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| Nota di contenuto | Contents; CHAPTER 1 Introduction; 1 The Electron Microscope and Biology; 1.1 General Remarks; 1.2 Three-Dimensional Electron Microscopy; 2 Single-Particle Versus Crystallographic Analysis; 3 Crystallography without Crystals; 4 Toward a Unified Approach to Structural Analysis of Macromolecules; 5 Single-Particle Reconstruction, Macromolecular Machines, and Structural Proteomics; 6 The Electron Microscope and the Computer; CHAPTER 2 Electron Microscopy of Macromolecular Assemblies; 1 Principle of the Transmission Electron Microscope; 2 Specimen Preparation Methods; 2.1 Introduction 2.2 Negative Staining2.3 Glucose Embedment; 2.4 Use of Tannic Acid; 2.5 Ice-Embedded Specimens; 2.6 Hybrid Techniques: Cryo-Negative Staining; 2.7 Labeling with Gold Clusters; 2.8 Support Grids; 3 Principle of Image Formation in the Transmission Electron Microscope; 3.1 Introduction; 3.2 The Weak-Phase Object Approximation; 3.3 The Contrast Transfer Theory; 3.4 Amplitude Contrast; 3.5 Formulation of Bright-Field Image Formation Using Complex Atomic Scattering Amplitudes; 3.6 Optical and Computational Diffraction Analysis-The |

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| | Power Spectrum; 3.7 Determination of the Contrast Transfer Function 3.8 Instrumental Correction of the Contrast Transfer Function; 3.10 Locally Varying CTF and Image Quality; 4 Special Imaging Techniques and Devices; 4.1 Low-Dose Electron Microscopy; 4.2 Spot Scanning; 4.3 Energy Filtration; 4.4 Direct Image Readout and Automated Data Collection; CHAPTER 3 Two-Dimensional Averaging Techniques; 1 Introduction; 1.1 The Different Sources and Types of Noise; 1.2 Principle of Averaging: Historical Notes; 1.3 Equivalence between Averaging and Quasi-Optical Fourier Filtration 1.4 A Discourse on Terminology: Views Versus Projections1.5 The Role of Two-Dimensional Averaging in the Three-Dimensional Analysis of Single Molecules; 1.6 Origins of Orientational Preferences; 2 Digitization and Selection of Particles; 2.1 Hardware for Digitization; 2.2 The Sampling Theorem; 2.3 Interactive Particle Selection; 2.4 Automated Particle Selection; 3 Alignment Methods; 3.1 Quantitative Definitions of Alignment; 3.2 Homogeneous Versus Heterogeneous Image Sets; 3.3 Translational and Rotational Cross-Correlation; 3.4 Reference-Based Alignment Techniques 3.5 Reference-Free Alignment Techniques (5.3 Resolution; 5.1 The Statistical Significance; 4.3 Signal-to-Noise Ratio; 5 Resolution; 5.1 The Concept of Resolution; 5.2 Resolution Criteria; 5.3 Resolution; 5.1 The Concept of Resolution; 5.2 Resolution Criteria; 5.3 Resolution; 5.1 The Concept of Resolution; 5.2 Resolution Criteria; 5.6 Noise Filtering; 6 Validation of the Average Image; CHAPTER 4 Multivariate Data Analysis and Classification of Images; 1 Introduction 1.1 Heterogeneity of Image Sets |
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| Sommario/riassunto | 1. Introduction2. Electron Microscopy of Macromolecular Assemblies3. Two-Dimensional Averaging Techniques4. Multivariate Data Analysis and Classification of Images5. Three-Dimensional Reconstruction6. Interpretation of Three-Dimensional Images of MacromoleculesAppendix 1: Some Important Definitions and TheoremsAppendix 2: Profiles, Point-Spread Functions, and Effects of Commonly Used Low-Pass FiltersAppendix 2: Bibliography of MethodsAppendix 2: Bibliography of StructuresAppendix 2: Special Journal Issues on Image Processing Techniques |