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Nota di contenuto	Part I - Fluorescence Spectroscopy: Basics and Advanced Approaches -- Chapter 1 Choosing the right fluorescent probe -- Chapter 2 Fluorescence kinetics and time-resolved measurement -- Chapter 3 Quantitative Approach to Applications of Electronic Energy Transfer (EET) -- Chapter 4 Single-molecule FRET: principles and analysis -- Chapter 5 Principles of fluorescence correlation and dual-color cross-correlation spectroscopy -- Part II - Fluorescence Microscopy: Basics and Advanced Approaches -- Chapter 6 Introduction to Fluorescence Microscopy -- Chapter 7 Wohland STED and RESOLFT fluorescent nanoscopy -- Chapter 8 Fluorescence Correlation Spectroscopy in Space and Time -- Part C - Applications of Fluorescence Spectroscopy and Microscopy to biological membranes -- Chapter 9 Determination of Biomolecular Oligomerization in the Live Cell Plasma Membrane via Single-molecule Brightness and Co-localization Analysis -- Chapter 10 Quantitative photoactivated localization microscopy of membrane receptor oligomers -- Chapter 11 Diffusion measurements at the nanoscale with STED-FCS -- Chapter 12 Single molecule microscopy methods to study mitochondrial processes -- Chapter 13 Transient state (TRAST) spectroscopy and imaging – exploiting the rich information source of fluorophore dark state transitions in

biomolecular and cellular studies -- Chapter 14 The analysis of in-membrane nanoscopic aggregation of lipids and proteins by MC-FRET -- Part D - Applications of Fluorescence Spectroscopy to protein studies -- Chapter 15 Single-molecule fluorescence spectroscopy of intrinsically disordered proteins -- Chapter 16 Insights into the conformational dynamics of potassium channels using homo-FRET approaches -- Chapter 17 Intrinsic fluorescence kinetics in proteins -- Chapter 18 Dynamics and hydration of proteins viewed by fluorescence methods: investigations favor protein engineering and synthetic biology.

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## Sommario/riassunto

This book provides the reader with an updated comprehensive view of the rapidly developing and fascinating field of fluorescence spectroscopy and microscopy. In recent years, fluorescence spectroscopy and microscopy have experienced rapid technological development, which has enabled the detection and monitoring of single molecules with high spatial and temporal resolution. Thanks to these developments, fluorescence has become an even more popular method in physical, biological and related fields. This book guides the reader through both basic and advanced fluorescence spectroscopy and microscopy approaches with a focus on their applications in membrane and protein biophysics. Each of the four parts: A - Fluorescence Spectroscopy, B - Fluorescence Microscopy, C - Applications of Fluorescence Spectroscopy and Microscopy to biological membranes and D - Applications of Fluorescence Spectroscopy to protein studies are written by experts within the field. The book is intended for both complete beginners who want to quickly orient themselves in the large number of existing fluorescent methods, as well as for advanced readers who are interested in particular methods and their proper use. .

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