

Second edition

Bioinformatics for Geneticists

A bioinformatics primer for the analysis of genetic data

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The study of human genetics is moving into a challenging new era of discovery. New technologies and data resources such as the HapMap, are enabling genome-wide genetic association studies which could potentially identify most common (and some rarer) genetic determinants of human health, disease and drug response. Although the tools may be at hand, more than ever care is required in their use. Faced with the sheer volume of data threatening to drown true signal in noise, bioinformatics is now assuming a central role in genetic study design, analysis and interpretation.

Coupled with the advances in genetics, new insights are emerging into additional layers of complexity in genome function, for example the role of micro RNA in control of gene translation and new *cis*-regulatory elements identified by genetic analysis of gene expression. Understanding genetics will require an effective synthesis of this complexity and, as this book shows, this is simply not possible without bioinformatics.

Bioinformatics for Geneticists seeks to describe the key bioinformatics and genetic analysis processes that are needed to identify human genetic determinants. The book is based upon the combined practical experience of domain experts from academic and industrial research environments and should be of interest to a broad audience, including students, researchers and clinicians working in the human genetics domain.

- More than 50% of chapters are completely new contributions, covering data manipulation and management, the HapMap, micro RNA, comparative genomics, epigenetics, cancer genetics, genetic analysis of gene expression, high-density genome scan analysis, pharmacogenetics and drug discovery.
- Dramatically revised content in core areas of gene and genomic characterization, pathway analysis, SNP functional analysis and statistical genetics.
- Focused on freely available tools and web-based approaches to bioinformatics analysis, suitable for novices and experienced researchers alike.
- The only book specifically addressing the bioinformatics needs of geneticists.



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