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Stem Cell Research National Academy Press
The commercialization of biotechnology has resulted in an intensive search for new biological resources for the purposes of increasing food productivity, medicinal applications, energy production, and various other applications. Although biotechnology has produced many benefits for humanity, the exploitation of the planet's natural resources has also resulted in some undesirable consequences such as diminished species biodiversity, climate change, environmental contamination, and intellectual property right and patent concerns.This book discusses the role of biological, ecological, environmental, ethical, and economic issues in the interaction between biotechnology and biodiversity, using different contexts. No other book has discussed all of these issues in a comprehensive manner. Of special interest is their impact when biotechnology is shared between developed and developing countries, and the lack of recognition of the rights of indigenous populations and traditional farmers in developing countries by large multinational corporations.
Frontiers in Stem Cell and Regenerative Medicine Research World Scientific
Stem Cell Research takes a multi-disciplinary approach to the topic of human embryonic stem cell research, starting with the breakthrough discovery up through the present day controversy. The book invites the reader to join the conversation by providing a well balanced approach to many of the issues surrounding the development of this controversial scientific field. It includes the thoughts and experiences of scientists, journalists and ethicists as it tried to approach the topic through a variety of different academic disciplines. The book will help the non-scientist understand the biology, research regulations and funding; and simultaneously it will help the scientist better comprehend the full spectrum of ethical, religious, and policy debates.
Encyclopedia of Stem Cell Research Penguin
Mesenchymal Stem Cells: Biological Concepts, Current Advances, Opportunities and Challenges systematically summarizes and discusses the basic concepts and latest updates of mesenchymal stem cells (MSCs) in the past 60 years, as well as the latest progress of clinical translational research and regulatory policy at home and abroad, which will be of great practical significance for promoting and guiding the future development of stem cell production and regenerative medicine. Systematically introduces the latest updates on Mesenchymal stem cells (MSCs), helping readers have a systematic understanding of MSCs Summarizes knowledge on MSC-based cytotherapy in clinical practice to benefit clinicians and help them design MSC-relevant clinical trials Introduces newly developed concepts of MSC-based tissue engineering
Stem Cell Repair and Regeneration Newnes
This book discusses the recent developments in the therapeutic implications of cancer stem cells for the effective diagnosis, prognosis, and treatment of cancer. It summarizes the various stem cells of common cancers including colon, pancreas, lungs, prostate, melanoma, and glioblastoma, and reviews the potential role of cancer stem cells in tissue aggressiveness, examining the functional contribution of cancer stem cells in the establishment and recurrence of cancerous tumors. Further, it explores the potential of cancer stem cells as novel therapeutic targets for the treatment and prevention of tumor progression. The book also discusses the various approaches for detecting, isolating, and characterizing different cancer stem cells and signaling pathways that control their replication, survival, and differentiation. Lastly, it explores the key features and mechanisms of drug resistance, chemo-resistance, and radio-resistance in cancer stem cells to improve therapeutic rationale.
Pluripotent Stem Cells—Advances in Research and Application: 2013 Edition Springer Nature
There is much public interest in stem cells, but also much confusion and misinformation. Developmental biologist Jonathan Slack explains the biology behind stem cells - what they are what scientists do with them, what stem cell therapies are available today, and what can be expected to happen in the future.
Assessing the Medical Risks of Human Oocyte Donation for Stem Cell Research Springer Science & Business Media
"Stem cells offer tremendous promise for advancing health and medicine. Whether being used to replace damaged cells and organs or else by supporting the body's intrinsic repair mechanisms, stem cells hold the potential to treat such debilitating conditions as Parkinson's disease, diabetes, and spinal cord injury. Clinical trials of stem cell treatments are under way in countries around the world, but the evidence base to support the medical use of stem cells remains limited. Despite this paucity of clinical evidence, consumer demand for treatments using stem cells has risen, driven in part by a lack of available treatment options for debilitating diseases as well as direct-to-consumer advertising and public portrayals of stem cell-based treatments. Clinics that offer stem cell therapies for a wide range of diseases and conditions have been established throughout the world, both in newly industrialized countries such as China, India, and Mexico and in developed countries such as the United States and various European nations. Though these therapies are often promoted as being established and effective, they generally have not received stringent regulatory oversight and have not been tested with rigorous trials designed to determine their safety and likely benefits. In the absence of substantiated claims, the potential for harm to patients--as well as to the field of stem cell research in general--may outweigh the potential benefits. To explore these issues, the Institute of Medicine, the National Academy of Sciences, and the International Society for Stem Cell Research held a workshop in November 2013. Stem Cell Therapies summarizes the workshop. Researchers, clinicians, patients, policy makers, and others from North America, Europe, and Asia met to examine the global pattern of treatments and products being offered, the range of patient experiences, and options to maximize the well-being of patients, either by protecting them from treatments that are dangerous or ineffective or by steering them toward treatments that are effective. This report discusses the current environment in which patients are receiving unregulated stem cell offerings, focusing on the treatments being offered and their risks and benefits. The report considers the evidence base for clinical application of stem cell technologies and ways to assure the quality of stem cell offerings"--Publisher's description.
Guidelines for Human Embryonic Stem Cell Research Oxford University Press
Human Stem Cell Technology & Biology: A Research Guide and Laboratory Manual integrates readily accessible text, electronic and video components with the aim of effectively communicating the critical information needed to understand and culture human embryonic stem cells. Key Features: An authoritative, comprehensive, multimedia training manual for stem cell researchers Easy to follow step-by-step laboratory protocols and instructional videos provide a valuable resource A must-have for developing laboratory course curriculums, training courses, and workshops in stem cell biology Perspectives written by the world leaders in the field Introductory chapters will provide background information The volume will be a valuable reference resource for both experienced investigators pursuing stem cell and induced pluripotent stem cell research as well as those new to this field.
Stem Cells and Regenerative Medicine John Wiley & Sons
Perinatal Stem Cells provides researchers and clinicians with a comprehensive description of the current clinical and pre-clinical applications of stem cells derived from perinatal sources, such as amniotic fluid, placenta and placental membranes, the umbilical cord and Wharton’s jelly. It's compiled by leading experts in the field, offering readers detailed insights into sources of perinatal stem cells and their potential for disease treatment. Therapeutic applications of perinatal stem cells include the treatment of in utero and pregnancy related diseases, cardiac disease, liver disease, pulmonary disease, inflammatory diseases, for hematopoietic regeneration, and for neural protection after stroke or traumatic brain injury. In addition, the rapid advance in clinical translation and commercialization of perinatal stem cell therapies is highlighted in a section on Clinical and Industry Perspective which provides insight into the new opportunities and challenges involved in this novel and exciting industry. Explores current clinical and pre-clinical application of stem cells derived from perinatal sources Offers detailed insight into sources of perinatal stem cells and their potential for disease treatment Discusses progress in the manufacturing, banking and clinical translation of perinatal stem cells Edited by a world-renowned team to present a complete story of the development and promise of perinatal stem cells
Stem Cells Penguin
What is a stem cell? We have a basic working definition, but the way we observe a stem cell function in a dish may not represent how it functions in a living organism. Only this is clear: Stem cells are the engine room of multicelluar organisms—both plants and animals. However, controversies, breakthroughs, and frustration continue to swirl in eternal storms through this rapidly moving area of research. But what does the average person make of all this, and how can an interested scholar probe this vast sea of information? The Encyclopedia of Stem Cell Research provides a clear understanding of the basic concepts in stem cell biology and addresses the politics, ethics, and challenges currently facing the field. While stem cells are exciting alone, they are also clearly fueling the traditional areas of developmental biology and the field of regenerative medicine. These two volumes present more than 320 articles that explore major topics related to the emerging science of stem cell research and therapy. Key Features · Describes the different types of stem cells that have been reported so far and, where possible, tries to explain for each age, tissue, and species what is known about the biology of the cells and their history · Captures a strong sense of stem cell biology as it stands today and provides the reader with a reference manual to probe the mysteries of the field · Considers various religious, legal, and political perspectives · Includes selected reprints of major journal articles that pertain to the milestones achieved in stem cell research · Elucidates stem cell terminology for the nonscientist. Key Themes · Biology · Clinical Trials · Countries · Diseases · Ethics · History and Technology · Industry · Institutions · Legal · Organizations · People · Politics · Religion · States With contributions from scholars and institutional experts in the stem cell and social sciences, this Encyclopedia provides a primarily nonscientific resource to understanding the complexities of stem cell research for academic and public libraries.
Ethical Issues in Human Stem Cell Research: Commissioned papers Elsevier
For over a decade, Global Health Watch has been the definitive source for alternative analysis on health. This new edition addresses the key challenges facing governments and health practitioners today, within the context of rapid shifts in global governance mechanisms and the UN’s Sustainable Development Goals. Like its predecessors, it challenges conventional wisdom while pioneering innovative new approaches to the field. Collaboratively written by academics and activists drawn from a variety of movements, research institutions and civil society groups, it covers some of the most pressing issues in world health, from the resurgence of epidemic diseases such as Ebola to the crisis in the WHO, climate change and the ‘war on drugs’. Combining rigorous analysis with practical policy suggestions, Global Health Watch 5 offers an accessible and compelling case for a radical new approach to health and healthcare across the world.
Stem Cell Therapies National Academies Press
This issue of Progress in Brain Research is split over 2 volumes, bringing together cutting-edge research on Functional Neural Transplantation. The 2 volumes review current knowledge and understanding, provide a starting point for researchers and practitioners entering the field, and build a platform for further research and discovery. Leading authors review the state-of-the-art in their field of investigation, and provide their views and perspectives for future research Chapters are extensively referenced to provide readers with a comprehensive list of resources on the topics covered All chapters include comprehensive background information and are written in a clear form that is also accessible to the non-specialist
Stem Cells: A Very Short Introduction Imperial College Press
Discusses the ethical issues involved in the use of human embryonic stem cells in regenerative medicine.
Stem Cells and the Future of Regenerative Medicine CRC Press
Stem cell and regenerative medicine research is a hot area of research which promises to change the face of medicine as it will be practiced in the years to come. Challenges in the 21st century to combat diseases such as cancer, Alzheimer and related diseases may well be addressed employing stem cell therapies and tissue regeneration. Frontiers in Stem Cell and Regenerative Medicine Research is essential reading for researchers seeking updates in stem cell therapeutics and regenerative medicine. This volume includes reviews on the following topics: -the role of microvesicles and exosomes in mesenchymal stem cell (MSCs) in treating diseases while overcoming side effects -alternative models

for understanding cancer stem cell biology -stem cells treatments for orthopaedic injury and endocrine disorders -wound healing biomaterials -theoretical models of hematopoietic cell dynamics (with implications for bone marrow transplants)

Stem Cell Therapies National Academies Press

Recent scientific breakthroughs, celebrity patient advocates, and conflicting religious beliefs have come together to bring the state of stem cell researchâ€"specifically embryonic stem cell researchâ€"into the political crosshairs. President Bush's watershed policy statement allows federal funding for embryonic stem cell research but only on a limited number of stem cell lines. Millions of Americans could be affected by the continuing political debate among policymakers and the public. Stem Cells and the Future of Regenerative Medicine provides a deeper exploration of the biological, ethical, and funding questions prompted by the therapeutic potential of undifferentiated human cells. In terms accessible to lay readers, the book summarizes what we know about adult and embryonic stem cells and discusses how to go about the transition from mouse studies to research that has therapeutic implications for people. Perhaps most important, Stem Cells and the Future of Regenerative Medicine also provides an overview of the moral and ethical problems that arise from the use of embryonic stem cells. This timely book compares the impact of public and private research funding and discusses approaches to appropriate research oversight. Based on the insights of leading scientists, ethicists, and other authorities, the book offers authoritative recommendations regarding the use of existing stem cell lines versus new lines in research, the important role of the federal government in this field of research, and other fundamental issues.

Mesenchymal Stem Cells as New Candidates for Stemcell Based Dental Therapies Elsevier

This accessibly written book explores the different types of stem cells, their current and potential future medical applications, and the many controversies that surround their creation and use. Whether from adults or embryos, stem cells have the potential to develop into many other types of cells—an ability that makes them potentially invaluable for curing a wide variety of diseases and disorders. And while some stem cell treatments are already in use today and have achieved remarkable results, the use of such cells continues to be clouded in controversy. This second edition of Steam Cells offers a wealth of new information and features. Coverage of research breakthroughs in the past decade has been added, including descriptions of recently discovered types of stem cells and stem cell therapies. In addition to addressing ethical and scientific controversies, the book also addresses issues such as the discrepancy between the public's expectations for regenerative medicine and current medical realities. Also new in this edition is a collection of case studies, each of which helps to make the topics discussed in the book more accessible to readers.

Human Stem Cell Technology and Biology Bloomsbury Publishing USA

THE STEM CELL IS SET TO DOMINATE POPULAR AWARENESS OF SCIENCE LIKE THE ATOM BOMB DID A GENERATION AGO. No area of science holds such immediate promise for treating disease and improving human lives as stem cell research. But no area of science also causes such fundamental ethical concern and such ferocious political conflict.

Pluripotent Stem Cells Nova Biomedical Books

Stem cells offer tremendous promise for advancing health and medicine. Whether being used to replace damaged cells and organs or else by supporting the body's intrinsic repair mechanisms, stem cells hold the potential to treat such debilitating conditions as Parkinson's disease, diabetes, and spinal cord injury. Clinical trials of stem cell treatments are under way in countries around the world, but the evidence base to support the medical use of stem cells remains limited. Despite this paucity of clinical evidence, consumer demand for treatments using stem cells has risen, driven in part by a lack of available treatment options for debilitating diseases as well as direct-to-consumer advertising and public portrayals of stem cell-based treatments. Clinics that offer stem cell therapies for a wide range of diseases and conditions have been established throughout the world, both in newly industrialized countries such as China, India, and Mexico and in developed countries such as the United States and various European nations. Though these therapies are often promoted as being established and effective, they generally have not received stringent regulatory oversight and have not been tested with rigorous trials designed to determine their safety and likely benefits. In the absence of substantiated claims, the potential for harm to patients - as well as to the field of stem cell research in general - may outweigh the potential benefits. To explore these issues, the Institute of Medicine, the National Academy of Sciences, and the International Society for Stem Cell Research held a workshop in November 2013. Stem Cell Therapies summarizes the workshop. Researchers, clinicians, patients, policy makers, and others from North America, Europe, and Asia met to examine the global pattern of treatments and products being offered, the range of patient experiences, and options to maximize the well-being of patients, either by protecting them from treatments that are dangerous or ineffective or by steering them toward treatments that are effective. This report discusses the current environment in which patients are receiving unregulated stem cell offerings, focusing on the treatments being offered and their risks and benefits. The report considers the evidence base for clinical application of stem cell technologies and ways to assure the quality of stem cell offerings.

Monitoring Stem Cell Research Zed Books Ltd.

Embryonic stem cell research holds unique promise for developing therapies for currently incurable diseases and conditions, and for important biomedical research. However, the process through which embryonic stem cells are obtained involves the destruction of early human embryos. Katrien Devolder focuses on the tension between the popular view that an embryo should never be deliberately harmed or destroyed, and the view that embryonic stem cell research, because of its enormous promise, must go forward. She provides an in-depth ethical analysis of the major philosophical and political attempts to resolve this tension. One such attempt involves the development of a middle ground position, which accepts only types or aspects of embryonic stem cell research deemed compatible with the view that the embryo has a significant moral status. An example is the position that it can be permissible to derive stem cells from embryos left over from in vitro fertilisation but not from embryos created for research. Others have advocated a technical solution. Several techniques have been proposed for deriving embryonic stem cells, or their functional equivalents, without harming embryos. An example is the induced pluripotent stem cell technique. Through highlighting inconsistencies in the arguments for these positions, Devolder argues that the central tension in the embryonic stem cell debate remains unresolved. This conclusion has important implications for the stem cell debate, as well as for policies inspired by this debate.

Ethical Issues in Human Stem Cell Research: Report and recommendations Academic 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.

Cancer Stem Cells: New Horizons in Cancer Therapies Springer Science & Business Media

It is widely understood that stem cell treatments have the potential to revolutionize medicine. Because of this potential, in 2004 California voters approved Proposition 71 to set up a 10-year, $3 billion program to fund research on stem cells. Under the direction of the California Institute for Regenerative Medicine, this program will pay to build facilities for stem cell research and will fund doctors and scientists to carry out research with the ultimate goal of helping to develop therapies based on stem cells. For this research to move forward, however, will require a steady supply of stem cells, particularly human embryonic stem cells. Those stem cells are collected from developing human embryos created from eggs-or oocytes-harvested from the ovaries of female donors. Thus much of the promise of stem cells depends on women choosing to donate oocytes to the research effort. The oocyte donation process is not without risk, however. Donors are given doses of hormones to trigger the production of more eggs than would normally be produced, and this hormone treatment can have various side effects. Once the eggs have matured in the ovary, they must be retrieved via a surgical procedure that is typically performed under anesthesia, and both the surgery and the anesthesia carry their own risks. Furthermore, given the very personal nature of egg donation, the experience may carry psychological risks for some women as well. With this in mind, in 2006 the California Institute for Regenerative Medicine contracted with the National Academies to organize a workshop that would bring together experts from various areas to speak about the potential risks of oocyte donation and to summarize what is known and what needs to be known about this topic. The Committee on Assessing the Medical Risks of Human Oocyte Donation for Stem Cell Research was formed to plan the workshop, which was held in San Francisco on September 28, 2006. This report is a summary and synthesis of that workshop.