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| Nota di contenuto | Opportunities in Biology; Copyright; Acknowledgments; Preface; Contents; Executive Summary; THE NEW BIOLOGY; STRUCTURAL BIOLOGY; GENES AND CELLS; DEVELOPMENT; THE NERVOUS SYSTEM AND BEHAVIOR; THE IMMUNE SYSTEM AND INFECTIOUS DISEASES; EVOLUTION, SYSTEMATICS, AND ECOLOGY; PLANT BIOLOGY AND AGRICULTURE; INFRASTRUCTURE OF BIOLOGY RESEARCH AND RECOMMENDATIONS; Training; Equipment and Facilities; Funding; Information Science and Collections; International Cooperation; 1 The New Biology; DIVISIONS BETWEEN TRADITIONAL DISCIPLINES ARE BEING REMOVED; 2 New Technologies and Instrumentation RECOMBINANT DNA TECHNIQUESRecombinant DNA Techniques Permit us to Isolate a Single Gene From the Tens of Thousands Encoded in a Complex Genome; Transformation of Higher Organisms; Biologists Can Specifically Insert a Functioning Gene Into the Genome of Complex Organisms; Making a Transgenic Animal; A Transgenic Animal is |

Produced Initially by a Combination of Microsurgery And Embryological Techniques; Transgenic Mice Have Been Used For a Variety of Experiments; Creating Transgenic Plants; The Creation of Transformed Plants Has Been one of The Most Exciting Developments in Modern Biology

Future Prospects The Potential for Using Transgenic Organisms to Make Discoveries Over the Next 5 or 10 Years Is Vast; MONOCLONAL ANTIBODIES; Monoclonal Antibodies Can be Used as Biological Probes For Specific Molecules; MICROCHEMICAL TECHNIQUES; Microchemical Instrumentation Has Had a Powerful Impact on Modern Biology That is Just Beginning to be Felt; FLOW CYTOMETRY; Flow Cytometry is Used to Sort Cells; MICROSCOPY; A Revolution in the Application of Light Microscopy Has Occurred; Video-Enhanced Contrast Microscopy Video-Enhanced Contrast Microscopy Combines the Technologies of Modern Light Microscopy, Video Imaging, and Digital Image...Low-Light-Dose Microscopy; Coupling Biological Chemistry with Advanced Image Processing Has Permitted Low-Light-Dose Microscopy to Evolve as an...; Scanning Acoustic Microscope; The Scanning Acoustic Microscope Measures the Elastic Properties of the Cell; Scanning Tunneling and Atomic Force Microscope; The Scanning Tunneling Microscope Allows One to Image Surfaces with the Resolution of a Few Angstroms

The Atomic Force Microscope Holds Great Promise for Analyzing Biological Specimens MAGNETIC RESONANCE; Magnetic Resonance Spectroscopy is Becoming an Invaluable Tool for Determining the Structures of Complex Molecules; COMPUTERS AND DATA ANALYSIS; Computers are Coming to Play an Central Role in Modern Biology; BIOLOGY AND THE FUTURE; Synergistic Interactions of the New Biology Have Shortened the Time Between Fundamental Observations and Applications; 3 Molecular Structure and Function; Biological Macromolecules are Machines
The Main Theme of Structural Biology Is the Relation of Molecular Structure to Function

Sommario/riassunto

Biology has entered an era in which interdisciplinary cooperation is at an all-time high, practical applications follow basic discoveries more quickly than ever before, and new technologies--recombinant DNA, scanning tunneling microscopes, and more--are revolutionizing the way science is conducted. The potential for scientific breakthroughs with significant implications for society has never been greater. Opportunities in Biology reports on the state of the new biology, taking a detailed look at the disciplines of biology; examining the advances made in medicine, agriculture, and other fields; and pointing out promising research opportunities. Authored by an expert panel representing a variety of viewpoints, this volume also offers recommendations on how to meet the infrastructure needs--for funding, effective information systems, and other support--of future biology research. Exploring what has been accomplished and what is on the horizon, Opportunities in Biology is an indispensable resource for students, teachers, and researchers in all subdisciplines of biology as well as for research administrators and those in funding agencies.
