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Stem Cell Transcriptional Networks: Methods and Protocols collects techniques used to increase our understanding of the underlying transcriptional programs of stem cells that promote self-renewal and differentiation. The volume opens with a section on next-generation sequencing library preparation and data analysis. Continuing with a collection of protocols on visual analysis and interpretation of large-scale interaction networks, this detailed compilation features transcriptional networks in embryonic and adult stem cells, embryo culture and derivation of stem cells, as well as transcriptional programs that promote self-renewal, reprogramming, and transdifferentiation. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials, step-by-step, readily reproducible protocols and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Stem Cell Transcriptional Networks: Methods and Protocols aims to provide a key resource for biologists seeking to interrogate these vital networks.

The development of CRISPR-Cas technology is revolutionizing biology. Based on machinery bacteria use to target foreign nucleic acids, these powerful techniques allow investigators to edit nucleic acids and modulate gene expression more rapidly and accurately than ever before. Featuring contributions from leading figures in the CRISPR-Cas field, this laboratory manual presents a state-of-the-art guide to the technology. It includes step-by-step protocols for applying CRISPR-Cas-based techniques in various systems, including yeast, zebrafish, Drosophila, mice, and cultured cells (e.g., human pluripotent stem cells). The contributors cover web-based tools and approaches for designing guide RNAs that precisely target genes of interest, methods for preparing and delivering CRISPR-Cas reagents into cells, and ways to screen for cells that harbor the desired genetic changes. Strategies for optimizing CRISPR-Cas in each system--especially for minimizing off-target effects--are also provided. Authors also describe other applications of the CRISPR-Cas system, including its use for regulating genome activation and repression, and discuss the development of next-generation CRISPR-Cas tools. The book is thus an essential laboratory resource for all cell, molecular, and developmental biologists, as well as biochemists, geneticists, and all who seek to expand their biotechnology toolkits.

Animal fibres from South American camelids and other fibre or wool bearing species provide important products for use by the human population. The contemporary context includes the competition with petrocarbon-based artificial fibres and concern about excessive persistence of these in the natural environment. Animal fibres present highly valuable characteristics for sustainable production and processing as they are both natural and renewable. On the other hand, their use is recognised to depend on availability of appropriate quality and quantity, the production of which is underpinned by a range of sciences and processes which support development to meet market requirements. This collection of papers combines international experience from South and North America, China and Europe. The focus lies on domestic South American camelids (alpacas, llamas) and also includes research on sheep and goats. It considers latest advances in sustainable development under climate change, breeding and genetics, reproduction and pathology, nutrition, meat and fibre production and fibre metrology. Publication of this book is supported by the Animal Fibre Working Group of the European Federation of Animal Science (EAAP). 'Advances in Fibre Production Science in South American Camelids and other Fibre Animals' addresses issues of importance to scientists and animal breeders, textile processors and manufacturers, specialised governmental policy makers and students studying veterinary, animal and applied biological sciences.

While the science of yogurt is nearly as old as the origin of mankind, there have been rapid changes in yogurt development since the turn of the 19th century, fueled by continuing developments in biological sciences. Development and Manufacture of Yogurt and Other Functional Dairy Products presents a comprehensive review of all aspects of yogurt and other fermented dairy foods, including production, processing, preparation, regulations, and health aspects. Condensing more than 12,000 pages of recently published literature, expert contributors, including several clinicians, address the most recent developments in probiotics and the interaction between yogurt and immunological and intestinal bowel diseases. They explain how beneficial and harmful bacteria are colonized in the human intestinal system and how those bacteria can either strengthen or weaken immunological functions. This resource also explores the little-known varieties of functional dairy products – such as ayran, kefir, koumiss, cacik, and tarator – that are currently only consumed in small parts of the world but that are likely to reach supermarkets worldwide in the not-so-distant future. Development and Manufacture of Yogurt and Other Functional Dairy Products presents the most recent developments in biosciences and their applications in yogurt-human health interactions. The depth and breadth of coverage make this book an indispensable reference for those involved with the research and manufacturing of milk and dairy products.

This monograph examines the relationship between science and democracy. The author argues that there is no clear-cut division between science and the rest of society. Rather, scientists and laypeople form a single community of inquiry, which aims at the truth. To defend his theory, the author shows that science and society are both heterogeneous and fragmented. They display variable and shifting alliances between components. He also explains how information flow between science and society is bi-directional through “transactional” processes. In other words, science and society mutually define themselves. The author also explains how science is both objective and laden with values. Coverage includes a wide range of topics, such as: the ideal of value-free science, the is/ought divide, “thick terms” and the language of science, inductive risk, the dichotomy between pure science and applied science, constructivism and the philosophy of risk. It also looks at the concepts of truth and objectivity, the autonomy of science, moral and social inquiry, perfectionism and democracy, and the role of experts in democratic societies. The style is philosophical, but the book features many examples and case-studies. It will appeal to philosophers of science, those in science and technology studies as well as interested general readers.

Cancer and other genetic human diseases are caused by a variety of mutations, ranging from subtle sequence changes to larger genomic rearrangements and alterations in chromosome number (aneuploidy). With contributions by reputed experts, this book aims to update the knowledge on the multiple mechanisms of genomic instability leading to human disease. Emphasis is given to the different types of genomic sequences involved in disease-related genomic rearrangements as well as to the various exogenous factors increasing the frequency of mutations. Several chapters are dedicated to the dysfunction of important cellular mechanisms like DNA repair and chromosome segregation, which may cause genomic instability and result in tumorigenesis. Important 'caretaker' genes controlling the stability of our genome have been identified through their defect in genomic instability syndromes, which are also extensively reviewed in this volume. This book provides an important update not only for investigators in biology and medicine, but also for physicians and anyone interested in the molecular basis of human disease.

The rapid thriving of industries, conversion of agricultural land to residential areas, habitat destruction, deforestation and use of recalcitrant synthetic substances enhanced the rate of degradation of the environment. Although there are various conventional techniques for degradation and cleaning of noxious pollutants from disturbed environs, they are energy inefficient and costly to install. Bioremediation has emerged recently as an alternative and novel approach to manage and control environmental pollutants. This volume focuses explicitly on the remediation of noxious substances in stressed environs. It includes expert-contributed chapters on bio-monitoring by way of evaluating the relationship of biota with the polluted/stressed environs, sustainable plant-based degradation of noxious pollutants, and the application of biotechnologies to achieve tailored responses. Academicians, researchers, scientists and students will find this work essential for sustainable treatment of noxious pollutants. This book also serves as a core guide for training, teaching and research in conservation biology and environmental rehabilitation.

This book provides readers with a comprehensive overview of peroxisomes and their role in human diseases. It starts by describing the history of peroxisome research and then examines in detail the current understanding of the biogenesis and function of peroxisomes. It then focuses on peroxisomal disorders and the involvement of peroxisomes in cancer and age-related diseases, discussing in detail the use of model organisms to elucidate the pathogenesis of peroxisomal disorders and the physiological importance of peroxisomal proteins. Further, the book examines diagnostic and therapeutic strategies in peroxisomal disorders as well as significant recent advances. Lastly, it addresses various topics in peroxisome research, including the isolation of peroxisomes from mammalian tissues and cells, the structural biology of peroxisomal proteins, the lipidomics of peroxisomal disorders, the value of exome sequencing, and neuropsychological testing in X-linked adrenoleukodystrophy. Given its scope, the book is a valuable resource for postgraduate students and researchers in the life sciences and clinicians in the fields of internal medicine, pediatrics, and neurology.

This publication examines the opportunities and challenges, for business and government, associated with technologies bringing about the "next production revolution". These include a variety of digital technologies (e.g. the Internet of Things and advanced robotics), industrial biotechnology, 3D printing, new materials and nanotechnology. Some of these technologies are already used in production, while others will be available in the near future. All are developing rapidly. As these technologies transform the production and the distribution of goods and services, they will have far-reaching consequences for productivity, skills, income distribution, well-being and the environment. The more that governments and firms understand how production could develop in the near future, the better placed they will be to address the risks and reap the benefits.

This book provides the immune oncology (IO) community with a deeper understanding of the scope of the biomarker methods to potentially improve the outcome from immunotherapy. The editors secured the input from experts in the field dedicated to translating scientific research from bench to bedside was submitted. The book provides not only details about the technical, standardization and interpretation aspects of the methods but also introduces the reader to the background information and scientific justification for selected biomarkers and assays. 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 tips on troubleshooting and avoiding known pitfalls.

*Human Vaccines: Emerging Technologies in Design and Development* discusses the advances in molecular biology, biophysics, and informatics—among other disciplines—that have provided scientists with the tools to create new vaccines against emerging and re-emerging pathogens. For example, the virus-like particle technologies that led to licensing of highly efficacious HPV vaccines have only come into full realization in the last 10 years. Their success has, in turn, accelerated the pace with which nanoparticle vaccines are being developed. Given the rapidity with which the field is changing and the absence of any text documenting this change, there is a need for a resource that surveys these new vaccine technologies, assesses their potential, and describes their applications. This book provides that resource and complements traditional vaccinology books, but also serves as an excellent standalone for researchers and students with basic knowledge in immunology. Introduces new topics in vaccine immunology in the context vaccine design and production Consolidates the growing body of knowledge on new vaccine technologies that have only emerged in the past 2 – 3 decades Reviews the currently licensed vaccines that have utilized leading-edge technologies and how this has translated into improved efficacy and safety Provides a broad overview of innovative vaccine technologies, including immunological aspects

A handful of discoveries have changed the course of human history. This book is about the most recent and potentially the most powerful and dangerous of them all. It is an invention that allows us to rewrite the genetic code that shapes and controls all living beings with astonishing accuracy and ease. Thanks to it, the dreams of genetic manipulation have become a stark reality: the power to cure disease and alleviate suffering, to create new sources of food and energy, as well as to re-design any species, including humans, for our own ends. Jennifer Doudna is the co-inventor of this technology - known as CRISPR - and a scientist of worldwide renown. Writing with fellow researcher Samuel Sternberg, here she provides the definitive account of her discovery, explaining how this wondrous invention works and what it is capable of. She also asks us to consider what our new-found power means: how do we enjoy its unprecedented

benefits while avoiding its equally unprecedented dangers? The future of humankind - and of all life on Earth - is at stake. This book is an essential guide to the path that now lies ahead. Muscle disease represents an important health threat to the general population. There is essentially no cure. Gene therapy holds great promise to correct the genetic defects and eventually achieve full recovery in these diseases. Significant progresses have been made in the field of muscle gene therapy over the last few years. The development of novel gene delivery vectors has substantially enhanced specificity and efficiency of muscle gene delivery. The new knowledge on the immune response to viral vectors has added new insight in overcoming the immune obstacles. Most importantly, the field has finally moved from small experimental animal models to human patients. This book will bring together the leaders in the field of muscle gene transfer to provide an updated overview on the progress of muscle gene therapy. It will also highlight important clinical applications of muscle gene therapy.

Intensified agrarian and industrial activity has led to earth's soil and groundwater resources becoming polluted with hazardous materials. Bioremediation delivers a green technology using dynamics of living organisms, typically bacteria, fungi, microalgae and also plants to eliminate contaminants from ecosystem. This biological know-how is not only cost-effective compared to conventional physico-chemical approaches, but also very successful and is being employed in the field. This book focuses on important issues for several critical and common environmental pollutants, resulting in a compilation having recent updates on the bioremediation applications towards green and clean environment. This volume also describes updates on various novel approaches of bioremediation including nanotechnology, rhizomicrobiome technology, composting, metagenomics, and biosurfactants-based bioremediation. This volume is a resource for researchers, environmentalists, professionals and policy makers.

This open access book proposes a novel approach to Artificial Intelligence (AI) ethics. AI offers many advantages: better and faster medical diagnoses, improved business processes and efficiency, and the automation of boring work. But undesirable and ethically problematic consequences are possible too: biases and discrimination, breaches of privacy and security, and societal distortions such as unemployment, economic exploitation and weakened democratic processes. There is even a prospect, ultimately, of super-intelligent machines replacing humans. The key question, then, is: how can we benefit from AI while addressing its ethical problems? This book presents an innovative answer to the question by presenting a different perspective on AI and its ethical consequences. Instead of looking at individual AI techniques, applications or ethical issues, we can understand AI as a system of ecosystems, consisting of numerous interdependent technologies, applications and stakeholders. Developing this idea, the book explores how AI ecosystems can be shaped to foster human flourishing. Drawing on rich empirical insights and detailed conceptual analysis, it suggests practical measures to ensure that AI is used to make the world a better place.

This book will help readers navigate the complexity of mitochondrial disorders, by addressing the role of mitochondrial dysfunction and the complex pathophysiological mechanisms associated with a growing number of illnesses, not only of neurological interest. Further, it provides updated concepts on genotype-phenotype correlations, clinical syndromes, diagnostic algorithms and therapies. Written by the world's foremost mitochondrial researchers, the book comprehensively presents the state-of-the-art in mitochondrial medicine, making it of interest to a wide variety of specialists, including neurologists, geneticists, internists and biologists.

TNM Classification of Malignant Tumours, 7th Edition provides the latest, internationally agreed-upon standards to describe and categorize cancer stages and progression. Published in affiliation with the International Union Against Cancer (UICC), this authoritative guide contains important updated organ-specific classifications that oncologists and other professionals who manage patients with cancer need to accurately classify tumours for staging, prognosis and treatment. The major alterations addressed in the 7th Edition concern carcinomas of the oesophagus and the gastroesophageal junction, stomach, lung, appendix, biliary tract, skin, and prostate. In addition, there are several entirely new classifications: gastrointestinal carcinoids (neuroendocrine tumours) gastrointestinal stromal tumour upper aerodigestive mucosal melanoma Merkel cell carcinoma uterine sarcomas intrahepatic cholangiocarcinoma adrenal cortical carcinoma. A new approach has also been adopted to separate anatomical stage groupings from prognostic groupings in which other prognostic factors are added to T, N, and M categories. These new prognostic groupings, as well as the traditional anatomical groupings, are presented for oesophageal and prostate carcinomas. Visit [www.wileyanduicc.com](http://www.wileyanduicc.com) for more information about the International Journal of Cancer and our other UICC book titles

Gene therapy has the potential to be a tailor-made therapeutic with increased specificity and decreased side effects that can offer a "cure" for many disorders. The aim of this book is to provide up-to-date reviews of the rapidly growing field of gene therapy. Chapters cover a large range of topics including methods of gene delivery, and identification of targets with several papers on cancer gene therapy. If more people become aware of the true nature and potential of gene therapy, perhaps we can achieve the full benefit of such an innovative approach for the treatment of a range of diseases, including cancer.

In the view of most experts pharmacology is on drugs, targets, and actions. In the context the drug as a rule is seen as an active pharmaceutical ingredient and not as a complex mixture of chemical entities of a well defined structure. Today, we are becoming more and more aware of the fact that delivery of the active compound to the target site is a key. The present volume gives a topical overview on various modern approaches to drug targeting covering today's options for specific carrier systems allowing successful drug treatment at various sites of the body difficult to address and allowing to increase the benefit-risk-ratio to the optimum possible.

Neuroscience is, by definition, a multidisciplinary field: some scientists study genes and proteins at the molecular level while others study neural circuitry using electrophysiology and high-resolution optics. A single topic can be studied using techniques from genetics, imaging, biochemistry, or electrophysiology. Therefore, it can be daunting for young scientists or anyone new to neuroscience to learn how to read the primary literature and develop their own experiments. This volume addresses that gap, gathering multidisciplinary knowledge and providing tools for understanding the neuroscience techniques that are essential to the field, and allowing the reader to design experiments in a variety of neuroscience disciplines. Written to provide a "hands-on" approach for graduate students, postdocs, or anyone new to the neurosciences Techniques within one field are compared, allowing readers to select the best techniques for their own work Includes key articles, books, and protocols for additional detailed study Data analysis boxes in each chapter help with data interpretation and offer guidelines on how best to represent results Walk-through boxes guide readers step-by-step through experiments

This book provides up-to-date information on the state of the art in applications of biotechnological and microbiological tools for protecting the environment. Written by leading international experts, it discusses potential applications of biotechnological and microbiological techniques in solid waste management, wastewater treatment, agriculture, energy and environmental health. This first volume of the book "Environmental Microbiology and Biotechnology," covers three main topics: Solid waste management, Agriculture utilization and Water treatment technology, exploring the latest developments from around the globe regarding applications of biotechnology and microbiology for converting wastes into valuable products and at the same time reducing the environmental pollution resulting from disposal. Wherever possible it also includes real-world examples. Further, it offers advice on which procedures should be followed to achieve satisfactory results, and provides insights that will promote the transition to the sustainable utilization of various waste products.

Tumor Organoids Humana Press

This volume details protocols for the use of the biolistic DNA delivery method in different plant species. Chapters guide readers through non-protocol chapters that cover relevant topics of interest, a broad overview of the field, exciting modifications of the system, and reliable plant transformation procedures in different plant species. 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 tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Biolistic DNA Delivery: Methods and Protocols aims to provide a comprehensive collection of protocols to intended to be a practical guide for the novice as well as the advanced user in the field of plant genetic transformation.

Written and edited by leading cancer experts at Memorial Sloan Kettering Cancer Center, Pocket Oncology, Second Edition, is a practical, high-yield reference for trainees and practitioners of medical oncology and hematology. This easy-to-use, loose-leaf resource contains up-to-date information essential to caring for patients with cancer, from cancer biology, prevention, screening, treatment and supportive care to new advances in immuno-oncology and precision medicine.

Tumor Immunology and Immunotherapy - Integrated Methods Part B, Volume 636 in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. Chapters in this update include Quantification methods of Transforming Growth Factor beta (TGF $\beta$ ) activity in the setting of cancer immunotherapy, Decoding cancer cell death-driven immune cell recruitment: An in vivo method for site-of-vaccination analyses, Tracking and interrogating tissue-resident and recruited microglia in brain tumors, Metabolomics and lipidomics of the tumor microenvironment, Monitoring abscopal responses to radiation in mice, and much more.

Phytomanagement of Polluted Sites: Market Opportunities in Sustainable Phytoremediation brings together recent and established knowledge on different aspects of phytoremediation, providing this information in a single source that offers a cutting-edge synthesis of scientific and experiential knowledge on industrially contaminated site restoration that is useful for both practitioners and scientists. The book gives interested groups, both non-profit and for-profit, methods to manage dumpsites and other contaminated areas, including tactics on how to mitigate costs and even profit from ecological restoration. Covers successful examples of turning industrially contaminated sites into ecologically healthy revenue producers Explores examples of phytomanagement of dumpsites from around the globe Provides the tools the reader needs to select specific plant species according to site specificity

The Bacteria: Volume IX: Antibiotic-Producing Streptomyces explores how Streptomyces, including actinomycetes, produce a variety of antibiotics such as aminocyclitols, ansamycins, macrolides, and tetracyclines. Topics covered range from physiology and fermentation to genetic recombination and chromosome mapping in Streptomyces, biomodification of antibiotics by Streptomyces, and biosynthesis of tylosin and erythromycin. The genome structure and evolution of Streptomyces are also discussed. This volume is comprised of 10 chapters and begins with a discussion on the taxonomy of Streptomyces based on morphology, physiological characteristics, the composition of cell constituents such as cell walls, and the presence of characteristic lipids, sugars, and quinones. The discussion then turns to the intraspecific and interspecific recombination in Streptomyces; pathways of DNA repair and mutagenesis in Streptomyces fradiae; strategies for isolation of improved Streptomyces mutants for antibiotic production; and derivation of DNA cloning vectors from Streptomyces phages. The biology and use of Streptomyces plasmids as cloning vectors are also described. The final chapter is devoted to major structural classes of antibiotics produced by Streptomyces, including anthracyclines and other quinones,  $\beta$ -lactams, macrolides, nucleosides, peptides, polyenes, polyether antibiotics, and tetracyclines. This book will be of value to microbiologists, bacteriologists, biochemists, and biologists.

Responsible Innovation encourages innovators to work together with stakeholders during the research and innovation process, to better align the outcomes of innovation with the values, needs and expectations of society. Assessing the benefits and costs of Responsible Innovation is crucial for furthering the responsible conduct of science, technology and innovation. However, there is until now only limited academic work on Responsible Innovation assessment. This book fills this lacuna. Assessment of Responsible Innovation: Methods and Practices presents tools for measuring, monitoring, and reporting upon the Responsible Innovation process and the social, environmental, scientific, and economic impacts of innovations. These tools help innovators to mitigate risk and to strengthen their strategic planning. This book aligns assessment tools and practices with the UN Sustainable Development Goals (SDGs). The prospects as well as the limitations of various Responsible Innovation assessment approaches and tools are discussed, as well as their applicability in various industry contexts. The book brings together leading scholars in the field to present the most comprehensive review of Responsible Innovation tools. It articulates the importance of assessment and value creation, the different metrics and monitoring systems that can be deployed and the reporting mechanisms, including the importance of effective communication.

Cancer cell biology research in general, and anti-cancer drug development specifically, still relies on standard cell culture techniques that place the cells in an unnatural environment. As a consequence, growing tumor cells in plastic dishes places a selective pressure that substantially alters their original molecular and phenotypic properties. The emerging field of regenerative medicine has developed bioengineered tissue platforms that can better mimic the structure and cellular heterogeneity of in vivo tissue, and are suitable for tumor bioengineering research. Microengineering technologies have resulted in advanced methods for creating and culturing 3-D human tissue. By encapsulating the respective cell type or combining several cell types to form tissues, these model organs can be viable for longer periods of time and are cultured to develop functional properties similar to native tissues. This approach recapitulates the dynamic role of cell-cell, cell-ECM, and mechanical interactions inside the tumor. Further incorporation of cells representative of the tumor stroma, such as endothelial cells (EC) and tumor fibroblasts,

can mimic the in vivo tumor microenvironment. Collectively, bioengineered tumors create an important resource for the in vitro study of tumor growth in 3D including tumor biomechanics and the effects of anti-cancer drugs on 3D tumor tissue. These technologies have the potential to overcome current limitations to genetic and histological tumor classification and development of personalized therapies.

This multidisciplinary book provides up-to-date information on clinical approaches that combine stem or progenitor cells, biomaterials and scaffolds, growth factors, and other bioactive agents in order to offer improved treatment of urologic disorders including lower urinary tract dysfunction, urinary incontinence, neurogenic bladder, and erectile dysfunction. In providing clinicians and researchers with a broad perspective on the development of regenerative medicine technologies, it will assist in the dissemination of both regenerative medicine principles and a variety of exciting therapeutic options. After an opening section addressing current developments and future perspectives in tissue engineering and regenerative medicine, fundamentals such as cell technologies, biomaterials, bioreactors, bioprinting, and decellularization are covered in detail. The remainder of the book is devoted to the description and evaluation of a range of cell and tissue applications, with individual chapters focusing on the kidney, bladder, urethra, urethral sphincter, and penis and testis.

Exploring the diverse tools and technologies used to study synaptic processes, *The Dynamic Synapse: Molecular Methods in Ionotropic Receptor Biology* delineates techniques, methods, and conceptual advances for studying neurotransmitter receptors and other synaptic proteins. It describes a broad range of molecular, biochemical, imaging, and electrophysiological approaches for studying the biology of synapses. Specific topics include the use of proteomics to study synaptic protein complexes, the development of phosphorylation state specific antibodies, post-genomic tools applied to the study of synapses and RNA interference in neurons. In addition, several chapters focus on methods for gene and protein delivery into neuronal tissue. The use of biochemical, electrophysiological and optical tagging techniques to study the movement and membrane trafficking of neurotransmitter receptors in the membrane of live nerve cells are also discussed. To complement these approaches, the application of approaches for achieving long-term alterations in the genetic complement of neurons in vivo using viral vectors or homologous recombination of ES cells are also described.

IPOC Italian Paths of Culture is proud to offer a new printing of this excellent study, unsurpassed in its depth and significance. The building of a "knowledge-based society" necessarily implicates analysis and criticism of the relationship between society and techno-scientific innovation. If we maintain that the function of such innovation ought to be the general enrichment of human existence and not solely the profit of a few, then relevant discourse cannot be limited to scientists or politicians. The difficulty, in fact, lies not in discovery but in discovery's application. What are the ramifications of a discovery or innovation? What benefits does it bring with it? What world do we seek to build? The ability to make responsible choices for our planet and for future generations requires us to construct new forms of democratic debate in which all components of society have a voice. This study examines these issues and their implications.

There have been extraordinary developments in the field of neuroscience in recent years, sparking a number of discussions within the legal field. This book studies the various interactions between neuroscience and the world of law, and explores how neuroscientific findings could affect some fundamental legal categories and how the law should be implemented in such cases. The book is divided into three main parts. Starting with a general overview of the convergence of neuroscience and law, the first part outlines the importance of their continuous interaction, the challenges that neuroscience poses for the concepts of free will and responsibility, and the peculiar characteristics of a "new" cognitive liberty. In turn, the second part addresses the phenomenon of cognitive and moral enhancement, as well as the uses of neurotechnology and their impacts on health, self-determination and the concept of being human. The third and last part investigates the use of neuroscientific findings in both criminal and civil cases, and seeks to determine whether they can provide valuable evidence and facilitate the assessment of personal responsibility, helping to resolve cases. The book is the result of an interdisciplinary dialogue involving jurists, philosophers, neuroscientists, forensic medicine specialists, and scholars in the humanities; further, it is intended for a broad readership interested in understanding the impacts of scientific and technological developments on people's lives and on our social systems.

Research on gene drive systems is rapidly advancing. Many proposed applications of gene drive research aim to solve environmental and public health challenges, including the reduction of poverty and the burden of vector-borne diseases, such as malaria and dengue, which disproportionately impact low and middle income countries. However, due to their intrinsic qualities of rapid spread and irreversibility, gene drive systems raise many questions with respect to their safety relative to public and environmental health. Because gene drive systems are designed to alter the environments we share in ways that will be hard to anticipate and impossible to completely roll back, questions about the ethics surrounding use of this research are complex and will require very careful exploration. *Gene Drives on the Horizon* outlines the state of knowledge relative to the science, ethics, public engagement, and risk assessment as they pertain to research directions of gene drive systems and governance of the research process. This report offers principles for responsible practices of gene drive research and related applications for use by investigators, their institutions, the research funders, and regulators.

This detailed book encapsulates the most up-to-date methods of the intestinal stem cell field and provides guidance on a variety of techniques for studying intestinal stem cells properties. Beginning with a section on in vitro techniques to study different aspects of the intestinal stem cell functions by innovative imaging and functional assays, the volume continues with chapters detailing the single-cell transcriptional profiling method, the isolation of intestinal crypts to generate and establish 3D organoids, as well as different animal models of gastrointestinal cancer and examples of the use of in vivo methods for studying intestinal tumor-initiating cells or cancer stem cells. Written for the highly successful *Methods in Molecular Biology* series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and state-of-the-art, *Intestinal Stem Cells: Methods and Protocols* aims to provide comprehensive and easy to follow protocols designed to be helpful to both seasoned researchers and newcomers to this dynamic field.

The Handbook constitutes a global resource for the fast growing interdisciplinary research and policy communities addressing the challenge of driving innovation towards socially desirable outcomes. This book brings together well-known authors from the US, Europe and Asia who develop conceptual and regional perspectives on responsible innovation as well as exploring the prospects for further implementation of responsible innovation in emerging technological practices ranging from agriculture and medicine, to nanotechnology and robotics. The emphasis is on the socio-economic and normative dimensions of innovation including issues of social risk and sustainability.

Includes all the bells and whistles you and your students have come to expect It's hard to imagine a book more innovative and groundbreaking than Living with the Earth: Concepts in Environmental Health Science, Third Edition. The first edition won the CHOICE award for Outstanding Academic Book and both previous editions became bestsellers in their own right. See what's new and updated coverage includes: Emergency preparedness for environmental health practitioners including a discussion on their roles and operations Population dynamics, various cultural philosophies regarding overpopulation, and underpopulation in the developed nations Mechanisms of environmental disease with emphasis on genetic disease and developmental disorders Alternative to chemical pest control Genetic basis of cancer The growing problems of asthma and air pollutants as well as newly emerging and re-emerging infectious diseases An exploration of the mechanisms of toxicity, with special reference to the immune system and endocrine disruption Hazardous waste treatment, use, and recycling HACCP and assuring food quality, food safety issues, and Food Quality Protection Act Risk assessment and risk management principles A discussion in the change in directions in regulatory compliance Technical illustrations, charts, graphs, and photographs that improve learning and simplify concepts What's on the Web: Test bank and study questions Microsoft PowerPoint presentation slides in digital format Study guides with detailed notes, color figures, and tables Printable sample questions and answers for each chapter Search tools for online journals and databases covering useful, up-to-date information Incorporates traditional concepts with new, emerging, and controversial issues Always on the forefront of new ideas and new technology, the book includes up-to-date topics and information enhanced by Web features that make the book easy to use for professor and students alike.

A satellite symposium entitled "Myelination and Demyelination: Recent Chemical Advances" was held in Helsinki from August 29 to 31, 1977, after the Sixth International Meeting of the International Society for Neurochemistry (ISN) in Copenhagen. Myelin is a nervous tissue structure that is most suitable as a subject of biochemical investigation. It is easy to isolate in a highly purified form, is rather stable even after death, and is affected by a variety of neurological and other diseases. Its lesions are particularly important in the study of multiple sclerosis, a disease which is relatively prevalent in Finland and has therefore been of interest to a great many Finnish scientists. The first half of this book is concerned with the biochemical composition and molecular organization of myelin, the second half with the experimental and clinical aspects of demyelination. The comments given after each of the presentations at the symposium were not recorded as such, but each author was requested to modify his or her paper accordingly. The editing and publication of this book would not have been possible without the excellent efforts and co-operation of my wife, Mrs. L.-M. Palo, acting as general secretary and later as editorial secretary of the symposium. As Organizing Committee Chairman, I would also like to thank the members of the Committee: Dr. M. Haltia, Dr. E. Kivalo, Dr. T. Kosunen, Dr. M. Panelius, and especially Dr.

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