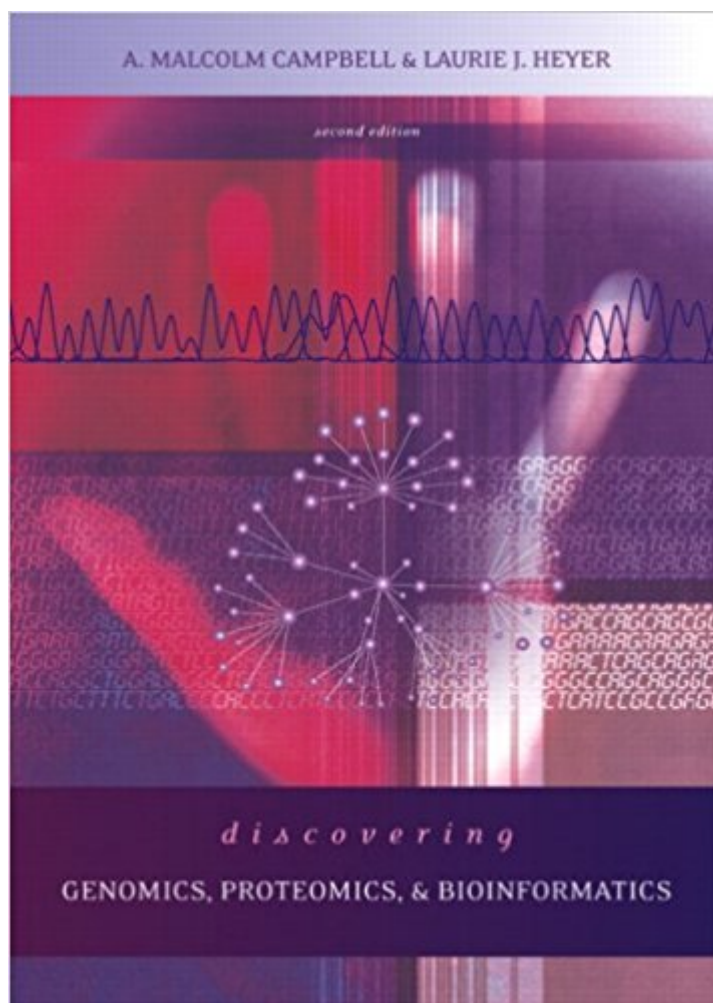


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# Discovering Genomics, Proteomics And Bioinformatics (2nd Edition)



## Synopsis

**KEY BENEFIT:** Discovering Genomics is the first genomics text that combines web activities and case studies with a problem-solving approach to teach upper-level undergraduates and first-year graduate students the fundamentals of genomic analysis. More of a workbook than a traditional text, Discovering Genomics, Second Edition allows students to work with real genomic data in solving problems and provides the user with an active learning experience. **KEY TOPICS:** Genomic Medicine Case Study: What's wrong with my child? Genome Sequence Acquisition and Analysis, Comparative Genomics in Evolution and Medicine, Genome Variations, Genomic Medicine Case Study: Why Can't I Just Take a Pill to Lose Weight? Basic Research with DNA Microarrays, Applied Research with DNA Microarrays, Proteomics, Genomic Medicine Case Study: Why Can't We Cure More Diseases? Genomic Circuits in Single Genes, Integrated Genomic Circuits, Modeling Whole-Genome Circuits. **MARKET:** For all readers interested in genomics.

## Book Information

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## Customer Reviews

Discovering Genomics, Proteomics, and Bioinformatics combines integrated Web exercises with a problem-solving approach to train readers in basic hands-on genomic analysis. The authors present global problems, then provide the tools of genomic analysis to help readers dissect the answer, thus encouraging critical thinking skills. Short boxed readings called "Math Minutes" explain the math behind the biology. For anyone interested in genomics, proteomics, or bioinformatics. --This text

refers to an out of print or unavailable edition of this title.

Purchased this as a text for a class. It made the concept understandable.

Good book..it has the essentials in what is needed for genomics and proteomics but the bioinformatics part is not that much elaborated

very nice! Don't remember if I brought it as new or else, but the condition is NEW! fast shipping.  
Very good, overall.

This book follows a convoluted path to describe basic methodologies that could be taught in a much more straightforward manner. The authors get so mired down in the biology of specific applications of bioinformatic tools that the tool itself falls into the background. The poor layout of the book even makes it difficult to read. The main text of the book is interspersed with examples, "Math Minutes" and other text which are not properly set off from the main text. The web links associated with the book are outdated and do not appear to be updated by the publisher to keep up with changes. If a web site is associated with a book, it should at the very least keep up with changes. In a quickly changing field such as bioinformatics these updates are absolutely critical. The book is also overpriced given the low quality content and paperback binding. The figures are subpar with only purple and gray coloring. I would expect at least a few full color figures for a book at this price point. Overall I would say that this book is not a useful tool for teaching bioinformatics or genomics.

The sheer number of books in the area of bioinformatics is growing rapidly, and each author takes a different approach to the topic: Bergeron's Bioinformatics Computing uses concepts from Information Theory, while Pervzner's Computational Molecular Biology uses Graph Theory and Durbin et. al. Biological Sequence Analysis use Statistics and hard core mathematical analysis to get the point across. Campbell and Heyer, the authors of Discovering Genomics, Proteomics, & Bioinformatics use concepts from Electrical Engineering and Control Engineering to prescribe some of the details of genomics and proteomics. As an instructor you need to choose the right book to meet the needs and understanding level of your target audience. For biology students that have little mathematics or statistics knowledge but have taken Physics II (E&M), this would be the perfect book. The authors are a little heaving on the biological terminologies, so a sophomore level Computer Science major with little or no biology background would have a difficult time coming up

to speed at the beginning, but the glossary of terms at the end of the book is comprehensive enough that can aid the learning process. The approach to figuring out what, where and how genes are controlled using what are called circuits is simply fascinating. Genes are controlled in three ways: location of the gene, the time of control and the amount. These three metrics can easily be mapped to circuit diagram in Electrical Engineering using the concept of switches (transistors) and time varying influencers (control theory and feedback loops), the authors describe of genes are regulated. One can imagine that the process of mapping genes into circuits is a difficult task, and one would be right. In fact, only one gene, the Endo16, has been fully expressed in circuit diagrams and that task took years of research. Imagine the amount of man power and hours it would take to draw the circuit diagram for the entire human genome of over 35000 genes! Even the concepts of noise in the circuit and complex integrated circuits are explored in details. The authors make no hesitation in telling the readers what the unknowns are and what topics are under intense investigation. It is amazing to realize that we still a long way to go, and what we are seeing thus far is just the beginning on a very long journey. In general, the book is very interactive filled with Discovery Questions, Math Minutes and a CD simply filled with tons and tons of pictures that are in PDF format that can be printed in need be. There is also a Web site that accompanies this book that explains various bioinformatics methods, and contains information required by some of the Discovery Questions. The text itself is divided into four units: 1) Genomic Sequences which talks about the whole picture of genomic analysis and its benefits. The question of why this field of study is so important and what we hope to gain from in the coming years and decades is also answered. The students are exposed to topics in the areas of biological weapons, antibiotics and how they work, the evolution and survival of DNA and ethical consequences of genetics and genetic engineering. 2) Genomic Expressions in which the how and where questions are answered in detail. How did we gather all of this information? DNA microarrays are discussed in detail including advanced research in the area and who is doing in. Proteins microarrays are also discussed, but not in as much details due to the fact that protein microarrays are very much in their infancies. The authors do make a number of predictions in terms of where the proteomics area of research is heading and what we need to get there. 3) Whole Genome Perspective. The bottom up approach takes the readers to the whole genome analysis, and that's where the authors discuss the notions of electronic circuits in describing the genome and proteins prescription. 4) Medical Case studies in the areas of drug discovery bring this book to an end. The authors tackle questions such as how a disease is discovered and researched, and go into some of the misconceptions of drug discovery and end the book with why discovering a new drug is such a difficult task. A complete text with the

entire information one would need to come up to speed with the area of life sciences. A good mix of biology, mathematics, statistics, engineering and computer science give the reader a comprehensive overview of the current problems, research areas and new developments in the field of bioinformatics. I recommend this text for a bioinformatics course with students of biology with little mathematics and statistics background. The text is easy to read and follow. The accompanying CD-Rom is filled with relevant pictures, graphs, etc, that can further the learning process.

This book is for students who have considerable knowledge of Biology that has included basic Genetics and Genomics. For those of us who studied Human Genetics in the 1960's it is a challenge to read and understand. If one is willing to study and learn completely new information including many new words and terms this book will enlighten one as to where we are in Genomics today and give insight into the future of Medicine. In the forty-five years that I have been a Family Physician there is nothing that has changed the practice of Medicine like this new field of Genomics and Proteomics most likely will. My suggestion to any physician who plans to practice more than five years is to buy this book and find a Professor like Dr. Campbell to guide you to understand this new and exciting subject.

This book represents a breakthrough in textbook design. It starts with a 'case study' for a child visiting you the physician. You get the basic symptoms from the mother, then you are sent to the web to go attempt to establish a diagnosis. And you are not sent to some private web site, but to the Online Mendelian Inheritance in Man (OMIM) database of human diseases and genes, and to the National Center for Biotechnology Information. Immediately the student is exposed to a wealth of information far beyond what any book could provide. It's rare that you see a textbook that attempts to take the student into the real world. Intermixed with the case studies is textual materials that provide the student with the basic background that they need. In addition there are almost random Math Minutes and Discovery Questions that direct the student into further depth of understanding. If you are planning to teach this kind of class, you owe it to yourself to at least investigate this book before selecting a text.

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