1. Record Nr. UNINA9910830844403321

Autore	Cantor Charles R. <1942->
Titolo	Genomics [[electronic resource]] : the science and technology behind the human genome project / / Charles R. Cantor, Cassandra L. Smith
Pubbl/distr/stampa	New York, : John Wiley & Sons, c1999
ISBN	1-280-36704-0 9786610367047 0-470-32291-8 0-471-46186-5 0-471-22056-6
Descrizione fisica	1 online resource (621 p.)
Collana	Baker Lecture Series ; ; v.12
Altri autori (Persone)	SmithCassandra
Disciplina	572.8/6 572.86
Soggetti	DNA - Analysis Nucleotide sequence Gene mapping
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"A Wiley-Interscience publication."
Nota di bibliografia	Includes bibliographies and index.
Nota di contenuto	Contents; Preface; Introduction; 1 DNA Chemistry and Biology; Basic Properties of DNA; Covalent Structure; Double Helical Structure; Methylated Bases; Plasticity in DNA Structure; DNA Synthesis; DNA as a Flexible Set of Chemical Reagents; Basic DNA Biology; Genome Sizes; Number of Genes; Sources and Additional Readings; 2 A Genome Overview at the Level of Chromosomes; Basic Properties of Chromosomes; Bacterial Chromosomes; Chromosomes of Eukaryotic Organisms; Centromeres; Telomeres; Dynamic Behavior of Telomeres; Chromatin and the Higher-Order Structure of Chromosomes Chromosomes in the Cell CycleGenome Organization; Chromosome Purification; Chromosome Number; Unusual Characteristics of Sex Chromosomes and Mitochondria; Synteny; Sources and Additional Readings; 3 Analysis of DNA Sequences by Hybridization; Basic Requirements for Selectivity and Sensitivity; Detection of Specific DNA Sequences; Equilibria between DNA Double and Single Strands; Thermodynamics of the Melting of Short Duplexes; Thermodynamics of

Imperfectly Paired Duplexes; Kinetics of the Melting of Short Duplexes; Kinetics of Melting of Long DNA; Kinetics of Double-Strand Formation ComplexityHybridization on Filters; Sensitive Detection; Sources and Additional Readings; 4 Polymerase Chain Reaction and Other Methods for In Vitro DNA Amplification; Why Amplify DNA?; Basic Principles of the Polymerase Chain Reaction (PCR); Noise in PCR: Contamination; PCR Noise: Mispriming; Misincorporation; Long PCR; Incorporating Extra Functionalities; Single-Sided PCR; Reducing Complexity with PCR; Additional Variants of the Basic PCR Reaction; Total Genome Amplification Methods; Application of PCR to Detect Molecules Other Than DNA
DNA Amplification without Thermal Cycling and Other Alternatives to PCRFuture of PCR; Sources and Additional Readings; 5 Principles of DNA Electrophoresis; Physical Fractionation of DNA; Separation of DNA in the Ultracentrifuge; Electrophoretic Size Separations of DNA; Electrophoresis without Gels; Motions of DNA Molecules in Gels; Complex Effects of Gel Structure and Behavior; Biased Reptation Model of DNA Behavior in Gels; Pulsed Field Gel Electrophoresis (PFG); Macroscopic Behavior of DNA in PFG; Inadequacy of Reptation Models for PFG; DNA Trapping Electrophoresis
Secondary Pulsed Field Gel Electrophoresis (SPFG)Entry of DNAs into Gels; Sources and Additional Readings; 6 Genetic Analysis; Why We Need Genetics; Basic Strategy for Genetic Analysis in the Human: Linkage Mapping; A Glossary of Genetic Terms; Relationship between the Physical and the Genetic Maps; Power of Mouse Genetics; Weakness of Human Genetics; Linkage Analysis Ignoring Recombination; Linkage Analysis with Recombination; Interval Mapping; Finding Genes by Genetic Mapping; Moving from Weak Linkage Closer to a Gene; Linkage Disequilibrium
Complications in Linkage Disequilibrium and Genetic Maps in General

Sommario/riassunto

A unique exploration of the principles and methods underlying the Human Genome Project and modern molecular genetics and biotechnology-from two top researchers In Genomics, Charles R. Cantor, former director of the Human Genome Project, and Cassandra L. Smith give the first integral overview of the strategies and technologies behind the Human Genome Project and the field of molecular genetics and biotechnology. Written with a range of readers in mind-from chemists and biologists to computer scientists and engineers-the book begins with a review of the basic properties of DNA and the chromoso