

Advanced Surfaces for Stem Cell Research

2020 The book outlines first the importance of Extra Cellular Matrix (ECM), which is a natural surface for most of cells. In the following chapters the influence of biological, chemical and physical properties of surfaces in micro and nano-scale on stem cell behavior are discussed including the mechanotransduction. Biomimetic and bioinspired approaches are highlighted for developing microenvironment of surface engineering applications are discussed in tissue engineering, regenerative medicine and different type of biomaterials in various chapters of the book. This book brings together innovative methodologies and strategies and development of Advanced Surfaces in Stem Cell Research. Well-known worldwide researchers deliberate subjects including: Extracellular matrix proteins for stem cell fate The superficial mechanical and physical properties of microenvironment as stem cell fate regulator Effects of mechanotransduction on stem cell behavior Modulation of stem cells behavior through bioactive surfaces Influence of controlled micro and nanoengineered surfaces on Nanostructured polymeric surfaces for stem cells Laser surface modification techniques and stem cells applications Plasma polymer deposition: a versatile tool for stem cell research Application of bioreactor concept and microregeneration and augmentation treatments Substrates and surfaces for control of pluripotent stem cell fate and function Application of biopolymer-based, surface modified devices in transplant medicine and tissue engineering biopolymer for tissue engineering

18 2019 Factors operating in pluripotent cells -- Molecular mediators of Mesenchymal Stem Cell (MSC) -- Insulin and germline proliferation in Caenorhabditis -- Generation of mature B-cells from embryonic stem cells -- What are we missing? -- Activation and regulation of reserve liver progenitor cells -- Adult cardiac-derived stem cells: differentiation and survival regulators -- TGF-Beta1 regulates differentiation of bone marrow mesenchymal stem cells -- Intake of folic acid and neural crest stem cells -- Modulation of the generation of dopaminergic neurons from human neural stem cells by Bcl-XL. Mechanisms of action -- Glucocorticoid hedgehog agonists in neurogenesis -- Human mesenchymal stem cells -- Regulation of muscle stem cell activation -- the role of growth factors and extracellular matrix -- Thymosins and muscle regeneration -- Micro RNAs and mesenchymal stem cells -- MicroRNA in muscle cells -- Transforming growth factor beta superfamily in mouse embryonic stem cell self-renewal -- The biology of Hifa proteins in cell differentiation and disease -- Regulatory role of Klf5 in early mouse development of stem cells -- Bam and Bgcn in Drosophila germ line stem cell differentiation -- The effects of mechanical loading on mesenchymal stem cell differentiation and matrix production.

The Stem Cell Cure 09 2021 The 150+ year lifespan of our ancient ancestors can be achieved once again by harnessing the power of our own cells with The Stem Cell Cure! Renowned regenerative and restorative sports medicine expert Dr. M.D. Goswami, M.D. provides advanced minimally invasive, non-surgical treatments to help his patients get back to peak performance levels - no matter their age. Harnessing the transformative power of stem cells is central to his cell therapy is proven to be effective in the treatment of many common conditions from arthritis and back pain to Alzheimer's, Parkinson's, and cancer. This book is an accessible and informative introduction to the amazing power of stem cell therapy - the biggest revolution in medicine since the discovery of penicillin, and a wave of the future. Co-authored by bestselling author and popular keynote speaker Kerry Johnson MBA PhD, The Stem Cell Cure provides step-by-step guidance to boost their health and vitality for a lifetime by recovering, regenerating, and repairing injuries and disease.

The Science of Stem Cells 20 2022 Introduces all of the essential cell biology and developmental biology background for the study of stem cells This book gives you all the important information you need to become a stem cell biologist. The characterization of cells, genetic techniques for modifying cells and organisms, tissue culture technology, transplantation immunology, properties of pluripotent and tissue specific stem cells and, in particular, the relevant developmental biology. It dispels many misconceptions about stem cells—especially that they can be miracle cells that can cure all ills. The book puts emphasis on stem cell behavior in its biological context and on how to study stem cells. The approach is simple, direct, and logical, and evidence is given to support conclusions. Stem cell biology has huge potential for advancing therapies for many distressing and recalcitrant diseases, and its potential will be realized by many people as possible have a good grounding in the science of stem cells. Content focused on the basic science underpinning stem cell biology Covers techniques of studying cell properties and cell lineage in vivo and in vitro embryonic development and cell differentiation, as well as the essential cell biology processes of signaling, gene expression, and cell division Includes instructor resources such as further reading and figures for downloading of Cytoskeleton supplement summarizing current clinical applications of stem cells Written by a prominent leader in the field, The Science of Stem Cells is an ideal course book for advanced undergraduates or graduate students studying stem cell biology, tissue engineering, and other topics of science and biology.

Stem Cell Sep 19 2019 In this volume, the contributing authors from top labs involved in stem cell therapeutics share the latest advances in the field of stem cell research. The book covers many aspects of stem cell-based therapies that have made toward stem cell therapy for liver, ocular, and cardiovascular diseases as well as cancer. This volume serves as a continuation of Prof. Khawaja Hunsain Haider's previously edited books pertaining to stem cells-based therapies. The ideal book for researchers involved in drug development as well as regenerative medicine and stem cell-based therapy. The secondary audience includes graduate and postgraduate medical students, doctors, cellular pharmacologists, and researchers involved in using stem cells as ex-vivo disease models for drug development.

Stem Cells: A Very Short Introduction 08 2022 The topic of stem cells has a high profile in the media. We've made important advances in our scientific understanding, but despite this the clinical applications of stem cells are still limited and most real stem cell therapy carried out today is some form of bone marrow transplantation. At the same time, a scandalous spread of unproven stem cell treatments by private clinics represents a serious problem, with which are backed by limited scientific rationale, and which are at best ineffective, and at worse harmful. This Very Short Introduction introduces stem cells, exploring what they are, and what scientists do with them. It introduces stem cells, Jonathan Slack explains how they can be used to treat diseases such as retinal degeneration, diabetes, Parkinson's disease, heart disease, and spinal trauma. He also discusses the important technique of bone marrow transplantation and some other types of current stem cell therapy, used for the treatment of blindness and of severe burns. Slack warns against fake stem cell treatments and discusses how to distinguish real from fake treatments. He also describes progress in the field, and looks forward to what we can expect to happen in the next few years Very Short Introductions: Brilliant, Sharp, Inspiring ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make topics highly readable.

Stem Cells For Dummies 22 2022 The first authoritative yet accessible guide to this controversial topic Stem Cell Research For Dummies offers a balanced, plain-English look at this politically charged topic, cutting away the red tape and the facts clearly for you, free from debate. It explains what stem cells are and what they do, the legalities of harvesting them and using them in research, the latest research findings from the U.S. and abroad, and the pros and cons of stem cell therapies in the short and long term. Explains the differences between adult stem cells and embryonic/umbilical cord stem cells Provides both sides of the political debate and the pros and cons of each side's opinions Includes an overview of using stem cell therapy and its promise for the future Comprehensive and unbiased, Stem Cell Research For Dummies is the only guide you need to understand this volatile issue.

Essentials of Stem Cell Biology 24 2022 First developed as an accessible abridgement of the successful Handbook of Stem Cells, Essentials of Stem Cell Biology serves the needs of the evolving population of scientists, researchers, and students that are embracing the latest advances in stem cells. Representing the combined effort of seven editors and more than 200 scholars and scientists whose pioneering work has defined our understanding of stem cells, this book provides a general understanding of adult and embryonic stem cells with a presentation by the world's experts of the latest research information about specific organ systems. From basic biology/mechanisms, early development, mesoderm, endoderm, methods to application of stem cells to specific human diseases, regulation and ethics, and patient perspectives, no topic in the field of stem cells is left uncovered. Selected for inclusion in Doodly's Core Collection development tool for health sciences libraries Contributions by Nobel Laureates and leading international investigators Includes two entirely new chapters devoted exclusively to induced pluripotent stem (iPS) cells and to stem cell biology who made the breakthrough Edited by a world-renowned author and researcher to present a complete story of stem cells in research, in application, and as the subject of political debate Presented in full color with glossy, high-quality photographic entries replacing references

Handbook of Stem Cells 24 2020 New discoveries in the field of stem cells increasingly dominate the news and scientific literature revealing an avalanche of new knowledge and research tools that are producing therapies for a wide variety of adult diseases that afflict humanity. The Handbook of Stem Cells integrates this exciting area of life science, combining in two volumes the requisites for a general understanding of adult stem cells. Organized in two volumes entitled Pluripotent Stem Cells and Cell Biology and Adult and Fetal Stem Cells, this work contains contributions from the world's experts in stem cell research to provide a description of the experimental protocols needed to study and characterize stem cells and progenitor populations as well as a the latest information of what is known about each specific organ system. Provides comprehensive coverage on this exciting field. Contains contributions by the foremost authorities and premiere names in the field of stem cell research Companion website - <http://booksite.elsevier.com/9780123859426/> - contains over 250 color figures in presentation

Engineering Materials for Stem Cell Regeneration 10 2019 This book reviews the interface of stem cell biology and biomaterials for regenerative medicine. It presents the applications of biomaterials to support stem cell growth and differentiation. The book discusses the stem cell interactions' with nanofiber, gradient biomaterial, polymer- and ceramic biomaterials, integrating top-down and bottom-up approaches, adhesive properties of stem cells on materials, cell-laden hydrogels, nanospheres, de-cellularization techniques, and use of porous scaffolds. Further, this book provides a basic introduction to the fabrication techniques for creating various biomaterials that can be used for stem cell differentiation and differentiation. The book discusses the stem cell interactions' with nanofiber, gradient biomaterial, polymer- and ceramic biomaterials, integrating top-down and bottom-up approaches, adhesive properties of stem cells on materials, cell-laden hydrogels, nanospheres, de-cellularization techniques, and use of porous scaffolds. Further, this book provides a basic introduction to the fabrication techniques for creating various biomaterials that can be used for stem cell differentiation and differentiation. Further, the book reviews the latest applications of bio-instructive scaffold for supporting stem cell differentiation and tissue regeneration. The book also presents stem cell for dental, alveolar bone, and regeneration. Lastly, it introduces engineered stem cells for delivering small molecule therapeutics and their potential biomedical applications.

Fundamentals of the Stem Cell Debate 03 2020 "What the editors have managed to accomplish with Fundamentals of the Stem Cell Debate is very significant. The book is well-informed, sophisticated, and attends to the moral complexities of stem cell research, rather than sweeping them under the rug. This book encompasses the complexities without sacrificing the other main virtue of the collection: to definitively illuminate the debate for all."—Embryology, Epigenesis, & Evolution: Taking Development Seriously

Stem Cell Feb 17 2022 In this volume, the contributing authors from top labs involved in stem cell therapeutics share the latest advances in the field of stem cell research. The book covers many aspects of stem cell-based therapies that have made toward stem cell therapy for liver, ocular, and cardiovascular diseases as well as cancer. This volume serves as a continuation of Prof. Khawaja Hunsain Haider's previously edited books pertaining to stem cells-based therapies. The ideal book for researchers involved in drug development as well as regenerative medicine and stem cell-based therapy. The secondary audience includes graduate and postgraduate medical students, doctors, cellular pharmacologists, and researchers involved in using stem cells as ex-vivo disease models for drug development.

Principles of Stem Cell Biology and Cancer 03 2019 Principles of Stem Cell Biology and Cancer: Future Applications and Therapeutics Tarik Regad, The John van Geest Cancer Research Centre, Nottingham Trent University, UK, Thomas Sayers, Centre for Cancer Research, National Cancer Institute, Frederick, USA and Robert Rees The John van Geest Cancer Research Centre, Nottingham Trent University, UK The field of cancer stem cells is expanding rapidly, with a focus on isolating and identifying cancer stem cell populations. Although some progress has been made developing efficient cancer therapies, targeting cancer stem cells remains one of the important challenges facing the cancer research community. Principles of Stem Cell Biology and Cancer brings together original contributions from international experts in the field to present the very latest information linking stem cell biology and cancer. Divided into two parts, the book provides a detailed introduction to stem cell biology with a focus on the characterization of these cells, progress that has been made in their identification, as well as future therapeutic applications of stem cells. The second part of the book focuses on the role of cancer stem cells in cancer development, progression and chemo-resistance. This section of the book includes an overview of recent progress concerning therapies targeting cancer stem cells. Features: An authoritative introduction to stem cell biology and cancer. Includes contributions from leading international experts in the field. Well-illustrated with full colour figures throughout. This book will prove an invaluable resource for basic and applied researchers working on the development of new cancer treatments and therapies, providing a timely publication of high quality reviews outlining the current progress and exciting future possibilities for stem cell research.

Stem Cells Are Everywhere 03 2020 An engaging introduction to stem cells for young scientists How do you heal when you cut your skin or break a bone? How does your body keep making new blood or brain cells, or even new neurons? How does a plant keep growing larger? The answers lie in stem cells, which are found in every growing plant and animal. Keeping the subject simple enough for young readers, a pioneer of stem cell research explains cells, tissues, and organs, and how to fix it.

Stem Cell Epigenetics 30 2020 Stem Cell Epigenetics, Volume 16, examines how epigenetics are involved in stem cell differentiation, how a stem cell rapidly transitions into a molecularly distinct cell type, and how this process is managed via epigenetic reprogramming. Topics discussed include chromatin in pluripotency, epigenetic regulation of reprogramming, stem cells and DNA methylation, histone modifications in stem cells and differentiation, higher-order chromatin conformation in pluripotent cells, epigenetics and disease modeling, organoids from pluripotent cells, transcriptional regulation in stem cells and differentiation, non-coding RNAs in pluripotency and early differentiation, and epigenetic alterations in stem cells. Additionally, the potential implementation of stem cell epigenetics in drug discovery, regenerative medicine, and disease treatment is discussed in detail, helping researchers and physicians to translate this fast evolving field to the clinic. Provides genetic researchers, students and physicians with evidence indicating the epigenetic mechanisms involved in stem cell differentiation Highlights the specific characteristics of the epigenetic mechanisms that may result in disease pathogenesis Examines the potential application of stem cell epigenetics towards developing therapeutic interventions for disease and advancing regenerative medicine Features chapters by leading international experts

Stem Cells and Cell Therapy 26 2020 With the discovery of stem cells capable of multiplying indefinitely in culture and differentiating into many other cell types in appropriate conditions, new hopes were born in repair and regeneration of damaged cells and tissues. The features of stem cells may provide treatment for some incurable diseases with some therapies are already in clinics, particularly those from adult stem cells. Some treatments will require large numbers of stem cells, also require multiple doses, generating a growing demand for generating and processing large numbers of cells to meet the need of clinical applications. With this in mind, our aim is to provide a book on the subject of stem cells for researchers and students of cell biotechnology, bioengineering and bioproduction. This book is exceptional as it teaches researchers stem cells and cell therapy in that it covers the concepts and backgrounds necessary so that they have a clear understanding of the production of stem cells. The book covers three topics: The basics of stem cells and cell therapy, the use of stem cells for the treatment of human diseases, and stem cell processing. It includes chapters on stem cell biology, stem cell therapy, expansion engineering of embryonic stem cells, stem cell based production of blood cells and separation technologies for stem cells and cell therapy products. It is an informed and informative present research, science and engineering have learned about stem cells and their production and therapies. Addressing both the medical and production issues, this book is an invaluable contribution to having an academic and industrial perspective to R&D and manufacturing of clinical grade stem cells.

Bioethics and the Future of Stem Cell Research 03 2019 Despite years of heated social controversy over the use of human embryos in embryonic stem cell research, the caravan of stem cell science continues to proceed at an ever-increasing pace around the world. Bioethics and the Future of Stem Cell Research urges readers to look beyond the embryo debate to a much wider array of ethical issues in basic stem cell science and clinical translational research, including the use of induced pluripotent stem cells. Insoo Hyun offers valuable insights into complex ethical issues ranging from pre-clinical animal studies to clinical trials and stem cell tourism, all presented through a unique blend of philosophy and history of science, as well as with Dr Hyun's extensive practical experiences in international stem cell policy formation. This thoughtful book is an indispensable resource for anyone interested in the science of stem cells and the philosophical elements of research ethics.

Concepts and Applications of Stem Cell Biology 2021 This textbook will support graduate students with learning materials rich in the basic concepts of stem cell biology, in its most widespread and updated perspective. The concepts are conceived in a way for students to understand the meaning of pluripotency, the definition of embryonic stem cells and the formation of multicellular structures such as organoids together with the underlying principles of the stem cell biology, also discusses adult stem cells and the potential use of these cells, in particular neural, mesenchymal, and several types of muscular cells, in biomedical research and clinical applications. This textbook represents a vital component of the Essential Current Concepts of Stem Cell Biology, also published in the Learning Materials in Biosciences textbook series.

Regenerative Medicine and Stem Cell Biology 2021 This textbook covers the basic aspects of stem cell research and applications in regenerative medicine. Each chapter includes a didactic component and a practical section. The authors provide readers insights into: How to identify the basic concepts of stem cell biology and the molecular regulation of pluripotency and stem cell development. How to produce induced pluripotent stem cells (iPSCs) and the basics of stem cell biology of adult stem cells, with particular emphasis on mesenchymal stromal cells and hematopoietic stem cells, and the basic mechanisms that regulate them. How cancer stem cells arise and metastasize, and their properties. How to isolate, differentiate and characterize adult stem cells. The clinical significance of stem cell research and the potential problems that need to be overcome. Evaluating the use of stem cells for tissue engineering and therapies (both in vivo and in vitro) applications of bio-nanotechnology in stem cell research. How epigenetic mechanisms, including various DNA modifications and histone dynamics, are involved in regulating the potentiality and differentiation of stem cells. The ethical considerations and implications of stem cell research.

Biomaterials for Stem Cell Therapy 06 2022 Focused on stem cell applications, this book bridges the fields of biomaterials, offering new insights into constructing and regenerating tissues and organs. Its unique feature is linking stem cell biology to current thinking on how to deal with them in the context of current concepts and technologies by means of an in-depth focus on biomaterials. The book assembles recent advances and covers a range of topics in stem cell biology and biomaterials.

biomaterials and technological approaches such as bioreactors written by top researchers in the field. Stem cells of both embryonic and adult origin are discussed with applications ranging, but not limited to, nerve regeneration, trachea, cartilage and bone repair and cardiovascular therapy. Developments in the field reflecting the design and construction of the human body and its principal anatomy are discussed from a materials point of view. The book is a valuable tool for biomaterial scientists, tissue engineers, clinicians as well as stem cell biologists involved in basic research and applications of adult and embryonic stem cells. It will also be a source of reference for students in biotechnology, engineering, biology, biochemistry, materials sciences, pharmaceuticals, and veterinary and human medicine.

The Stem Cell Cure! Aug 11 2021 The 150+ year lifespan of our ancient ancestors can be achieved once again by harnessing the power of our own cells with The Stem Cell Cure! Renowned regenerative and restorative sports medicine expert Dr. Anand K. Goswami, M.D. provides advanced minimally invasive, non-surgical treatments to help his patients get back to peak performance levels - no matter their age. Harnessing the transformative power of stem cells is central to his approach. Stem cell therapy is proven to be effective in the treatment of many common conditions from arthritis and back pain to Alzheimer's, Parkinson's, and cancer. This book is an accessible and informative introduction to the amazing power of stem cell therapy - the biggest revolution in medicine since the discovery of penicillin, and a wave of the future. Co-authored by bestselling author and popular keynote speaker Kerry Johnson MBA PhD, The Stem Cell Cure provides step-by-step instructions to boost their health and vitality for a lifetime by recovering, regenerating, and repairing injuries and disease.

Stem Cells and the Future of Regenerative Medicine Jul 2022 Recent scientific breakthroughs, celebrity patient advocates, and conflicting religious beliefs have come together to bring the state of stem cell research 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 is applicable 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 pros and cons of 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 future of stem cell research, the important role of the federal government in this field of research, and other fundamental issues.

Stem Cells: An Insider's Guide Aug 23 2022 Stem Cells: An Insider's Guide is an exciting new book that takes readers inside the world of stem cells guided by international stem cell expert, Dr. Paul Knoepfler. Stem cells are catalyzing a revolution in medicine. The book also tackles the exciting and hotly debated area of stem cell treatments that are capturing the public's imagination. In the future they may also transform how we age and reproduce. However, there are significant challenges, too. The author's goal with this insider's guide is to give readers the information needed to distinguish between the ubiquitous hype and legitimate hope found throughout the stem cell world. The book answers the questions that people have about stem cells. Can stem cells help my family with a serious medical problem such as Alzheimer's, Multiple Sclerosis, or Autism? Are such treatments safe? Can stem cells make me look younger or even live longer? These questions and many more are answered here. A number of ethical issues related to stem cells that spark debates are discussed, including risky treatments, cloning and embryonic stem cells. The author breaks new ground by suggesting reforms to the FDA, providing a new theory of aging based on stem cells, and including a revolutionary Stem Cell Patient Bill of Rights. More generally, the book is your guide to where the stem cell research of the future as well as a thoughtful perspective on how stem cell therapies will ultimately change your life and our world.

Progenitor and Stem Cell Technologies and Therapies Oct 2021 Progenitor and stem cells have the ability to renew themselves and change into a variety of specialised types, making them ideal materials for therapy and regeneration. Progenitor and stem cell technologies and therapies reviews the range of progenitor and stem cells available and their therapeutic application. Part one reviews basic principles for the culture of stem cells before discussing particular cell types. These include human embryonic, induced pluripotent, amniotic and placental, cord and multipotent stem cells. Part two discusses wider issues such as intellectual property, regulation and commercialisation of stem cell technologies and therapies. The final part of the book considers the therapeutic use of stem and progenitor cells. Chapters review the use of adipose tissue-derived stem cells, umbilical cord blood (UCB) stem cells, bone marrow, auditory and olfactory stem cells. Other chapters cover the use of stem cells in therapies in various clinical areas, including lung, cartilage, urologic, nerve and cardiac repair. With its distinguished editor and international team of contributors, Progenitor and stem cell technologies and therapies is a standard reference for both those researching in cell and tissue biology and engineering as well as medical practitioners investigating the therapeutic use of this important technology. Reviews the range of available and outlines their therapeutic application Examines the basic principles for the culture of stem cells before discussing technologies for particular cell types, including human embryonic, induced pluripotent, amniotic and placental multipotent stem cells Includes a discussion of wider issues such as intellectual property, regulation and commercialisation of stem cell technologies and therapies

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