



Fluorescence Lifetime Spectroscopy and Imaging: Principles and Applications in Biomedical Diagnostics

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During the past two decades, there has been an increasing appreciation of the significant value that lifetime-based techniques can add to biomedical studies and applications of fluorescence. Bringing together perspectives of different research communities, **Fluorescence Lifetime Spectroscopy and Imaging: Principles and Applications in Biomedical Diagnostics** explores the remarkable advances in time-resolved fluorescence techniques and their role in a wide range of biological and clinical applications.

Broadly accessible, the book captures the state-of-the-art of fluorescence lifetime metrology and imaging and provides current perspectives on their applications to biomedical studies of intact tissues and medical diagnosis. The text introduces these techniques within the wider context of fluorescence spectroscopy and describes basic principles underlying current instrumentation for fluorescence lifetime imaging and metrology (FLIM). It also covers the wide range of methods, including single channel (point) spectroscopy, fluorescence lifetime imaging microscopy, and single- and multi-photon excitation.

Edited by pioneers in this field, with contributions from leading experts, the book includes an overview of complementary techniques that help researchers beginning FLIM research. It offers a comprehensive treatment of fundamental principles, instrumentation, analytical methods, and applications. It also provides an overview of the label-free contrast available from lifetime measurements of tissue autofluorescence and the prospects for exploiting this for clinical applications and biomedical research including drug discovery.

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Editorial Review

Review

"This highly recommended comprehensive volume is a good resource for investigators who wish to apply these techniques. It is a self-contained book in which the physics and the analytical methods are carefully worked out in detail. ... The discussions of fluorescence, the design and use of lifetime instrumentation, the various methods to analyze the data, and the biomedical applications are all current and well-illustrated."
Optics & Photonics News (OPN), October 2014

"... a timely and comprehensive review of the state of the art by internationally leading experts in the field. It provides excellent coverage of the basic principles, as well as a thorough appraisal of the latest methods and applications. The book represents a major resource for researchers, students, and technologists."
Jem Hebden, Ph.D., Professor and Head, Department of Medical Physics and Bioengineering, University College London

"This book provides comprehensive coverage on key aspects of fluorescence lifetime imaging, an emerging technique for life sciences and clinical diagnosis. The instrumentation and analysis sections include both well-known techniques and recent developments."
Dr. Qiyin Fang, Associate Professor of Engineering Physics, McMaster University

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