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Calculations for Molecular Biology and Biotechnology - Frank H. Stephenson 2010-07-30

Calculations for Molecular Biology and Biotechnology: A Guide to Mathematics in the Laboratory, Second Edition, provides an introduction to the myriad of laboratory calculations used in molecular biology and biotechnology. The book begins by discussing the use of scientific notation and metric prefixes, which require the use of exponents and an understanding of significant digits. It explains the mathematics involved in making solutions; the characteristics of cell growth; the multiplicity of infection; and the quantification of nucleic acids. It includes chapters that deal with the mathematics involved in the use of radioisotopes in nucleic acid research; the synthesis of oligonucleotides; the polymerase chain reaction (PCR) method; and the development of recombinant DNA technology. Protein quantification and the assessment of protein activity are also discussed, along with the centrifugation method and applications of PCR in forensics and paternity testing. Topics range from basic scientific notations to complex subjects like nucleic acid chemistry and recombinant DNA technology. Each chapter includes a brief explanation of the concept and covers necessary definitions, theory and rationale for each type of calculation. Recent applications of the procedures and computations in clinical, academic, industrial and basic research laboratories are cited throughout the text. New to this Edition: Updated and increased coverage of real time PCR and the mathematics used to measure gene expression. More sample problems in every chapter for readers to practice concepts.

DNA Recombination and Repair - Paul James Smith 1999

The processes of DNA recombination and repair are vital to cell integrity - an error can lead to disease such as cancer. It is therefore a large and exciting area of research and is also taught on postgraduate and undergraduate courses. This book is not a comprehensive view of the field, but a selection of the issues currently at the forefront of knowledge.

Biomedical Politics - Institute of Medicine 1991-02-01

The abortifacient RU-486 was born in the laboratory, but its history has been shaped by legislators, corporate marketing executives, and protesters on both sides of the abortion debate. This volume explores how society decides what to do when discoveries such as RU-486 raise complex and emotional policy issues. Six case studies with insightful commentary offer a revealing look at the interplay of scientists, interest groups, the U.S. Congress, federal agencies, and the public in determining biomedical public policy and suggest how decision making might become more reasoned and productive in the future. The studies are fascinating and highly readable accounts of the personal interactions behind the headlines. They cover dideoxyinosine (ddI), RU-486, Medicare coverage for victims of chronic kidney failure, the human genome project, fetal tissue transplantation, and the 1975 Asilomar conference on recombinant DNA.

Agricultural Biotechnology - National Research Council (U.S.). Committee on a National Strategy for Biotechnology in Agriculture 1987-01-01

Executive summary and recommendations. Scientific aspects. Funding and institutions. Training. Technology transfer.

Mapping and Sequencing the Human Genome - National Research Council 1988-01-01

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.

ASM News - 2001

Molecular Methods for Virus Detection - Danny L. Wiedbrauk 1995-02-08

Molecular diagnostic procedures have been described in a number of recent books and articles. However, these publications have not focused on virus detection, nor have they provided practical protocols for the newer molecular methods. Written by the inventors or principal developers of these technologies, Molecular Methods for Virus Detection provides both reviews of individual methods and instructions for detecting virus nucleic acid sequences in clinical specimens. Each procedure includes quality assurance protocols that are often ignored by other methodology books. Molecular Methods for Virus Detection provides clinically relevant procedures for many of the newer diagnostic methodologies. Provides state-of-the-art PCR methods for amplification, quantitation, in situ hybridization, and multiplex reactions. Goes beyond PCR with protocols for 3SR, NASBA, LCR, SDA, and LAT. Covers important virus detection methods such as in situ hybridization; Southern, dot, and slot blots; branched chain signal amplification; and chemiluminescence. Includes quality control information crucial in research and clinical laboratories. Most chapters are written by the inventors and principal developers of the methodologies. Includes color plates, 77 figures, and 18 tables.

An Introduction to Genetic Engineering - Desmond S. T. Nicholl 2002-02-07

The author presents a basic introduction to the world of genetic engineering. Copyright © Libri GmbH. All rights reserved.

Chinese Journal of Genetics - 1993

Molecular Biology of the Cell - Bruce Alberts 2004

Recombinant DNA Laboratory Manual - Judith W. Zyskind 2014-05-12

Recombinant DNA Laboratory Manual is a laboratory manual on the fundamentals of recombinant DNA techniques such as gel electrophoresis, in vivo mutagenesis, restriction mapping, and DNA sequencing. Procedures that are useful for studying either prokaryotes or eukaryotes are discussed, and experiments are included to teach the fundamentals of recombinant DNA technology. Hands-on computer sessions are also included to teach students how to enter and manipulate sequence information. Comprised of nine chapters, this book begins with an introduction to bacterial growth parameters, how to measure bacterial cell growth, and how to plot cell growth data. The discussion then turns to the isolation and analysis of chromosomal DNA in bacteria and Drosophila; plasmid DNA isolation and agarose gel analysis; and

introduction of DNA into cells. Subsequent chapters deal with Tn5 mutagenesis of pBR329; DNA cloning in M13; DNA sequencing; and DNA gel blotting, probe preparation, hybridization, and hybrid detection. The book concludes with an analysis of lambda phage manipulations. This manual is intended for advanced undergraduate or beginning graduate students and should also be helpful to established investigators who are changing their research focus.

CRISPR-Cas Systems - Rodolphe Barrangou 2012-12-13

CRISPR/Cas is a recently described defense system that protects bacteria and archaea against invasion by mobile genetic elements such as viruses and plasmids. A wide spectrum of distinct CRISPR/Cas systems has been identified in at least half of the available prokaryotic genomes. On-going structural and functional analyses have resulted in a far greater insight into the functions and possible applications of these systems, although many secrets remain to be discovered. In this book, experts summarize the state of the art in this exciting field.

China Report - 1993

Addison-Wesley Biology - Addison Wesley 1996-04

Isotope Labeling of Biomolecules - Applications - 2016-01-11

Isotope Labeling of Biomolecules: Applications, the latest in the Methods in Enzymology series, focuses on stable isotope labeling methods and applications for biomolecules. This practical guide to biomolecular labeling looks at new techniques that are becoming widely used. Continues the legacy of this premier serial with quality chapters authored by leaders in the field Focuses on stable isotope labeling of biomolecules, which is important for structural studies of proteins and nucleic acids

Applied and Environmental Microbiology - 1996

Plasmids in Bacteria Donald R. Helinski 2012-12-06

Genetic Engineering of Plants - National Research Council 1984-02-01

"The book...is, in fact, a short text on the many practical problems...associated with translating the explosion in basic biotechnological research into the next Green Revolution," explains Economic Botany. The book is "a concise and accurate narrative, that also manages to be interesting and personal...a splendid little book." Biotechnology states, "Because of the clarity with which it is written, this thin volume makes a major contribution to improving public understanding of genetic engineering's potential for enlarging the world's food supply...and can be profitably read by practically anyone interested in application of molecular biology to improvement of productivity in agriculture."

Laboratory Safety Monograph National Cancer Institute (U.S.). Office of Research Safety 1978

Recombinant DNA and Biotechnology - Helen Kreuzer 1996

Laying the foundation; An overview of biotechnology; Genes, genetics, and geneticists; An overview of molecular of molecular biology: recombinant DNA technology; Classroom activities; DNA structure and function; Constructing a paper helix; DNA replication; From genes to proteins; Sizes of the Escherichia coli and human genomes; Extraction of bacterial DNA; Manipulation and analysis of DNA; DNA scissors: introduction to restriction enzymes; DNA goes to the races; Gel electrophoresis of pre-cut lambda DNA; Recombinant paper plasmids; Restriction analysis challenge worksheets; Detection of specific DNA sequences; DNA sequencing; The polymerase chain reaction: paper PCR; Transfer of genetic information; Transformation of Escherichia coli; Conjugative transfer of antibiotic resistance in Escherichia coli; Transduction of an antibiotic resistance gene; Agrobacterium tumefaciens: nature's plant genetic engineer; Analysing genetic variation; Generating genetic variation: the meiosis game; Analysing genetic variation: DNA typing; A mix-up at the hospital; A paternity case; The case of the bloody knife; The molecular basis of genetic diseases; Societal issues; Science, Technology, and society; Weighing technology's risks and benefits; Debating the risks of biotechnology; A decision-making model for bioethical issues; Bioethics case study: gene therapy; Bioethics case study: genetic screening; Careers in biotechnology; Appendixes;

Laboratory biosafety; Basis microbiological methods; Aseptic technique; Sterilization of equipment and media; Recipes; Biotechnology laboratory equipment; Using the equipment; Recommended reading; Teaching resources; National science education standards and the content of this book; Templates; Overhead masters.

Guidelines for Research Involving Recombinant DNA Molecules - 1980

Molecular Biology Techniques - Heather Miller 2011-10-18

This manual is an indispensable tool for introducing advanced undergraduates and beginning graduate students to the techniques of recombinant DNA technology, or gene cloning and expression. The techniques used in basic research and biotechnology laboratories are covered in detail. Students gain hands-on experience from start to finish in subcloning a gene into an expression vector, through purification of the recombinant protein. The third edition has been completely re-written, with new laboratory exercises and all new illustrations and text, designed for a typical 15-week semester, rather than a 4-week intensive course. The "project approach to experiments was maintained: students still follow a cloning project through to completion, culminating in the purification of recombinant protein. It takes advantage of the enhanced green fluorescent protein - students can actually visualize positive clones following IPTG induction. Cover basic concepts and techniques used in molecular biology research labs Student-tested labs proven successful in a real classroom laboratories Exercises simulate a cloning project that would be performed in a real research lab "Project" approach to experiments gives students an overview of the entire process Prep-list appendix contains necessary recipes and catalog numbers, providing staff with detailed instructions

Recombinant DNA Research -

Manipulation and Expression of Recombinant DNA Sue Carson 2005-12-15

This manual is an indispensable tool for introducing advanced undergraduates and beginning graduate students to the techniques of recombinant DNA technology, or gene cloning and expression. The techniques used in basic research and biotechnology laboratories are covered in detail. Students gain hands-on experience from start to finish in subcloning a gene into an expression vector, through purification of the recombinant protein. The second edition has been completely re-written, with new laboratory exercises and all new illustrations and text, designed for a typical 15-week semester, rather than a 4-week intensive course. The "project approach to experiments was maintained: students still follow a cloning project through to completion, culminating in the purification of recombinant protein. It takes advantage of the enhanced green fluorescent protein—students can actually visualize positive clones following IPTG induction. *Cover basic concepts and techniques used in molecular biology research labs *Student-tested labs proven successful in a real classroom laboratories *Exercises simulate a cloning project that would be performed in a real research lab *"Project" approach to experiments gives students an overview of the entire process *Prep-list appendix contains necessary recipes and catalog numbers, providing staff with detailed instructions

The Potato Genome - Swarup Kumar Chakrabarti 2017-12-26

This book describes the historical importance of potato (*Solanum tuberosum* L.), potato genetic resources and stocks (including *S. tuberosum* group Phureja DM1-3 516 R44, a unique doubled monoplid homozygous line) used for potato genome sequencing. It also discusses strategies and tools for high-throughput sequencing, sequence assembly, annotation, analysis, repetitive sequences and genotyping-by-sequencing approaches. Potato (*Solanum tuberosum* L.; $2n = 4x = 48$) is the fourth most important food crop of the world after rice, wheat and maize and holds great potential to ensure both food and nutritional security. It is an autotetraploid crop with complex genetics, acute inbreeding depression and a highly heterozygous nature. Further, the book examines the recent discovery of whole genome sequencing of a few wild potato species genomes, genomics in management and genetic enhancement of *Solanum* species, new strategies towards durable potato late blight resistance, structural analysis of resistance genes, genomics resources for abiotic stress management, as well as somatic cell genetics and modern approaches in true-potato-seed technology. The complete genome sequence provides a better understanding of potato

biology, underpinning evolutionary process, genetics, breeding and molecular efforts to improve various important traits involved in potato growth and development.

Inter-specific and Intra-specific Competition in Plants - Saharsh Khicha 2019-07-09

Academic Paper from the year 2019 in the subject Biology - Botany, grade: A, The University of Hong Kong, language: English, abstract: This investigation was planned to work on the different types of competition and solve the problem of the farmers suffering from shortages of crop production. Hence, the research question was framed: "Does decreasing distance (70mm, 50mm, 30mm, 10mm) of the wheat (*Triticum aestivum*) and chickpea (*Cicer arietinum*) seeds sown in the presence (5% solution of urea) and absence of urea effects the shoot length (mm) due to inhibitory effects of intraspecific and interspecific competition between them?" Crop production in India is labour intensive with limitation of scientific techniques. Unawareness in farmers for correct distance of sowing seed leads to low production of crops. This is due to overlapping of niche and thus the realised niche of a species which is the actual mode of existence resulting from adaptation and competition is developed. A research was undertaken by in Journal of Experimental Botany which acknowledged various factors that affect the crop production and solutions to overcome competition. The research would make farmers aware of a major factor like competition, that should be considered while crop production.

Molecular Biotechnology - Glick Bernard R 1998

The second edition explains the principles of recombinant DNA technology as well as other important techniques such as DNA sequencing, the polymerase chain reaction, and the production of monoclonal antibodies.

Recombinant DNA Research and Its Applications United States. Congress. Senate. Committee on Commerce, Science, and Transportation. Subcommittee on Science, Technology, and Space 1978

Molecular Cloning - Joseph Sambrook 2003

The American Biology Teacher - 1998

Biosafety in Microbiological and Biomedical Laboratories Centers for Disease Control (U.S.) 1988

Feature Papers - Michael Henson 2018-10-04

This book is a printed edition of the Special Issue "Feature Papers" that was published in *Processes*

History of Natto and Its Relatives (1405-2012) - William Shurtleff 2012

Biology Class 12 CBSE Board 8 YEAR-WISE (2013 - 2020) Solved Papers powered with Concept Notes - Disha Experts 2020-07-04

Advanced Methods in Molecular Biology and Biotechnology - Khalid Z. Masoodi 2020-11-10

Advanced Methods in Molecular Biology and Biotechnology: A Practical Lab Manual is a concise reference on common protocols and techniques for advanced molecular biology and biotechnology experimentation. Each chapter focuses on a different method, providing an overview before delving deeper into the procedure in a step-by-step approach. Techniques covered include genomic DNA extraction using cetyl trimethylammonium bromide (CTAB) and chloroform extraction, chromatographic techniques, ELISA, hybridization, gel electrophoresis, dot blot analysis and methods for studying polymerase chain reactions. Laboratory protocols and standard operating procedures for key equipment are also discussed, providing an instructive overview for lab work. This practical guide focuses on the latest advances and innovations in methods for molecular biology and biotechnology investigation, helping researchers and practitioners

enhance and advance their own methodologies and take their work to the next level. Explores a wide range of advanced methods that can be applied by researchers in molecular biology and biotechnology Features clear, step-by-step instruction for applying the techniques covered Offers an introduction to laboratory protocols and recommendations for best practice when conducting experimental work, including standard operating procedures for key equipment

Molecular Biology of the Fission Yeast - 2012-12-02

This highly researched yeast, which represents a system used by cell biologists, geneticists and molecular biologists, has been given only minimal coverage in the literature. Its properties make it an excellent organism for DNA and related biotechnology research. This book, which is the first attempt to collate existing information in one source, will be an invaluable aid to those initiating projects with this organism.

Sources of Medical Technology - Institute of Medicine 1995-01-01

Evidence suggests that medical innovation is becoming increasingly dependent on interdisciplinary research and on the crossing of institutional boundaries. This volume focuses on the conditions governing the supply of new medical technologies and suggest that the boundaries between disciplines, institutions, and the private and public sectors have been redrawn and reshaped. Individual essays explore the nature, organization, and management of interdisciplinary R&D in medicine; the introduction into clinical practice of the laser, endoscopic innovations, cochlear implantation, cardiovascular imaging technologies, and synthetic insulin; the division of innovating labor in biotechnology; the government- industry-university interface; perspectives on industrial R&D management; and the growing intertwining of the public and proprietary in medical technology.

Concepts of Biology - Samantha Fowler 2018-01-07

Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand. We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts. Annual Report of the International Laboratory for Research on Animal Diseases - International Laboratory for Research on Animal Diseases

Safety of Genetically Engineered Foods National Research Council 2004-07-08

Assists policymakers in evaluating the appropriate scientific methods for detecting unintended changes in food and assessing the potential for adverse health effects from genetically modified products. In this book, the committee recommended that greater scrutiny should be given to foods containing new compounds or unusual amounts of naturally occurring substances, regardless of the method used to create them. The book offers a framework to guide federal agencies in selecting the route of safety assessment. It identifies and recommends several pre- and post-market approaches to guide the assessment of unintended compositional changes that could result from genetically modified foods and research avenues to fill the knowledge gaps.