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| Altri autori (Persone)  | EylesStephen J  |
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| Nota di contenuto       | MASS SPECTROMETRY IN BIOPHYSICS; CONTENTS; Preface; 1 General Overview of Basic Concepts in Molecular Biophysics; 1.1. Covalent Structure of Biopolymers; 1.2. Noncovalent Interactions and Higher-order Structure; 1.2.1. Electrostatic Interaction; 1.2.2. Hydrogen Bonding; 1.2.3. Steric Clashes and Allowed Conformations of the Peptide Backbone: Secondary Structure; 1.2.4. Solvent-Solute Interactions, Hydrophobic Effect, Side Chain Packing, and Tertiary Structure; 1.2.5. Intermolecular Interactions and Association: Quaternary Structure; 1.3. The Protein Folding Problem 1.3.1. What Is Protein Folding? 1.3.2. Why Is Protein Folding So Important; 1.3.3. What Is the Natively Folded Protein and How Do We Define a Protein Conformation?; 1.3.4. What Are Non-native Protein Conformations? Random Coils, Molten Globules, and Folding Intermediates; 1.3.5. Protein Folding Pathways; 1.4. Protein Energy Landscapes and the Folding Problem; 1.4.1. Protein Conformational |

Ensembles and Energy Landscapes: Enthalpic and Entropic Considerations; 1.4.2. Equilibrium and Kinetic Intermediates on the Energy Landscape; 1.5. Protein Dynamics and Function 1.5.1. Limitations of the Structure-Function Paradigm 1.5.2. Protein Dynamics Under Native Conditions; 1.5.3. Biomolecular Dynamics and Binding from the Energy Landscape Perspective; 1.5.4. Energy Landscapes Within a Broader Context of Nonlinear Dynamics: Information Flow and Fitness Landscapes; References; 2 Overview of "Traditional" Experimental Arsenal to Study Biomolecular Structure and Dynamics; 2.1. X-Ray Crystallography; 2.1.1. Fundamentals; 2.1.2. Crystal Structures at Atomic and Ultrahigh Resolution; 2.1.3. Crystal Structures of Membrane Proteins 2.1.4. Protein Dynamics and X-Ray Diffraction 2.2. Solution Scattering Techniques; 2.2.1. Static and Dynamic Light Scattering; 2.2.2. Small-Angle X-Ray Scattering; 2.2.3. Cryo-Electron Microscopy; 2.2.4. Neutron Scattering; 2.3. NMR Spectroscopy; 2.3.1. Heteronuclear NMR; 2.3.2. Hydrogen Exchange by NMR; 2.4. Other Spectroscopic Techniques; 2.4.1. Cumulative Measurements of Higher Order Structure: Circular Dichroism; 2.4.2. Vibrational Spectroscopy; 2.4.3. Fluorescence: Monitoring Specific Dynamic Events; 2.5. Other Biophysical Methods to Study Macromolecular Interactions and Dynamics 2.5.1. Calorimetric Methods 2.5.2. Analytical Ultracentrifugation; 2.5.3. Surface Plasmon Resonance; 2.5.4. Gel Filtration; 2.5.5. Gel Electrophoresis; References; 3 Overview of Biological Mass Spectrometry; 3.1. Basic Principles of Mass Spectrometry; 3.1.1. Stable Isotopes and Isotopic Distributions; 3.1.2. Macromolecular Mass: Terms and Definitions; 3.2. Methods of Producing Biomolecular Ions; 3.2.1. Macromolecular Ion Desorption Techniques: General Considerations; 3.2.2. Electrospray Ionization; 3.2.3. Matrix Assisted Laser Desorption/Ionization; 3.3. Mass Analysis 3.3.1. General Considerations:  $m/z$  Range and Mass Discrimination, Mass Resolution, Duty Cycle, Data Acquisition Rate

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## Sommario/riassunto

The first systematic summary of biophysical mass spectrometry techniques Recent advances in mass spectrometry (MS) have pushed the frontiers of analytical chemistry into the biophysical laboratory. As a result, the biophysical community's acceptance of MS-based methods, used to study protein higher-order structure and dynamics, has accelerated the expansion of biophysical MS. Despite this growing trend, until now no single text has presented the full array of MS-based experimental techniques and strategies for biophysics. *Mass Spectrometry in Biophysics* expertly closes this gap i

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