

Next-generation Sequencing

Current Technologies and Applications



Edited by: **Jianping Xu**

McMaster University, Ontario, Canada

Published: March 2014 (book); February 2014 (ebook). **Pages:** xii + 160

Book: ISBN 978-1-908230-33-1 £120, \$240. **Ebook:** ISBN 978-1-908230-95-9 £120, \$240

Published by: Caister Academic Press www.caister.com

High-throughput, next-generation sequencing (NGS) technologies are capable of producing a huge amount of sequence data in a relatively short time and have revolutionized genome research in recent years. The powerful and flexible nature of NGS has made it an indispensable tool for a broad spectrum of biological sciences and NGS technologies have transformed scientific research in many fields.

Written by experts from around the world, this book explores the most recent advances in NGS instrumentation and data analysis. The book begins with a comprehensive description of current NGS platforms, their sequencing chemistries, instrument specifications, and general workflows and procedures. A separate chapter is dedicated to low-quantity, single molecule sequencing technology. Further chapters explore the application of NGS technologies in various fields including polymorphism detection, sRNA research, rare variant detection, large variant detection, exome sequencing, plant development studies, microbial metagenomics, and studies on the human microbiome.

Practical and cutting-edge, this volume represents an excellent collection of chapters to aid all scientists who wish to apply these innovative research tools.

Chapter 1. An Overview of Next-generation Genome Sequencing Platforms. *Chandra Shekhar Pareek*

Chapter 2. Attomole-Level Genomics with Single-molecule Direct DNA, cDNA and RNA Sequencing Technologies. *Fatih Ozsolak*

Chapter 3. SNP Assessment on Draft Genomes from Next Generation Sequencing Data. *Michael Piechotta and Christoph Dieterich*

Chapter 4. Processing Large-scale Small RNA Datasets *in Silico*. *Daniel Mapleson, Irina Mohorianu, Helio Pais, Matthew Stocks, Leighton Folkes and Vincent Moulton*

Chapter 5. Utility of High Throughput Sequence Data in Rare Variant Detection. *Viacheslav Y. Fofanov, Tudor Constantin, Heather Koshinsky and Eureka Genomics*

Chapter 6. Detecting Break Points of Insertions and Deletions from Paired-end Short Reads. *Kai Ye and Zemin Ning*

Chapter 7. Novel Insights from Re-sequencing of Human Exomes Through NGS. *Jun Li, Tao Jiang, Xu Yang and Jun Wang*

Chapter 8. Insights on Plant Development Using NGS Technologies. *Ying Wang and Yuling Jiao*

Chapter 9. Next Generation Sequencing and the Future of Microbial Metagenomics. *Andreas Wilke, Peter Larsen and Jack A Gilbert*

Chapter 10. Next Generation Sequencing, Metagenomes and the Human Microbiome. *Karen E. Nelson, Ramana Madupu, Sebastian Szpakowski, Johannes Goll, Konstantinos Krampis and Barbara A. Methé*

Order from:

Caister Academic Press, c/o Book Systems Plus <http://www.caister.com/order>

☞ **MALDI-TOF Mass Spectrometry in Microbiology**

Edited by: Markus Kostrzewa and Sören Schubert (Published: 2016)

☞ ***Aspergillus* and *Penicillium* in the Post-genomic Era**

Edited by: Ronald P. de Vries, Isabelle Benoit Gelber and Mikael Rørdam Andersen (Published: 2016)

☞ **The Bacteriocins: Current Knowledge and Future Prospects**

Edited by: Robert L. Dorit, Sandra M. Roy and Margaret A. Riley (Published: 2016)

☞ **Omics in Plant Disease Resistance**

Edited by: Vijai Bhadauria (Published: 2016)

☞ **Acidophiles: Life in Extremely Acidic Environments**

Edited by: Raquel Quatrini and D. Barrie Johnson (Published: 2016)

☞ **Climate Change and Microbial Ecology: Current Research and Future Trends**

Edited by: Jürgen Marxsen (Published: 2016)

☞ **Biofilms in Bioremediation: Current Research and Emerging Technologies**

Edited by: Gavin Lear (Published: 2016)

☞ **Microalgae: Current Research and Applications**

Edited by: Maria-Nefeli Tsaloglou (Published: 2016)

☞ **Gas Plasma Sterilization in Microbiology: Theory, Applications, Pitfalls and New Perspectives**

Edited by: Hideharu Shintani and Akikazu Sakudo (Published: 2016)

☞ **Virus Evolution: Current Research and Future Directions**

Edited by: Scott C. Weaver, Mark Denison, Marilyn Roossinck and Marco Vignuzzi (Published: 2016)

☞ **Arboviruses: Molecular Biology, Evolution and Control**

Edited by: Nikos Vasilakis and Duane J. Gubler (Published: 2016)

☞ ***Shigella*: Molecular and Cellular Biology**

Edited by: William D. Picking and Wendy L. Picking (Published: 2016)

☞ **Aquatic Biofilms: Ecology, Water Quality and Wastewater Treatment**

Edited by: Anna M. Romání, Helena Guasch and M. Dolors Balaguer (Published: 2016)

☞ **Alphaviruses: Current Biology**

Edited by: Suresh Mahalingam, Lara Herrero and Belinda Herring (Published: 2016)

☞ **Thermophilic Microorganisms**

Edited by: Fu-Li Li (Published: 2015)

☞ **Flow Cytometry in Microbiology: Technology and Applications**

Edited by: Martin G. Wilkinson (Published: 2015)

"an impressive group of experts" ([ProtoView](#))

☞ **Probiotics and Prebiotics: Current Research and Future Trends**

Edited by: Koen Venema and Ana Paula do Carmo (Published: 2015)

☞ **Epigenetics: Current Research and Emerging Trends**

Edited by: Brian P. Chadwick (Published: 2015)

"this is one text you don't want to miss" ([Epigenie](#)); "up-to-date information" ([ChemMedChem](#))

☞ ***Corynebacterium glutamicum*: From Systems Biology to Biotechnological Applications**

Edited by: Andreas Burkovski (Published: 2015)

"Without question a valuable book" ([BIOSpektrum](#))

☞ **Advanced Vaccine Research Methods for the Decade of Vaccines**

Edited by: Fabio Bagnoli and Rino Rappuoli (Published: 2015)