Next-Generation DNA Sequencing Informatics, Second Edition

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Next-Generation DNA Sequencing Informatics, Second Edition From imusti

Next-generation DNA sequencing (NGS) technology has revolutionized biomedical research, making genome and RNA sequencing an affordable and frequently used tool for a wide variety of research applications including variant (mutation) discovery, gene expression, transcription factor analysis, metagenomics, and epigenetics. Bioinformatics methods to support DNA sequencing have become and remain a critical bottleneck for many researchers and organizations wishing to make use of NGS technology. This new edition provides a thorough, plain-language introduction to the necessary informatics methods and tools for analyzing NGS data and provides detailed descriptions of algorithms, strengths and weaknesses of specific tools, pitfalls, and alternative methods. Four new chapters cover experimental design, sample preparation, and quality assessment of NGS data; public databases for DNA sequencing data; de novo transcript assembly; proteogenomics; and emerging sequencing technologies. The remaining chapters from the first edition have been updated with the latest information. This book also provides extensive reference to best-practice bioinformatics methods for NGS applications and tutorials for common workflows. This edition addresses the informatics needs of students, laboratory scientists, and computing specialists who wish to take advantage of the explosion of research opportunities offered by new DNA sequencing technologies.

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Next-Generation DNA Sequencing Informatics, Second Edition From imusti Bibliography

- Sales Rank: #1323376 in Books
- Brand: imusti
- Published on: 2015-06-30
- Original language: English
- Number of items: 1
- Dimensions: 7.20" h x 1.20" w x 10.30" l, .0 pounds
- Binding: Hardcover
- 402 pages

Editorial Review

About the Author

Stuart M. Brown is an Associate Professor at the NYU Center for Health Informatics and Bioinformatics. He leads a consulting group focused on Sequencing Informatics and teaches graduate Bioinformatics courses. His current research includes de novo sequencing/assembly/annotation of interesting genomes, RNA-seq gene expression studies, motif analysis of gene regulatory domains, and data management for integrative genomics projects. He is the author of Next-Generation DNA Sequencing Informatics (2012, 2015) and Essentials of Medical Genomics (2008). He received his PhD. in molecular biology from Cornell University in 1992 and his BS in Botany from the University of Michigan in 1983.

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