tong

Index ............................................................................................. 399
Protein Networks and Pathway Analysis
Nikolsky, Y.; Bryant, J. (Eds.)
2009, XIV, 410 p. 118 illus., Hardcover
A product of Humana Press