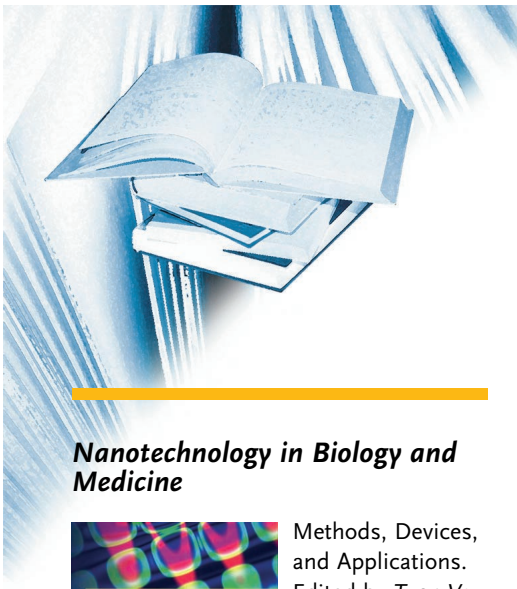
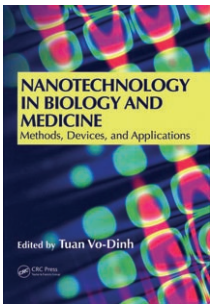


Nanotechnology in Biology and Medicine



Methods, Devices, and Applications. Edited by *Tuan Vo-Dinh*. CRC Press/Taylor & Francis, Boca Raton 2007. 616 pp., hardcover $ 149.95.—ISBN 978-0-8493-2949-4

During the last decade the emerging field of nanotechnology has started to influence and revolutionize many areas of science. Nanotechnology concepts are particularly interesting for the life sciences, where the fact that artificial nanostructures and biological structures often have similar dimensions allows an efficient intercommunication between nanotechnology, biology, and medicine.

This timely book is a collection of 39 chapters dealing with different aspects of nanotechnology in biology and medicine. The contributions are arranged in two sections. Section I is entitled "Nanomaterials, Nanostructures, and Nanotools", while Section II deals with "Applications in Biology and Medicine".

After an introductory chapter written by the editor, the first chapters discuss various nanostructures with an emphasis on their biomedical applications. These include: self-assembled organic nanotubes; silicon, gold, and bimetallic nanoparticles; nanowires; quantum dots; and various more complex bio-inspired nanomaterials and nanodevices, such as nucleoprotein-based nanodevices for drug delivery, and nanotube-based membrane systems.

A second group of chapters in Section I focuses on new nanotechnology-based tools and methods, such as nanopore methods for DNA detection and sequencing, and describes processes for the manipulation and deposition of single biomolecules. One chapter is devoted to biological applications of scanning transmission electron microscopy (STEM).

Powerful tools for biomedical research can be built by combining nanotechnology and optics. Several chapters in the book address this bio-nanophotonics aspect by discussing optical nanosensors and nanoprobes, and observations of single molecules in cells by optical spectroscopy. Particular emphasis is given to plasmonics-based approaches, in chapters on topics that range from sensing of biomolecules by surface plasmon resonances to nanoscale imaging of biomolecules using near-field scanning optical microscopy, and to cellular imaging and gene detection using surface-enhanced Raman spectroscopy (SERS), a method described in Section II of the book. This second section is intended to focus more on applications. Some more general chapters in Section II are entitled "Nanoparticles in Medical Diagnostics and Therapeutics", "Nanotechnologies in Adult Stem Cell Research", and "Integrated Cantilever Based Biosensors for the Detection of Chemical and Biological Entities". Other chapters in Section II cover topics such as bioconjugation of nanoparticles, techniques for monitoring apoptosis and anticancer drug activity, the use of quantum dots as tracers for DNA electrochemical sensing systems, and the role of carbon nanotubes in bio-electrochemistry.

Individual chapters in the book are between 10 and 25 pages in length. In most cases, they are easily accessible and can be read as individual articles independently from each other. The arrangement of the chapters in two sections appears to be somewhat arbitrary, and sometimes the reader may even find it confusing. Section I of the book contains some interesting applications, while Section II also includes introductory chapters on nanomaterials, nanostructures, and nanotools. For example, nanoshells and carbon nanotubes are introduced in Section II.

Overall, this book with contributions by 96 authors from a broad range of disciplines is a valuable resource for everyone interested in this exciting interdisciplinary field, where nanotechnology and optics meet biology and medicine. As it gives detailed information about various sensing methods and analytical techniques, as well as extensive references, it will be useful for researchers and students who want to get started with their own projects based on nanotechnology approaches for addressing biological and medical questions.

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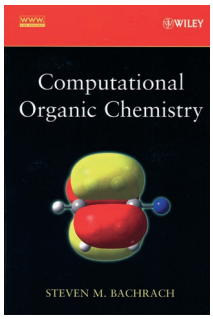
Computational Organic Chemistry



By *Steven M. Bachrach*. John Wiley & Sons, Hoboken 2007. 478 pp., hardcover € 97.90.—ISBN 978-0-471-71342-5

For any book on computational chemistry, or more generally on theoretical chemistry, it has to be decided at the outset whether it is to concentrate in detail on the fundamentals or on the applications. This dilemma arises because an attempt to cover both parts in detail inevitably results in a very thick book, which is often undesirable from the viewpoints of both the publisher and the author. In his book, Professor Bachrach has settled firmly on the side of applications. However, since the book also concentrates on certain topics where newer methods of calculation have revealed new aspects, there is also an additional focus, of a kind that one might not expect from the general-