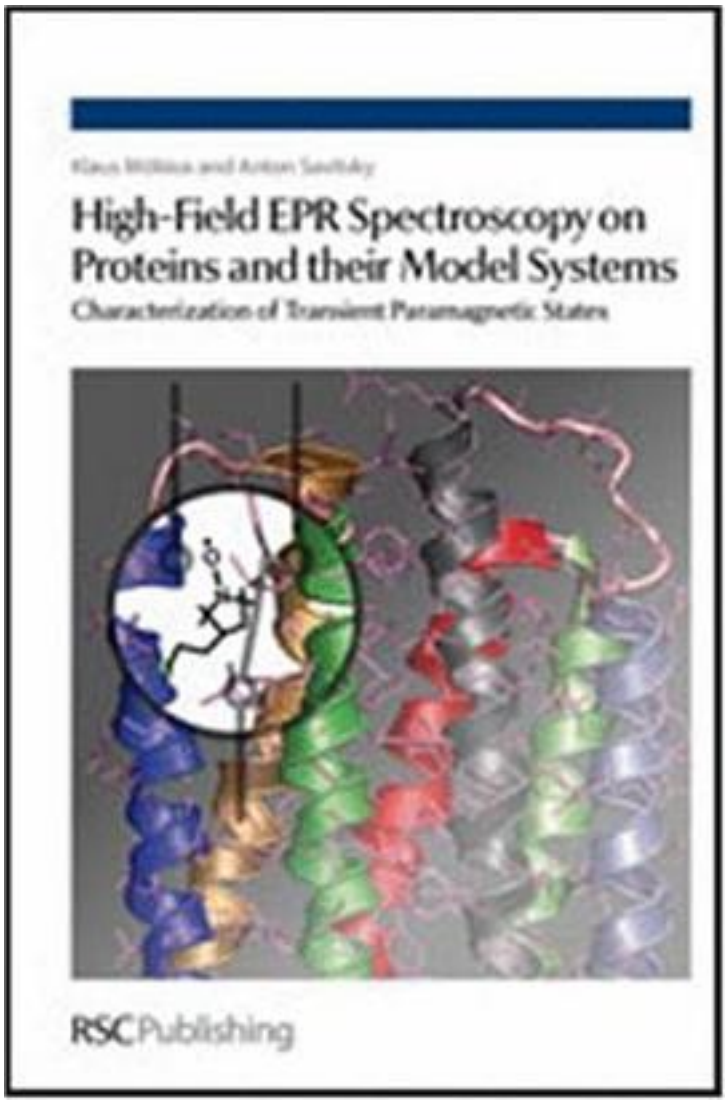
High-Field EPR Spectroscopy on Proteins and their Model Systems



High-Field EPR Spectroscopy on Proteins and their Model Systems_下载链接1_

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Understanding the major factors determining the specificity of transmembrane transfer processes in proteins is currently a hot topic in molecular bio-science. Advanced electron paramagnetic resonance (EPR) at high magnetic fields is a powerful technique for characterizing the transient states of proteins in action on biologically relevant time scales. This book offers a comprehensive overview of experimental techniques in, and paradigmatic examples of, the application of high-field EPR spectroscopy in biology and chemistry. It focuses on the use of the technique in conjunction with site-specific mutation strategies and advanced quantum-chemical computation methods to reveal protein structure and dynamics. This yields new insights into biological processes at the atomic and molecular level. The theoretical and instrumental background of high-field EPR is described and examples of paradigmatic protein systems, such as photosynthesis, are discussed in the light of recent investigations. Aspects of structure-dynamics-function relations that are revealed by studying site-specific mutants are highlighted, thereby combining high-field EPR with genetic engineering techniques. The information obtained complements that obtained from protein crystallography, solid-state NMR, infrared and optical spectroscopy. The book documents both background knowledge and results of the latest research in the field. Unique features include comparisons of information content of EPR, ENDOR, Triple resonance, ESEEM and PELDOR taken at different microwave frequencies and magnetic fields. Coherent treatment of the subject by the leading Berlin high-field EPR laboratory covers the theoretical background as well as state-of-art research both in terms of instrumentation and application to biological systems. Finally, the book provides an outlook to future developments and references for further reading. High-Field EPR Spectroscopy on Proteins in Action is essential reading for scientists, professionals, academics and post graduate students working in this field.

作者介绍:

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书评

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