

1. Record Nr.	UNINA9910965521103321
Titolo	Mapping and sequencing the human genome // Committee on Mapping and Sequencing the Human Genome, Board on Basic Biology, Commission on Life Sciences, National Research Council
Pubbl/distr/stampa	Washington, D.C., : National Academy Press, 1988
ISBN	9786610214983 9781280214981 1280214988 9780309535007 030953500X 9780585149172 0585149178
Edizione	[1st ed.]
Descrizione fisica	1 online resource (128 p.)
Disciplina	573.2/12
Soggetti	Human gene mapping Gene mapping
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Mapping and Sequencing the Human Genome -- Copyright -- Preface -- Contents -- MAPPING AND SEQUENCING THE HUMAN GENOME -- 1 Executive Summary -- GENOME MAPPING -- GENOME SEQUENCING -- INFORMATION AND MATERIALS HANDLING -- IMPLEMENTATION STRATEGIES -- MANAGEMENT STRATEGY -- 2 Introduction -- GENOMES, GENES, AND GENOMIC MAPS -- Genomes Consist of DNA Molecules That Contain Many Genes -- The Human Genome Is Composed of 24 Different Types of DNA Molecules -- The Human Genome Can Be Mapped in Many Different Ways -- MEDICAL IMPLICATIONS OF DETAILED HUMAN GENOME MAPS -- IMPLICATIONS FOR BASIC BIOLOGY -- EXPECTED GECHNOLOGICAL DEVELOPMENTS GENERATED BY A HUMAN GENOME PROJECT AND THEIR IMPACT ON BIOLOGICAL RESEARCH -- IMPACT ON THE RESEARCH BY SMALL GROUPS -- REFERENCES -- 3 Implications for Medicine and Science -- MEDICAL USES -- A Map of the Human Genome Will Greatly Facilitate

the Identification of Specific Disease Genes -- Disease Genes Promise to Provide Important Insights into Human Biology -- Specific Medical Applications -- Toward an Understanding of Cancer -- IMPLICATIONS FOR BASIC BIOLOGY -- What Aspects of Genome Organization Are Important for Genome Function? -- Many New Human Genes and Proteins Will Be Identified -- How Do Organisms Evolve? -- References -- 4 Mapping -- Early Cytological Mapping Efforts Depended on Examining Chromosomes Under the Light Microscope -- The Current Revolution in Genome Mapping Is Based on the Use of Recombinant-DNA Techniques -- FUNDAMENTALS OF GENOME MAPPING -- Physical Maps Describe Chromosomal DNA Molecules, Whereas Genetic Linkage Maps Describe Patterns of Inheritance -- The Development of Ordered Collections of DNA Clones Is an Important -- Both Physical and Genetic Linkage Maps Can Be Constructed with Various Degrees of Resolution and Connectivity -- GENETIC LINKAGE MAPPING.

Restriction Fragment Length Polymorphisms Are Convenient Landmarks for Genetic Linkage Mapping -- Genetic Linkage Mapping Requires the Study of Many People in Large Family Groups -- RFLPs Are Useful for Interrelating Physical and Genetic Linkage Maps -- A Reference RFLP Map for the Human Would Be a Critical Tool for Studying Inherited Diseases -- MAKING PHYSICAL MAPS -- Medium-Resolution Mapping of Restriction Sites Is Facilitated by New Methods of Preparing and Separating Large DNA Molecules -- High-Resolution Mapping of Restriction Sites Will Require the Use of Ordered Collections of DNA Clones -- Fingerprinting Methods Can Be Used to Order DNA Clones -- The Optimal Method for Preparing Ordered Collections of DNA Clones Is Not Yet Clear -- IMMEDIATE APPLICATIONS OF CHROMOSOME MAPS -- CONCLUSIONS AND RECOMMENDATIONS -- Recent Breakthroughs Have Set the Stage for Large-Scale Mapping -- Different Mapping Methods Should Proceed in Parallel -- The Improvement of Physical Mapping Techniques Should Be Closely Coupled to Actual Attempts to Map Large Genomes -- Specific Improvements That Will Facilitate Map Construction and Usefulness Can Be Identified -- REFERENCES -- 5 Sequencing -- WHY SEQUENCE THE ENTIRE HUMAN GENOME? -- CURRENT TECHNOLOGY IN DNA SEQUENCING: CHEMICAL AND ENZYMIC METHODS -- THE DIFFICULTY OF DETERMINING THE SEQUENCE OF THE HUMAN GENOME WITH CURRENT TECHNOLOGY -- THE ACCURACY OF DNA SEQUENCING -- EMERGING AND FUTURE TECHNOLOGY -- OPTIONS AND RECOMMENDATIONS -- The Project Should Begin with Two Kinds of Studies -- To Derive the Full Benefit of the Human Genome Sequence Will Require Many New Tools, Including a Comprehensive Database... -- DNA Sequence Determinations Require Quality Control -- REFERENCES -- 6 The Collection, Analysis, and Distribution of Information and Materials -- PRESENT INFORMATION-HANDLING ORGANIZATIONS -- GenBank/EMBL.

Mendelian Inheritance in Man -- Human Gene Mapping Library -- Centre d'Etude du Polymorphisme Humain -- MAPPING DATA BASES REQUIRED FOR A HUMAN GENOME PROJECT -- The Collaborative Facilities Needed To Generate an RFLP Map Must Be Expanded -- All Human Map Data Should Be Accessible from a Single Data Base -- A Material Collection and Distribution Facility for Ordered Sets of Cloned DNA Fragments Will Be an Important First Stage in... -- A DNA SEQUENCE DATA BANK DEDICATED TO A HUMAN GENOME PROJECT -- A Concerted Initiative Aimed at Determining the Sequence of the Human Genome Will Generate Large Amounts of DNA Sequence Data -- All Data Must Be Entered Electronically or Magnetically -- An Initial Analysis Should Be Performed by a Central Facility -- An Example of an Initial Sequence Analysis -- Establishing an Efficient Computer Network

-- The Need for Research on Data Analysis -- The Estimated Cost -- CONCLUSIONS -- REFERENCES -- 7 Implementation and Management Strategies -- FUNDING A HUMAN GENOME PROJECT -- Projects with the Potential to Make Substantial Technological Improvements in Genome Analysis Should Receive Top Priority -- Both Small Research Laboratories and Larger Multidisciplinary Centers Should Be Encouraged -- The Establishment of a Single Large Production Center is Not Advisable at Present -- Decisions for Funding Should Be Made by Peer Review -- The Human Genome Project Requires New and Distinctive Funding of About 200 Million per Year -- Mapping Efforts Should Be Accelerated and Coordinated -- The Sequencing Effort Should Evolve and Grow with Time -- International Collaboration on the Project Is Desirable -- MANAGING A HUMAN GENOME PROJECT -- Three Possible Organizational Plans -- Organizational Plan A: A Lead Agency and a Scientific Advisory Board -- Organizational Plan B: An Interagency Committee and Scientific Advisory Board. Organizational Plan C: Interagency Committee, Administrative Agency, and Scientific Advisory Board -- REFERENCE -- 8 Implications for Society -- COMMERCIAL AND LEGAL IMPLICATIONS -- ETHICAL AND SOCIAL IMPLICATIONS -- Conducting a Genome Mapping and Sequencing Project -- Interpreting the Medical Implications of Genetic Information -- The Use and Abuse of a Complete Genome Map -- REFERENCES -- Appendix A Glossary -- Appendix B Curricula Vitae of Committee Members -- Appendix C Invited Speakers at Committee Meetings -- Index.

Sommario/riassunto

There is growing enthusiasm in the scientific community about the prospect of mapping and sequencing the human genome, a monumental project that will have far-reaching consequences for medicine, biology, technology, and other fields. But how will such an effort be organized and funded? How will we develop the new technologies that are needed? What new legal, social, and ethical questions will be raised? Mapping and Sequencing the Human Genome is a blueprint for this proposed project. The authors offer a highly readable explanation of the technical aspects of genetic mapping and sequencing, and they recommend specific interim and long-range research goals, organizational strategies, and funding levels. They also outline some of the legal and social questions that might arise and urge their early consideration by policymakers.
