

CONTENTS

| | |
|--|------|
| Preface | v |
| List of Contributors | xiii |
| Acknowledgments | xix |
| 1. General Characteristics of Prokaryotic Genomes | 1 |
| <i>Jan Mrázek and Anne O. Summers</i> | |
| 2. Genes in Prokaryotic Genomes and Their Computational Prediction | 39 |
| <i>Rajeev K. Azad</i> | |
| 3. Evolution of the Genetic Code: Computational Methods and Inferences | 75 |
| <i>Greg Fournier</i> | |
| 4. Dynamics of Prokaryotic Genome Evolution | 99 |
| <i>Pascal Lapierre</i> | |
| 5. Mobile Genetic Elements and Their Prediction | 113 |
| <i>Morgan G.I. Langille, Fengfeng Zhou, Amber Fedynak, William W.L. Hsiao, Ying Xu and Fiona S.L. Brinkman</i> | |
| 6. Horizontal Gene Transfer: Its Detection and Role in Microbial Evolution | 137 |
| <i>J. Peter Gogarten and Olga Zhaxybayeva</i> | |
| 7. Genome Reduction During Prokaryotic Evolution | 153 |
| <i>Francisco J. Silva and Amparo Latorre</i> | |
| 8. Comparative Mechanisms for Transcription and Regulatory Signals in Archaea and Bacteria | 185 |
| <i>Agustino Martínez-Antonio and Julio Collado-Vides</i> | |

| | |
|---|-----|
| 9. Computational Techniques for Orthologous Gene Prediction in Prokaryotes | 209 |
| <i>Maria Poptsova</i> | |
| 10. Computational Elucidation of Operons and Uber-operons | 233 |
| <i>Phuongan Dam, Fenglou Mao, Dongsheng Che, Ping Wan, Thao Tran, Guojun Li and Ying Xu</i> | |
| 11. Prediction of Regulons Through Comparative Genome Analyses | 259 |
| <i>Zhengchang Su, Guojun Li and Ying Xu</i> | |
| 12. Prediction of Biological Pathways Through Data Mining and Information Fusion | 281 |
| <i>Fenglou Mao, Phuongan Dam, Hongwei Wu, I-Chun Chou, Eberhard Voit and Ying Xu</i> | |
| 13. Microbial Pathway Models | 315 |
| <i>Siren R. Veflingstad, Phuongan Dam, Ying Xu and Eberhard O. Voit</i> | |
| 14. Metagenomics | 345 |
| <i>Kayo Arima and John Wooley</i> | |
| References | 397 |
| Index | 467 |