

VIBRATIONAL SPECTROSCOPY IN PROTEIN RESEARCH

From Purified Proteins to Aggregates and Assemblies

Edited by

Yukihiro Ozaki, Professor Emeritus, School of Science and Technology, Kwansei Gakuin University, Hyogo, Japan

Malgorzata Baranska, Professor, Faculty of Chemistry & Jagiellonian Centre for Experimental Therapeutics (JCET), Jagiellonian University, Krakow, Poland

Igor K. Lednev, Professor, Department of Chemistry, University at Albany, State University of New York, Albany, NY, United States

Bayden R. Wood, Professor, Director, Centre for Biospectroscopy, School of Chemistry, Monash University, Clayton, VIC, Australia

In recent years, a range of new, state-of-the-art vibrational spectroscopic techniques have been developed, including Raman imaging, Raman optical activity (ROA), SERS, TERS, nonlinear Raman spectroscopy, AFM-IR, cascade laser IR spectroscopy, IR imaging, NIR imaging, Terahertz spectroscopy, and time-resolved vibrational spectroscopy. In addition, spectral analysis methods, such as chemometrics and quantum chemical calculation, are now seeing wider use by researchers across the biomedical and life sciences.

Vibrational Spectroscopy in Protein Research: From Purified Proteins to Aggregates and Assemblies offers a thorough discussion of vibrational spectroscopy in protein research, providing researchers with clear, practical guidance on methods employed, areas of application, and modes of analysis. With chapter contributions from international leaders in the field, the book addresses basic principles of vibrational spectroscopy in protein research, instrumentation and technologies available, sampling methods, quantitative analysis, origin of group frequencies, and qualitative interpretation. In addition to discussing vibrational spectroscopy for analysis of purified proteins, chapter authors also examine use in studying complex protein systems, including protein aggregates, fibrous proteins, membrane proteins, and protein assemblies.

Emphasis throughout is placed on applications in human tissue, cell development, and disease analysis, with chapters dedicated to studies of molecular changes that occur during disease progression, as well as identifying changes in tissues and cells in disease studies.

Key Features

- Provides thorough guidance in implementing cutting-edge vibrational spectroscopic methods from international leaders in the field
- Emphasizes in vivo, in situ, and noninvasive analysis of proteins in biological systems, and is broadly applicable
- Chapters address vibrational spectroscopy for the study of not only simple proteins, but also protein aggregates, fibrous proteins, membrane proteins, and protein assemblies

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