Manipulating The Mouse Embryo A Laboratory Manual

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The House Mouse CSHL Press
Scientific Frontiers in Developmental Toxicology and Risk Assessment reviews advances made during the last 10-15 years in fields such as developmental biology, molecular biology, and genetics. It describes a novel approach for how these advances might be used in combination with existing methodologies to further the understanding of mechanisms of developmental toxicity, to improve the assessment of chemicals for their ability to cause developmental toxicity, and to improve risk assessment for developmental defects. For example, based on the recent advances, even the smallest, simplest laboratory animals such as the fruit fly, roundworm, and zebrafish might be able to serve as developmental toxicological models for human biological systems. Use of such organisms might allow for rapid and inexpensive testing of large numbers of chemicals for their potential to cause developmental toxicity; presently, there are little or no developmental toxicity data available for the majority of natural and manufactured chemicals in use. This new approach to developmental toxicology and risk assessment will require simultaneous research on several fronts by experts from multiple scientific disciplines, including developmental toxicologists, developmental biologists, geneticists, epidemiologists, and biostatisticians.
Heritable Human Genome Editing Springer Science & Business Media
Introduction to immunochemistry for molecular biologists and other nonspecialists. Spiral.
Methods and Protocols CSHL Press
Manipulating the Mouse EmbryoA Laboratory ManualCold Spring Harbor, N.Y. : Cold Spring Harbor Laboratory Press
CRISPR-Cas Systems BoD – Books on Demand
This book is an essential anatomical resource for developmental biologists who need to know about any aspect of mouse developmental anatomy, as well as for geneticists using the mouse embryo as a model. The book is a companion to Kaufman's The Atlas of Mouse Development, and details the developmental anatomy of the early embryo, the transitional tissues, and all the major organ systems. It also provides extensive comparisons with human developmental anatomy, both normal and abnormal. The book has extensive reference indexes detailing developmental stage criteria. The Anatomical Basis of Mouse Development will be a key reference work for anyone who needs to understand developmental anatomy in normal and mutant mice. Key Features * Complements Kaufman's The Atlas of Mouse Development * Gives anatomical descriptions from oogenesis to birth, at a level of detail that goes beyond that found in most literature * Provides detailed explanations for geneticists and molecular biologists with limited anatomical background to help them understand the emergence of all the major structures in the mouse embryo * Contains comprehensive indexes detailing the appearance of over 1000 organs, tissues, and their components at different stages of mouse embryogenesis * Includes comparisons with normal and abnormal human development * Contains over 100 clear line diagrams showing mouse developmental anatomy as well as lineage relationships for the major organ systems
Studying Mouse Embryonic Development with OCT Springer Science & Business Media
Genetically very similar to the human species, mice play an important role in biomedical research and have served as experimental models for a wide variety of pathologies, including cancer, cardiovascular diseases, and behavioral disorders. In Transgenic Mouse Methods and Protocols, Marten Hofker and Jan van Deursen have assembled a multidisciplinary collection of readily reproducible methods for working with mice, and particularly for generating mouse models that will enable us to better understand gene function. Described in step-by-step detail by highly experienced investigators, these proven techniques include new methods for conditional, induced knockout, and transgenic mice, as well as for working with mice in such important research areas as immunology, cancer, and atherosclerosis. Such alternative strategies as random mutagenesis and viral gene transduction for studying gene function in the mouse are also presented. Care is taken to make clear the details of the available approaches, as well as their limitations. Up-to-date and highly practical, Transgenic Mouse Methods and Protocols demonstrates clearly for both novice and expert investigators how to make novel transgenic mouse models, and how to use them effectively to understand the role of gene function in human health and disease.
Methods and Protocols Humana
Methods in Mammalian Reproduction presents some of the techniques for manipulating, analyzing, observing, testing, and generally experimenting with mammalian mothers and their gametes and embryos. Mammalian reproduction involves an intimate relationship between mother and embryo. The first 18 chapters are arranged in an order that follows a developmental sequence from oocyte to fetal organs and the remaining seven chapters deal with the maternal side of the relationship. With strong focus on laboratory rodents and lagomorphs, the book starts with an introduction to in vitro oocyte maturation and experimental production of mammalian parthenogenetic. It goes on to describe the microtechniques in pre-implantation of embryos, production of chimeras, techniques for

early embryonic tissue separation, mammalian embryo preservation by freezing, and in vitro development of whole mouse embryos beyond the implantation stage. Chapters 11-15 discuss the in vitro implantation of mouse blastocysts, advances in rabbit embryo and in large mammal embryo cultures, embryo transfer in large domestic mammals, and manipulation of marsupial embryos and pouch young. The following chapters cover reproduction experiments using marsupials, domestic farm species, and primates including humans. Finally, the concluding chapters tackle the use of amniocentesis in prenatal diagnosis, collection and analysis of female genital tract secretions, analysis of antifertility action of intrauterine devices, and surgical induction of endometriosis. This book will be helpful to students, teachers, researchers, and clinical researchers who demand for more and better procedures for analysis of mammalian reproduction.

Scientific and Medical Aspects of Human Reproductive Cloning Oxford University Press

Expanding on the National Research Councilâ€™s Guide for the Care and Use of Laboratory Animals, this book deals specifically with mammals in neuroscience and behavioral research laboratories. It offers flexible guidelines for the care of these animals, and guidance on adapting these guidelines to various situations without hindering the research process. Guidelines for the Care and Use of Mammals in Neuroscience and Behavioral Research offers a more in-depth treatment of concerns specific to these disciplines than any previous guide on animal care and use. It treats on such important subjects as: The important role that the researcher and veterinarian play in developing animal protocols. Methods for assessing and ensuring an animalâ€™s well-being. General animal-care elements as they apply to neuroscience and behavioral research, and common animal welfare challenges this research can pose. The use of professional judgment and careful interpretation of regulations and guidelines to develop performance standards ensuring animal well-being and high-quality research. Guidelines for the Care and Use of Mammals in Neuroscience and Behavioral Research treats the development and evaluation of animal-use protocols as a decision-making process, not just a decision. To this end, it presents the most current, in-depth information about the best practices for animal care and use, as they pertain to the intricacies of neuroscience and behavioral research.

Methods in Mammalian Reproduction CRC Press

In Mouse Molecular Embryology: Methods and Protocols, expert researchers in the field detail many of the protocols used to study mouse embryology. These include protocols and techniques that are "close to the embryo": such as, manipulating embryonic gene expression, culturing explanted embryonic tissue and harvesting embryonic RNA. With additional chapters on fluorescence imaging, lineage tracing, and genetic ablation. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and key tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Mouse Molecular Embryology: Methods and Protocols seeks to aid scientist in the further study of mouse embryo and its relation to other aspects of biological research.

The Laboratory Mouse National Academies Press

Protecting the reproductive potential of young patients undergoing cancer therapy is increasingly important. With modern treatment protocols, 80% of patients can be expected to survive. It has been estimated that up to one in 250 young adults will be a survivor of childhood cancer in the future; infertility, however, may be a consequence. As a wide range of fertility preservation methods are increasingly offered by clinicians, this systematic and comprehensive textbook dealing with the cryobiology, technology and clinical approach to this therapy will be essential reading to infertility specialists, embryologists, oncologists, cryobiologists, ObGyns, andrologists, and urologists with an interest in fertility preservation. Fertility Cryopreservation reviews all the techniques of this increasingly important field within reproductive medicine. It covers the basic principles of pertinent cryobiology, and contains major sections on the different therapies available, written by international specialists combining experience from both academic centers and commercial industries.

Microinjection Cold Spring Harbor, N.Y. : Cold Spring Harbor Laboratory Press

Since 1998, the volume of research being conducted using human embryonic stem (hES) cells has expanded primarily using private funds because of restrictions on the use of federal funds for such research. Given limited federal involvement, privately funded hES cell research has thus far been carried out under a patchwork of existing regulations, many of which were not designed with this research specifically in mind. In addition, hES cell research touches on many ethical, legal, scientific, and policy issues that are of concern to the public. This report provides guidelines for the conduct of hES cell research to address both ethical and scientific concerns. The guidelines are intended to enhance the integrity of privately funded hES cell research by encouraging responsible practices in the conduct of that research.

A Laboratory Manual National Academies Press

This book covers a variety of topics on animal reproduction and reproductive medicine. With evolving technology and a continual increase in knowledge, regarding domestic pets or agricultural animals, new information is available on diverse topics in this broad field. The book contents reflect the individual experience of authors, who developed a number of themes identified as attracting interest in the field. As it is, new opportunities were opened for productive collaboration. We have tried to provide you with current, specialised information that may be useful to students, clinicians and researchers. We hope this book inspires you to embrace these themes, foster the debate on particular topics and may be used as a start-up source for exploring the theriogenology field.

A Handbook of Mutation Analysis Gulf Professional Publishing

Animal biotechnology is a broad field including polarities of fundamental and applied research, as well as DNA science, covering key topics of DNA studies and its recent applications. In Introduction to Pharmaceutical Biotechnology, DNA isolation procedures followed by molecular markers and screening methods of the genomic library are explained in detail. Interesting areas such as isolation, sequencing and synthesis of genes, with broader coverage of the latter, are also described. The book begins with an introduction to biotechnology and its main branches, explaining both the basic science and the applications of biotechnology-derived pharmaceuticals, with special emphasis on their clinical use. It then moves on to the historical development and scope of biotechnology with an overall review of early applications that scientists employed long before the field was defined. Additionally, this book offers first-hand accounts of the use of biotechnology tools in the area of genetic engineering and provides comprehensive information related to current developments in the

following parameters: plasmids, basic techniques used in gene transfer, and basic principles used in transgenesis. The text also provides the fundamental understanding of stem cell and gene therapy, and offers a short description of current information on these topics as well as their clinical associations and related therapeutic options.

Manual of Embryo Culture in Human Assisted Reproduction Cambridge University Press

This reader-friendly manual provides a practical "hands on" guide to the culture of human embryonic and somatic stem cells. By presenting methods for embryonic and adult lines side-by-side, the authors lay out an elegant and unique path to understanding the science of stem cell practice. The authors begin with a broad-based introduction to the field, and also review legal and regulatory issues and patents. Each experimental strategy is presented with an historical introduction, detailed method, discussion of alternative methods, and common pitfalls. This lab guide for researchers also serves as a textbook for undergraduate and graduate students in laboratory courses. • Offers a comprehensive introduction to stem cell biology and culture for medical and biology researchers investigating diagnostics and treatments for various diseases • Presents a historical introduction, discussion of alternative methods, and common pitfalls for basic and advanced experimental strategies • Includes new chapters devoted to iPS cells and other alternative sources for generating human stem cells written by the scientists who made these breakthroughs

Molecular Embryology National Academies Press

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A Laboratory Manual Humana Press

Human reproductive cloning is an assisted reproductive technology that would be carried out with the goal of creating a newborn genetically identical to another human being. It is currently the subject of much debate around the world, involving a variety of ethical, religious, societal, scientific, and medical issues. Scientific and Medical Aspects of Human Reproductive Cloning considers the scientific and medical sides of this issue, plus ethical issues that pertain to human-subjects research. Based on experience with reproductive cloning in animals, the report concludes that human reproductive cloning would be dangerous for the woman, fetus, and newborn, and is likely to fail. The study panel did not address the issue of whether human reproductive cloning, even if it were found to be medically safe, would beâ€"or would not beâ€"acceptable to individuals or society.

A Laboratory Guide National Academies Press

This volume describes culture media and solutions used in human ART; how they have been developed for in vitro human pre-implantation embryo development, the function and importance of the various components in media and solutions and how they interact, and how the systems in which these are used can influence outcomes. Chapters discuss inorganic solutes, energy substrates, amino acids, macromolecules, cytokines, growth factors, buffers, pH, osmolality, and the interaction of these parameters. The role of incubators and other physical factors are reviewed, along with the relevance and prospects of emerging technologies: morphokinetic analysis using time-lapse imaging and dynamic fluid incubation systems. Results of prospective randomized trials are emphasized to ascertain the added value of these techniques for selecting viable embryos. This comprehensive guide will be invaluable for embryologists, physicians and all personnel involved in the fluid products used in human ART seeking to optimize their successful use of these components.

Methods and Protocols Cambridge University Press

With the advent of transgenic technology, which allows the identification of specific gene activities in developing mammalian organisms, the house mouse has once again taken a very important place in experimental research as one of the genetically best understood mammals. More than ever, molecular biologists are in need of a detailed, standardized description of the anatomy of the developing mouse embryo. In this classic compendium, now brought up to date and corrected, the author presents each stage of mouse development in photographs and micrographs using hybrids of two inbred strains as a standard. Organ systems are systematically reconstructed from fertilization until after birth. Molecular biologists tracing the effects of genetic manipulations, as well as students and researchers of developmental biology, will appreciate the renewed availability of this standard reference work for its unparalleled accuracy, its attention to anatomical detail, and the extent of its documentation.

Genetic Characterization of the Preimplantation Embryo Development (PED) Gene Using the Congenic B6.K1 and B6.K2 Strains of Mice Springer Science & Business Media

In Molecular Embryology, expert investigators provide a comprehensive guide to the cutting-edge methods used today across the dramatically growing field of vertebrate molecular embryology. These powerful techniques take advantage of the most commonly used vertebrate experimental models: murine embryos for their genetics, chick embryos for in vivo manipulation, zebrafish for mutagenesis, amphibian embryos, and nonvertebrate chordates. The major techniques of experimental molecular biology and the particular advantages of each different species are emphasized. Detailed, easy-to-follow protocols, together with relevant background information and helpful tips, optimize the methods for success. Molecular Embryology brings together in one volume all the major techniques and common experimental species needed to study the mechanisms of biological development in vertebrates. Bound to become a standard reference in this field, the book makes it possible for experienced and novice researchers alike to move between embryos of diverse vertebrate classes as their project progresses, ensuring their ability to utilize the experimental advantages of different systems to address specific developmental questions.

Mouse Phenotypes National Academies Press

Amphibian embryos are supremely valuable in studies of early vertebrate development because they are large, handle easily, and can be obtained at many interesting stages. And of all the amphibians available for study, the most valuable is Xenopus laevis,which is easy to keep and ovulates at any time of year in response to simple hormone injections. Xenopusembryos have been studied for years but this is a particularly exciting time for the field. Techniques have become available very recently that permit a previously impossible degree of manipulation of gene expression in intact embryos, as well as the ability to visualize the results of such manipulation. As a result, a sophisticated new understanding of Xenopusdevelopment has emerged, which ensures the species' continued prominent position among the organisms favored for biological investigation. This manual contains a comprehensive collection of protocols for the study of early development in Xenopusembryos. It is written by several of the field's most prominent investigators in the light of the experience they gained as instructors in an intensive laboratory course taught at Cold Spring Harbor Laboratory since 1991. As a result it contains pointers, hints, and other technical knowledge

not readily available elsewhere. This volume is essential reading for all investigators interested in the developmental and cell biology of Xenopusand vertebrates generally. Many of the techniques described here are illustrated in an accompanying set of videotapeswhich are cross-referenced to the appropriate section of the manual.

Stem Cells and Tissue Repair Humana
An easy to read, practical description of the human IVF laboratory, from laboratory start-up and training to complex, specialized procedures.