

Chapman & Hall/CRC
Mathematical and Computational Biology Series

An emerging, ever-evolving branch of science, bioinformatics has paved the way for the explosive growth in the distribution of biological information to a variety of biological databases, including the National Center for Biotechnology Information. For growth to continue in this field, biologists must obtain basic computer skills while computer specialists must possess a fundamental understanding of biological problems. Bridging the gap between biology and computer science, **Bioinformatics: A Practical Approach** assimilates current bioinformatics knowledge and tools relevant to the omics age into one cohesive, concise, and self-contained volume.

Written by expert contributors from around the world, this practical book presents the most state-of-the-art bioinformatics applications. The first part focuses on genome analysis, common DNA analysis tools, phylogenetics analysis, and SNP and haplotype analysis. After chapters on microarray, SAGE, regulation of gene expression, miRNA, and siRNA, the book presents widely applied programs and tools in proteome analysis, protein sequences, protein functions, and functional annotation of proteins in murine models. The last part introduces the programming languages used in biology, website and database design, and the interchange of data between Microsoft Excel and Access.

Keeping complex mathematical deductions and jargon to a minimum, this accessible book offers both the theoretical underpinnings and practical applications of bioinformatics.

Features

- Provides theoretical introductions followed by step-by-step tutorials and sample datasets of practical applications in each chapter
- Demonstrates how to screen out genes of interest from genomics, transcriptomics, proteomics, and other integrative databases
- Shows how to retrieve single nucleotide polymorphism and haplotype data
- Covers the most commonly used biocomputing tools and program languages, including Perl, Java, and R
- Contains a list of useful websites and databases as well as more than 250 figures to complement the text



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