

Biomedical Photonics Handbook, Second Edition: Therapeutics and Advanced Biophotonics (The Biomedical Photonics Handbook) (Volume 2)

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Shaped by Quantum Theory, Technology, and the Genomics Revolution

The integration of photonics, electronics, biomaterials, and nanotechnology holds great promise for the future of medicine. This topic has recently experienced an explosive growth due to the noninvasive or minimally invasive nature and the cost-effectiveness of photonic modalities in medical diagnostics and therapy. The second edition of the **Biomedical Photonics Handbook** presents recent fundamental developments as well as important applications of biomedical photonics of interest to scientists, engineers, manufacturers, teachers, students, and clinical providers. The third volume, **Therapeutics and Advanced Biophotonics**, focuses on therapeutic modalities, advanced biophotonic technologies, and future trends.

Represents the Collective Work of over 150 Scientists, Engineers, and Clinicians

Designed to display the most recent advances in instrumentation and methods, as well as clinical applications in important areas of biomedical photonics to a broad audience, this three-volume handbook provides an inclusive forum that serves as an authoritative reference source for a broad audience involved in the research, teaching, learning, and practice of medical technologies.

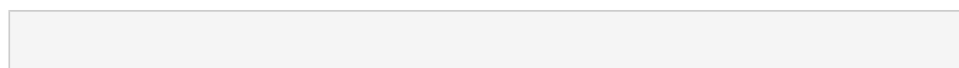
What's New in This Edition:

A wide variety of photonic biochemical sensing technologies has already been developed for clinical monitoring of early disease states and physiological parameters, such as blood pressure, blood chemistry, pH, temperature, and the presence of pathological organisms or biochemical species of clinical importance. Advanced photonic detection technologies integrating the latest knowledge of genomics, proteomics, and metabolomics allow sensing of early disease states, thus revolutionizing the medicine of the future.

Nanobiotechnology has opened new possibilities for detection of biomarkers of disease, imaging single molecules and *in situ* diagnostics at the single-cell level. In addition to these state-of-the-art advancements, the second edition contains new topics and chapters including:

- Fiber Optic Probe Design
- Laser and Optical Radiation Safety
- Photothermal Detection
- Multidimensional Fluorescence Imaging
- Surface Plasmon Resonance Imaging
- Molecular Contrast Optical Coherence Tomography
- Multiscale Photoacoustics
- Polarized Light for Medical Diagnostics
- Quantitative Diffuse Reflectance Imaging
- Interferometric Light Scattering
- Nonlinear Interferometric Vibrational Imaging
- Nanoscintillator-Based Therapy
- SERS Molecular Sentinel Nanoprobes
- Plasmonic Coupling Interference Nanoprobes

Comprised of three books: **Volume I: Fundamentals, Devices, and Techniques; Volume II: Biomedical Diagnostics; and Volume III: Therapeutics and Advanced Biophotonics**, this second edition contains eight sections, and provides introductory material in each chapter. It also includes an overview of the topic, an extensive collection of spectroscopic data, and a list of references for further reading.



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Editorial Review

Review

"Excellent book! Sheds new, latest and important light on the field of biomedical photonics. The second edition has put together a comprehensive resource covering all aspects of photonics in the field of biomedicine under three volumes. The use of practical examples summarizing real-world examples by scientists and engineers allows a collective look into the current best practices. This book will be valuable to anyone seeking to understand the complexities of designing fiber optic instruments, techniques involved behind analysis, diagnostics nuances and therapeutic modalities. Students and practitioners will learn about the latest tools and techniques used by leading researchers, scientists and engineers. A great compilation of varied research fields in the area of Biophotonics. Especially, a great reference book as topics are effectively dealt in-depth with lots of citations after each chapter."

?Dr. Shanthi Prince, SRM University, India

"No one has, or ever will, attempt to create such a comprehensive text in this field. It is an enormous undertaking that we are all grateful to have, but would not want to do it ourselves."

?Christopher H. Contag, Stanford University, California, USA

"... extensive and comprehensive coverage, resulting in an additional two volumes of material in this new edition ... [containing] the latest research and technology in biomedical optics/photonics."

?Inci Cilesiz, Istanbul Technical University, Turkey

"I like the breadth of topics, particularly the fact that they cover fundamental issues as well as advanced research areas. ... exhaustive coverage of biomedical optics starting from the very basic fundamentals to a wide variety of cutting-edge concepts. This makes the text ideal for all levels of readers?from undergraduate students to senior researchers."

?Kartikeya Murari, University of Calgary, Alberta, Canada

"... written in a clear language providing an easy transaction from the basic and fundamental concepts to expert level topics. This approach makes these materials very suitable for academic purposes. ... an excellent reference book for the researcher, teacher, and student. It provides a detailed and up-to-date expert coverage of fundamental concepts and current biomedical photonics techniques and applications. It also addresses several frontier research topics and emergent technologies that will surely result in future applications."

?António Miguel Morgado, University of Coimbra, Portugal

"This handbook is a step ahead in the sense that it brings together the recent advances in various fields of biomedical photonics. [It] serves as a teaching reference as well as a research guide."

?Renu John, Indian Institute of Technology Hyderabad, Telangana

About the Author

Tuan Vo-Dinh is the R. Eugene and Susie E. Goodson Distinguished Professor of biomedical engineering, professor of chemistry, and director of the Fitzpatrick Institute for Photonics at Duke University. He received a B.S. in physics in 1970 from EPFL (Ecole Polytechnique Federal de Lausanne) in Lausanne and a Ph.D. in physical chemistry in 1975 from ETH (Swiss Federal Institute of Technology) in Zurich, Switzerland. Dr.

Vo-Dinh has authored over 350 publications in peer-reviewed scientific journals. He is the author of a textbook on spectroscopy and editor of 6 books. He has received numerous awards and holds over 37 U.S. and international patents.

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Maxine Lucas:

As people who live in typically the modest era should be upgrade about what going on or information even knowledge to make all of them keep up with the era that is certainly always change and make progress. Some of you maybe will certainly update themselves by reading through books. It is a good choice for you personally but the problems coming to an individual is you don't know what type you should start with. This Biomedical Photonics Handbook, Second Edition: Therapeutics and Advanced Biophotonics (The Biomedical Photonics Handbook) (Volume 2) is our recommendation so you keep up with the world. Why, because book serves what you want and want in this era.

Floyd Goshorn:

Reading can called imagination hangout, why? Because while you are reading a book specifically book entitled Biomedical Photonics Handbook, Second Edition: Therapeutics and Advanced Biophotonics (The Biomedical Photonics Handbook) (Volume 2) your thoughts will drift away trough every dimension, wandering in each and every aspect that maybe not known for but surely can become your mind friends. Imaging each and every word written in a guide then become one application form conclusion and explanation that maybe you never get prior to. The Biomedical Photonics Handbook, Second Edition: Therapeutics and Advanced Biophotonics (The Biomedical Photonics Handbook) (Volume 2) giving you one more experience more than blown away your brain but also giving you useful information for your better life on this era. So now let us demonstrate the relaxing pattern at this point is your body and mind is going to be pleased when you are finished studying it, like winning an activity. Do you want to try this extraordinary shelling out spare time activity?

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