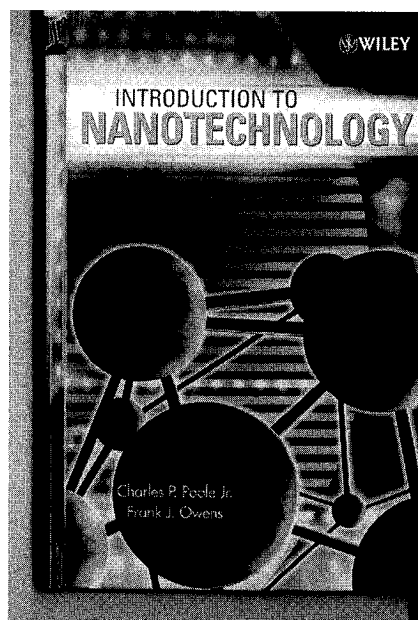


**Introduction to Nanotechnology.** Charles P. Poole, Jr., and Frank J. Owens. Hoboken, NJ: John Wiley & Sons, 2003, 400 pp., \$79.95, hardcover. ISBN 0-471-07935-9.



The completion of the Human Genome Project, expanded knowledge in molecular genetics, and breakthroughs in our understanding of genetic material have dramatically changed every field of life sciences. They have spurred the growth of DNA technology and the development of DNA diagnostics, but several challenges persist in the analyses of nucleic acids. Each advance in technology, each new application, each step forward in automation and reduction in the time and work required to perform molecular testing expands the potential of molecular diagnostics to impact the clinical management of patients and their families. In the future, nanotechnology will likely propel this laboratory testing forward rapidly.

Nanotechnology is the creation and utilization of materials, devices, and systems through the control of matter at the nanometer-length scale, at the level of atoms, molecules, and supramolecular structures. This book provides an in-depth description of different topics concerning nanotechnology and the characteristics of sol-

ids at the nanoscale level. The first three chapters describe the physical and chemical theory of solid states, properties of bulk materials, and methods to measure these properties. When the sizes of materials are reduced to the micrometer or nanometer range, many of their properties, such as mechanical, ferroelectric, and ferromagnetic, change. Subsequent chapters cover the properties of nanostructures as individual nanoparticles or as bulk solids made by basic units having nanosized dimension. Two separate chapters are devoted to nanostructures of carbon and to ferromagnetism. Methods to study and produce nanomaterials are discussed in chapters 8 through 10.

Because many organic compounds and biological materials are in the size range from 1 to 100 nm, they can be classified as nanoparticles. For example, the combination of amino acids to construct a polypeptide and nucleotides to construct a DNA chain can be considered nanowires. An overview focused on nanodimensional aspects of organic compounds and biological materials is found in chapters 11 and 12. Finally, the last chapter deals with some applications of nanotechnology in the development of "nanodevices" and "nanomachines", from current microelectromechanical and nanomechanical systems (MEMS and NEMS) to future computer technology.

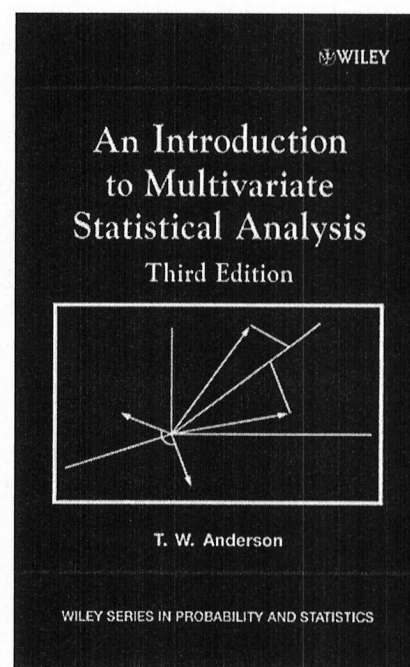
The book is well written and very nicely illustrated. For each topic the authors include an overview and some theoretical background information, which helps in the comprehension of a subject that is particularly complex for an outsider. Even if the matter is not addressed primarily to clinical and laboratory scientists, this book offers a large amount of useful information to those who want to be introduced to the nanotechnologies.

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**An Introduction to Multivariate Statistical Analysis, 3rd ed.** T.W. Anderson. Hoboken, NJ: John Wiley & Sons, 2003, 742 pp., \$99.95, hardcover. ISBN 0-471-36091-0.



This third edition is a wonderful textbook for graduate students studying statistics or professional statisticians interested in a thorough introduction to the mathematical theory underlying many common multivariate statistical methods. However, if you are a laboratory scientist lacking a strong mathematical background, this book is not for you.

The author earned his PhD in mathematics at Princeton in 1945 and has been an influential figure in the statistical field for many decades. In addition to this book, he is also the author of *The Statistical Analysis of Time Series*. The first edition of *An Introduction to Multivariate Statistical Analysis* was derived from lecture notes used in a two-semester sequence of graduate courses given at Columbia University. Published in 1958, it was one of the early books on multivariate statistical analysis, along with M.G. Kendall's monograph, *A Course in Multivariate Analysis*, published in 1957, and S.N. Roy's *Some Aspects of Multivariate*

*Analysis*, published the same year. It was intended for individuals interested in a "mathematically rigorous development" of the statistical methods. A background in univariate statistical theory and matrix algebra is a prerequisite.

This latest edition retains its focus on mathematical theory but has been updated to include recent theoretical developments. The book contains a comprehensive reference list. Of the 446 references, 48 have been published since 1984, when the second edition of the text appeared, and 167 were published before 1958. Many of the classic multivariate statistical topics are covered, including the multivariate normal distribution, multivariate classification, multivariate analysis of variance, principal components, canonical correlation, and factor analysis. Unfortunately, computer software for performing multivariate analysis is not ad-

dressed. Likewise, multivariate data analysis methods that rely on computer-intensive techniques are not covered. The book follows the theorem/proof format common in many mathematics texts. Most problems appearing at the end of each chapter also request a proof. Only three actual data sets appear in the entire book, one is introduced in the text, and the other two are presented in problems at the end of a chapter. All of the data appearing in the book are from publications before 1958.

Topics that some laboratorians might look for in a book with the word "multivariate" in the title that are not covered in this book include cluster analysis; various forms of multiple regression analysis, including multiple linear regression, logistic regression, and proportional hazards regression (survival analysis); and methods for the graphic presentation of multivariate data.

If you are looking for a text that covers the mathematical theory of multivariate statistical analysis, this book will serve you well, but if you are looking for a text that addresses how to analyze and interpret multivariate data, then a text on multivariate data analysis (as opposed to multivariate statistical analysis) such as *Computer-Aided Multivariate Analysis* by Afifi, May, and Clark, or *Applied Multivariate Data Analysis* by Everitt and Dunn would probably be a better choice.

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### Correction

In the Technical Brief entitled "Rapid  $\beta$ -Globin Genotyping by Multiplexing Probe Melting Temperature and Color" by M.G. Herrmann, S.F. Dobrowolski, and C.T. Wittwer (*Clin Chem* 2000;46:425-8), the primer sequences should read as follows: sense, 5'-AGTCAGGGCAGAGCCATCTA-3'; antisense, 5'-GTTTCTATTGGTCTCCTTAAACCTG-3'. In addition, the sequence for the LCR640 probe should read 5'-CTCCTGTGGAGAAGTCTGC-LCR640. The authors thank Jonathan Duczowski for pointing out these errors.

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