

1. Record Nr.	UNINA9910830762703321
Autore	Kaltashov Igor A.
Titolo	Mass spectrometry in structural biology and biophysics : architecture, dynamics, and interaction of biomolecules // Igor A. Kaltashov, Stephen J. Eyles
Pubbl/distr/stampa	Hoboken, New Jersey : , : Wiley, , 2012 ©2012
ISBN	1-280-59028-9 9786613620118 1-118-23211-9 1-118-23212-7
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (312 p.)
Collana	Wiley series on mass spectrometry
Disciplina	610.28/4 610.284
Soggetti	Mass spectrometry Biophysics Biomolecules - Spectra
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	MASS SPECTROMETRY IN STRUCTURAL BIOLOGY AND BIOPHYSICS: Architecture, Dynamics, and Interaction of Biomolecules; CONTENTS; Preface to the Second Edition; Preface to the First Edition; 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 Is Well-Defined Structure Required for Functional Competence?; 1.5.4 Biomolecular Dynamics and Binding from The Energy Landscape Perspective; 1.5.5 Energy Landscapes Within a Broader Context of Nonlinear Dynamics: Information Flow and Fitness Landscapes; 1.6 Protein Higher Order Structure and Dynamics from A Biotechnology Perspective; 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 Size Exclusion Chromatography (Gel Filtration); 2.5.5 Electrophoresis; 2.5.6 Affinity Chromatography; 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

---

## Sommario/riassunto

The definitive guide to mass spectrometry techniques in biology and biophysics. The use of mass spectrometry (MS) to study the architecture and dynamics of proteins is increasingly common within the biophysical community, and *Mass Spectrometry in Structural Biology and Biophysics: Architecture, Dynamics, and Interaction of Biomolecules, Second Edition* provides readers with detailed, systematic coverage of the current state of the art. Offering an unrivalled overview of modern MS-based armamentarium that can be used to solve the most challenging problems in biophysics, structural biology

---