

Springer Series on Fluorescence
Methods and Applications

B. Valeur · J.-C. Brochon (Eds.)

New Trends in Fluorescence Spectroscopy

Applications
to Chemical and
Life Sciences



Springer

Bernard Valeur · Jean-Claude Brochon (Eds.)

New Trends in Fluorescence Spectroscopy

Applications to Chemical
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Preface

Fluorescence is more and more widely used as a tool of investigation, analysis, control and diagnosis in many fields relevant to physical, chemical, biological and medical sciences. New technologies continuously emerge thanks to the progress in the design of light sources (e.g. laser diodes), detectors (3D, 4D) and compact ultrafast electronic devices. In particular, much progress has been made in time-resolved fluorescence microscopy (FLIM: Fluorescence Lifetime Imaging Microscopy; FCS: Fluorescence Correlation Spectroscopy). Furthermore, the sensitivity now allows one to detect a single molecule in the restricted field of a confocal microscope, which actually offers the possibility to study phenomena at a molecular level.

The development of new fluorescent probes is still a necessity. In particular, the growing use of lasers implies high resistance to photodegradation. Fluorescence emission at long wavelengths is also a distinct advantage. Furthermore, *in vivo* inclusion of new fluorescent aromatic residues in proteins offer new potentialities in biology.

Fluorescence-based selective detection of ions and molecules is still the object of special attention. Considerable effort is being made in the design of supramolecular systems in which the recognition event is converted into a fluorescence signal easily detected. New fluorescent sensors for clinical diagnosis and detection of pollutants in atmosphere and water are extensively developed.

All these developments justify the regular publication of books giving the state-of-the-art of the methods and applications of fluorescence spectroscopy.

The present book collects articles written by invited speakers (and other participants upon invitation) at the 6th International Conference on Methods and Applications of Fluorescence Spectroscopy (MAFS-6), held in Paris, France, in September 1999. It is the aim of this series of conferences to bring together researchers working in various fields which employ fluorescence as a tool of investigation for both fundamental and applied purposes. Applications in chemistry, physics, biology and medicine were covered. The presentations as well as the number of participants (more than 300 from 32 countries) reflected the ever-growing interest in fluorescence and showed the rise of new methodologies.

Attention was paid in this meeting – and in this book as well – to retain the balance between basic science and applied science, and between physicochemical sciences and life sciences. An original aspect of this meeting was the short opening session devoted to great characters in the history of fluorescence. We have considered that it is worth including the relevant articles in the present book. It is indeed important to know not only where we are going to but also where we are coming from.

The book is divided into the following sections:

- I Historical Aspects of Fluorescence
- II Fluorescence of Molecular and Supramolecular Systems
- III Fluorescence in Sensing Applications
- IV New Techniques of Fluorescence Microscopy in Biology
- V Proteins and Their Interactions as Studied by Fluorescence Methods

We hope that this book will provide a useful tool for scientists working in academic institutions and industry. The relevance to very different areas should inspire researchers to use technologies and/or methodologies that are already employed in fields other than theirs.

Paris, January 2001

Bernard Valeur,
Jean-Claude Brochon

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