

Ib Biology 2012 Paper 1 Mark Scheme

This topical volume in the respected Encyclopedia series is the first in many years to bring together all important aspects of developmental biology in one source, from morphogenesis and organogenesis, via epigenetic regulation of gene expression to evolutionary developmental biology. The editor-in-chief has assembled an outstanding team of contributors to review these topics, creating an authoritative work for many years to come. The result is a unique, top-level reference in developmental biology for researchers, students and professionals alike.

This book reviews current science and applications in fields including thrombosis and hemostasis, signal transduction, and non-thrombotic conditions such as inflammation, allergy and tumor metastasis. It is a detailed, up-to-date, highly referenced text for clinical scientists and physicians, including recent developments in this rapidly expanding field. More than a scientific resource, this is also an authoritative reference and guide to the diagnosis.

This latest Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) will again form the standard reference for all those concerned with climate change and its consequences, including students, researchers and policy makers in environmental science, meteorology, climatology, biology, ecology, atmospheric chemistry and environmental policy.

There has been increased interest in circulating tumor cells (CTC), as a diagnostic readout of disease progression, and a tool for personalized medicine. The next generation of therapy for metastatic cancer may well involve neutralizing CTC as a means to prevent metastasis. In this topic we focus on recent research exploring this concept.

This book describes the strategy used for sequencing, assembling and annotating the tomato genome and presents the main characteristics of this sequence with a special focus on repeated sequences and the ancestral polyploidy events. It also includes the chloroplast and mitochondrial genomes. Tomato (*Solanum lycopersicum*) is a major crop plant as well as a model for fruit development, and the availability of the genome sequence has completely changed the paradigm of the species' genetics and genomics. The book describes the numerous genetic and genomic resources available, the identified genes and quantitative trait locus (QTL) identified, as well as the strong synteny across Solanaceae species. Lastly, it discusses the consequences of the availability of a high-quality genome sequence of the cultivated species for the research community. It is a valuable resource for students and researchers interested in the genetics and genomics of tomato and Solanaceae.

At the beginning of the 21st century, Antarctica is poised at the edge of a warmer and busier world. Leading Antarctic researchers examine the needs and challenges of Antarctic environmental management today and tomorrow. Through: (i) investigating the impacts of human activities on specific ecosystems and species, (ii) examining existing environmental management and monitoring practices in place in various regions and (iii) interrogating stakeholders, they address the following questions: What future will Business-As-Usual bring to the Antarctic environment? Will a Business-As-Usual future be compatible with the objectives set out under the Antarctic Treaty, especially its Protocol on Environmental Protection? What actions are necessary to

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bring about alternative futures for the next 50 years? This volume is an outcome of the International Polar Year (2007-2009) Oslo Science Conference (8-12, June, 2010). "Lays out the connections between conscious nutrition for families and spiritually oriented parenting including health advice and easy, child-friendly vegan recipes"-- This Technical Report presents the outcome of a Working Group that was established to determine broadly applicable sound exposure guidelines for fishes and sea turtles. After consideration of the diversity of fish and sea turtles, guidelines were developed for broad groups of animals, defined by the way they detect sound. Different sound sources were considered in terms of their acoustic characteristics and appropriate metrics defined for measurement of the received levels. The resultant sound exposure guidelines are presented in a set of tables. In some cases numerical guidelines are provided, expressed in appropriate metrics. When there were insufficient data to support numerical values, the relative likelihood of effects occurring was evaluated, although the actual likelihood of effects depends on the received level. These sound exposure guidelines, which are based on the best scientific information at the time of writing, should be treated as interim. The expectation is that with more research the guidelines can be refined and more cells in the tables completed. Recommendations are put forward defining the research requirements of highest priority for extending these interim exposure guidelines.

Over the past few decades the boom in the industrial sector has contributed to the release in the environment of pollutants that have no regulatory status and which may have significant impact on the health of animals and humans. These pollutants also refer as "emerging pollutants" are mostly aromatic compounds which derive from excretion of pharmaceutical, industrial effluents and municipal discharge. Some form of pollutions have also evolved, including the proliferation of acid mine drainage from oxidation or weathering of obsolete and unmanaged excavations around the world; this results mostly in the dispersion of inorganic pollutants in the environment at level surpassing the treatment capacity of conventional techniques. It is recurrent these days to find water treatment plants which no longer produce water that fits the purpose of domestic consumption based on newly established guidelines. This situation has prompted water authorities and researchers to develop tools for proper prediction and control of the dispersion of pollutants in the environment to ensure that appropriate measures are taken to prevent the occurrence of outbreaks due to sudden load of these pollutants in the water system. The chapters in this book cover a wide range of nano and bio-based techniques that have been designed for the real time detection of emerging contaminants in environmental water sources, geochemical models that are continuously improved for the prediction of inorganic contaminants migration from the mine solid wastes into ground and surface waters. Remediation strategies are also discussed and include effective techniques based on nanotechnology, advanced membrane filtration, oxidative and bio- degradation processes using various types of nanocatalysts, biocatalysts or supporting polymer matrices which are under advanced investigations for their implementation at large scale for the removal of recalcitrant pollutants from polluted water. This book is divided in two sections, the first section covers the occurrence of emerging pollutants in environmental water while the second section covers state of the art research on the removal of emerging pollutants from water using sustainable technologies. A total of 13 chapters addressing various topics

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related to the two sections are essentially based on recent development in the respective field which could have a significant impact on the enhancement of the performance of wastewater treatment plants around the world and especially in developing countries where access to clean and safe water remains a daily challenge. This authoritative volume provides a holistic picture of antibody-drug conjugates (ADCs). Fourteen comprehensive chapters are divided into six sections including an introduction to ADCs, the ADC construct, development issues, landscape, IP and pharmacoeconomics, case studies, and the future of the field. The book examines everything from the selection of the antibody, the drug, and the linker to a discussion of developmental issues such as formulations, bio-analysis, pharmacokinetic-pharmacodynamic relationships, and toxicological and regulatory challenges. It also explores pharmacoeconomics and intellectual properties, including recently issued patents and the cost analysis of drug therapy. Case studies are presented for the three ADCs that have received FDA approval: gemtuzumab ozogamicin (Mylotarg®), Brentuximab vedotin (Adcetris®), and ado-trastuzumab emtansine (Kadcyla®), as well as an ADC in late-stage clinical trials, glembatumumab vedotin (CDX-011). Finally, the volume presents a perspective by the editors on the future directions of ADC development and clinical applications. Antibody-Drug Conjugates is a practical and systematic resource for scientists, professors, and students interested in expanding their knowledge of cutting-edge research in this exciting field.

When we think of "climate change," we think of man-made global warming, caused by greenhouse gas emissions. But natural climate change has occurred throughout human history, and populations have had to adapt to the climate's vicissitudes. Anthony J. McMichael, a renowned epidemiologist and a pioneer in the field of how human health relates to climate change, is the ideal person to tell this story. *Climate Change and the Health of Nations* shows how the natural environment has vast direct and indirect repercussions for human health and welfare. McMichael takes us on a tour of human history through the lens of major transformations in climate. From the very beginning of our species some five million years ago, human biology has evolved in response to cooling temperatures, new food sources, and changing geography. As societies began to form, they too adapted in relation to their environments, most notably with the development of agriculture eleven thousand years ago. Agricultural civilization was a Faustian bargain, however: the prosperity and comfort that an agrarian society provides relies on the assumption that the environment will largely remain stable. Indeed, for agriculture to succeed, environmental conditions must be just right, which McMichael refers to as the "Goldilocks phenomenon." Global warming is disrupting this balance, just as other climate-related upheavals have tested human societies throughout history. As McMichael shows, the break-up of the Roman Empire, the bubonic Plague of Justinian, and the mysterious collapse of Mayan civilization all have roots in climate change. Why devote so much analysis to the past, when the daunting future of climate change is already here? Because the story of mankind's previous survival in the face of an unpredictable and unstable climate, and of the terrible toll that climate change can take, could not be more important as we face the realities of a warming planet. This sweeping magnum opus is not only a rigorous, innovative, and fascinating exploration of how the climate affects the human condition, but also an urgent call to recognize our species' utter reliance on the earth as it is.

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Winner of the IENE Project Award 2016. This authoritative volume brings together some of the world's leading researchers, academics, practitioners and transportation agency personnel to present the current status of the ecological sustainability of the linear infrastructure – primarily road, rail and utility easements – that dissect and fragment landscapes globally. It outlines the potential impacts, demonstrates how this infrastructure is being improved, and how broad ecological principles are applied to mitigate the impact of road networks on wildlife. Research and monitoring is an important aspect of road ecology, encompassing all phases of a transportation project. This book covers research and monitoring to span the entire project continuum – starting with planning and design, through construction and into maintenance and management. It focuses on impacts and solutions for species groups and specific regions, with particular emphasis on the unique challenges facing Asia, South America and Africa. Other key features: Contributions from authors originating from over 25 countries, including from all continents Each chapter summarizes important lessons, and includes lists of further reading and thoroughly up to date references Highlights principles that address key points relevant to all phases in all road projects Explains best-practices based on a number of successful international case studies Chapters are "stand-alone", but they also build upon and complement each other; extensive cross-referencing directs the reader to relevant material elsewhere in the book Handbook of Road Ecology offers a comprehensive summary of approximately 30 years of global efforts to quantify the impacts of roads and traffic and implement effective mitigation. As such, it is essential reading for those involved in the planning, design, assessment and construction of new roads; the management and maintenance of existing roads; and the modifying or retrofitting of existing roads and problem locations. This handbook is an accessible resource for both developed and developing countries, including government transportation agencies, Government environmental/conservation agencies, NGOs, and road funding and donor organisations.

The new edition of this brief introductory text retains the hallmark features that have made its parent text unique, while offering a more manageable, student-friendly format. The book was written with three goals in mind: to make the study of psychology accessible and engaging to the beginning student in psychology, to provide students with a solid grounding in the knowledge base in psychology, and to help students succeed in the course. Nevid's comprehensive learning system-derived from research on memory, learning, and textbook pedagogy-is featured throughout. This learning model incorporates what the author calls the Four E's of Effective Learning-Engaging Student Interest, Encoding Information, Elaborating Meaning, and Evaluating Progress. ESSENTIALS OF PSYCHOLOGY: CONCEPTS AND APPLICATIONS, 4th Edition, provides a broad view of psychology as well as applications of the knowledge gained from contemporary research to the problems and challenges we face in today's world. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

In 150 years Italy transformed itself from a poor and backward country into one where living standards are among the highest in the world. In Measuring Wellbeing, Giovanni Vecchi provides an innovative analysis of this change by drawing on family accounts that provide engaging insights into life and are the "micro" data that create the foundations for the "macro" picture of variations and fluctuations in the development of

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Italy. Vecchi provides a nuanced account of the changes. He emphasizes that the concept of wellbeing is multidimensional and must include non-monetary aspects of life: nutrition, health and education, as well as less tangible elements such as freedom or the possibility to exercise one's political rights. The book deals with this polyhedral nature of wellbeing. Among the insights are that Italians succeeded in combining growth with equity, but that the gap between the North and South did not narrow; the while longevity has increased, education has not improved as much as it could have; and that for close to three decades, Italy's virtuous path has come to a halt: the wellbeing of the Italian people is at the crossroads between progress and decline. *Measuring Wellbeing* engagingly combines a unique dataset and an innovative statistical method that can be adapted to other countries.

Officials and religious scholars in the Gulf states have repeatedly banned the teaching of the theory of evolution because of its association with atheism. But Jorg Matthias Determann argues here that, despite official prohibition, research on biological evolution has flourished, due in large part to the development of academic and professional networks. This book traces these networks through the history of various branches of biology, including botany, conservation research, ornithology and palaeontology. Typical of rentier societies, some of the scientific networks in this region consist of vertical patron-client relationships. For example, those in power who are interested in wildlife conservation have been known to offer patronage to biologists working on desert ecology. However, just as important are the horizontal links between scientists both within the Gulf region and beyond. Given the strengths and importance of these two forms of professional networks, Determann argues that we should look at the Arab world as an area interconnected with global science, and therefore fully integrated into the scientific and technological advances being pioneered worldwide."

Provide clear guidance to the 2014 changes and ensure in-depth study with accessible content, directly mapped to the new syllabus and approach to learning. This second edition of the highly regarded textbook contains all SL and HL content, which is clearly identified throughout. Options are available free online, along with appendices and data and statistics. - Improve exam performance, with exam-style questions, including from past papers - Integrate Theory of Knowledge into your lessons and provide opportunities for cross-curriculum study - Stretch more able students with extension activities - The shift to concept-based approach to learning , Nature of Science, is covered by providing a framework for the course with points for discussion - Key skills and experiments included

Biological evolution is a fact—but the many conflicting theories of evolution remain controversial even today. When *Adaptation and Natural Selection* was first published in 1966, it struck a powerful blow against those who argued for the concept of group selection—the idea that evolution acts to select entire species rather than individuals. Williams's famous work in favor of simple Darwinism over group selection has become a classic of science literature, valued for its thorough and convincing argument and its relevance to many fields outside of biology. Now with a new foreword by Richard Dawkins, *Adaptation and Natural Selection* is an essential text for understanding the nature of scientific debate.

The Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 6th Edition provides the most current and authoritative guidance on selecting, performing, and evaluating the results of new and established laboratory tests. This classic clinical chemistry reference offers encyclopedic coverage detailing everything you need to know, including: analytical criteria for the medical usefulness of laboratory tests, variables that affect tests and results, laboratory medicine, applications of statistical methods, and most importantly clinical utility and interpretation of laboratory tests. It is THE definitive reference in clinical chemistry and molecular diagnostics, now fully searchable and with quarterly content updates, podcasts,

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clinical cases, animations, and extended content online through Expert Consult. Analytical criteria focus on the medical usefulness of laboratory procedures. Reference ranges show new approaches for establishing these ranges — and provide the latest information on this topic. Lab management and costs gives students and chemists the practical information they need to assess costs, allowing them to do their job more efficiently and effectively. Statistical methods coverage provides you with information critical to the practice of clinical chemistry.

Internationally recognized chapter authors are considered among the best in their field. Two-color design highlights important features, illustrations, and content to help you find information easier and faster. NEW! Internationally recognized chapter authors are considered among the best in their field. NEW! Expert Consult features fully searchable text, quarterly content updates, clinical case studies, animations, podcasts, atlases, biochemical calculations, multiple-choice questions, links to Medline, an image collection, and audio interviews. You will now enjoy an online version making utility of this book even greater. UPDATED! Expanded Molecular Diagnostics section with 12 chapters that focus on emerging issues and techniques in the rapidly evolving and important field of molecular diagnostics and genetics ensures this text is on the cutting edge and of the most value. NEW! Comprehensive list of Reference Intervals for children and adults with graphic displays developed using contemporary instrumentation. NEW! Standard and international units of measure make this text appropriate for any user — anywhere in the world. NEW! 22 new chapters that focus on applications of mass spectrometry, hematology, transfusion medicine, microbiology, biobanking, biomarker utility in the pharmaceutical industry and more! NEW! Expert senior editors, Nader Rifai, Carl Wittwer and Rita Horvath, bring fresh perspectives and help ensure the most current information is presented. UPDATED! Thoroughly revised and peer-reviewed chapters provide you with the most current information possible.

This Combo Package, prepared by CBSE Exam experts at Jagranjosh.com, is a kind of must have for the students appearing for Class 12th Biology Paper in the coming CBSE Board 2018 Exam. 1. This Combo Package includes: • CBSE Class 12 Biology Solved Question Paper 2017 • CBSE Class 12 Biology Solved Question Paper 2016 (Set-3) • CBSE Class 12 Biology Solved Question Paper 2015 (Set-2) • CBSE Class 12 Biology Solved Question Paper 2014 (Set-1) • CBSE Class 12 Biology Solved Question Paper 2013 (Set-1) • CBSE Class 12 Biology Solved Question Paper 2012 (Set-1) 2. The Package strictly follows the pattern of CBSE Class 12th Syllabus. 3. It also contains the detailed explanation for each question solved. 4. It will help you strengthen the concepts at class 12th level. 5. This Package will surely Build your confidence to score excellent marks in following Board Exam Paper. Key Feature Free Class 12th Biology 2012 Solved Paper ebook Ideal to understand the exam pattern Will give a clear idea of how to study and what to study for the exam

NETosis is a unique form of cell death that is characterized by the release of decondensed chromatin and granular contents to the extracellular space. The initial observation of NETosis placed the process within the context of the innate immune response to infections. Neutrophils, the most numerous leukocytes that arrive quickly at the site of an infection, were the first cell type shown to undergo extracellular trap formation. However, subsequent studies showed that other granulocytes are also capable of releasing nuclear chromatin following stimulation. The extracellular chromatin acts to immobilize microbes and prevent their dispersal in the host. Bacterial breakdown products and inflammatory stimuli induce NETosis and the release of NETs requires enzyme activities. Histones in NET chromatin become modified by peptidylarginine deiminase 4 (PAD4) and cleaved at specific sites by proteases. NETs serve for attachment of bactericidal enzymes including myeloperoxidase, leukocyte proteases, and the cathelicidin LL-37. While the benefit of NETs in an infection appears clear, NETs also figure prominently at the center of various pathologic states. Therefore, it is important for NETs to be efficiently cleared; else digestive enzymes may gain access to tissues where

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inflammation takes place. Persistent NET exposure at sites of inflammation may lead to a further complication: NET antigens may provoke acquired immune responses and, over time, could initiate autoimmune reactions. Recent studies identified aberrant NET synthesis and/or clearance in inflammatory/autoimmune conditions such as systemic lupus erythematosus (SLE), psoriasis, ANCA-positive vasculitis, gout and Felty's syndrome. In the case of SLE, for example, it appears that LL-37 exposed in the NETs may be a significant trigger of type I Interferon responses in this disease. Recent evidence also implicates aberrant NET formation in the development of endothelial damage, atherosclerosis and thrombosis. NETosis is thus of interest to researchers who investigate innate immune responses, host-pathogen interactions, chronic inflammatory disorders, cell and vascular biology, biochemistry, and autoimmunity. As we approach the 10-year-anniversary of the initial discovery of NETosis, it is useful and timely to review the so far identified mechanisms and pathways of NET formation, their role in bacterial and fungal defense and their putative importance as inducers of autoimmune responses. We look forward to a rich and rigorous discussion of these and related issues that benefit from interdisciplinary approaches, collaborations and exciting discoveries.

Gleaning information from more than 100 experts in the field of cancer diagnosis, prognosis, and therapy worldwide, *Cancer Biomarkers: Non-Invasive Early Diagnosis and Prognosis* determines the significance of clinical validation approaches for several markers. This book examines the use of noninvasive or minimally invasive molecular cancer markers that are under development or currently in use. It deals with a majority of commonly prevalent cancers and can help anyone working in the health-care industry to recommend or develop early diagnostics, at-risk tests, and prognostic biomarkers for various cancers. It explores the practice of determining biomarkers by their characteristics and relative methodologies, and presents the most recent data as well as a number of current and upcoming early diagnostic noninvasive molecular markers for many common cancers. It also considers the sensitivity and specificity of markers, biomarker market, test providers, and patent information. Approximately 30-35 Cancer Specific Noninvasive Molecular Diagnostic Markers in a Single Volume The book details the general and technical aspects of noninvasive cancer markers. It covers imaging, cutting-edge molecular technologies for biomarker development, and noninvasive or minimally invasive sources of molecular markers, as well as quality control and ethical issues in cancer biomarker discovery. It also provides a detailed account of brain, head and neck, and oral cancer markers, and provides information on a number of gastrointestinal cancers, lung cancer, and mesothelioma markers. Emphasizes the Importance of Volatile Markers in Early Cancer Diagnosis Presents noninvasive early molecular markers in urological cancers Describes gynecological and endocrine cancer markers Details noninvasive markers of breast, ovarian, cervical, and thyroid cancers Addresses hematological malignancies Contains information on noninvasive molecular markers in myelodysplastic syndromes, acute myeloid leukemia, Hodgkin's lymphoma, and multiple myeloma Provides comprehensive information on diagnostic and prognostic biomarkers in cutaneous melanoma This text considers molecular technologies for biomarker development, noninvasive or minimally invasive sources of molecular markers, and quality control and ethical issues in cancer biomarker discovery. An ideal reference guide to introducing the IB Diploma in your school.

Everything you need to navigate the IB Diploma Psychology course; ensure full coverage of the syllabus with a comprehensive guide to all the concepts, theories and research into approaches to understanding behaviour, presented with a cross-cultural focus for global thinkers. · Develop critical analysis skills with critical thinking boxes to draw out methodological issues from studies, and the TOK feature to help you recognise debates and issues. · Apply new skills and knowledge to everyday life with examples and case studies. · Navigate your way seamlessly through the course with key studies and terms highlighted. · Assess your progress and learning with summaries at the end of each chapter.

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Development of powerful new high-throughput technologies for probing the transcriptome, proteome and metabolome is driving the rapid acquisition of information on the function of molecular systems. The importance of these achievements cannot be understated – they have transformed the nature of both biology and medicine. Despite this dramatic progress, one of the greatest challenges that continues to confront modern biology is to understand how behavior at the level of genome, proteome and metabolome determines physiological function at the level of cell, tissue and organ in both health and disease. Because of the inherent complexity of biological systems, the development, analysis, and validation of integrative computational models based directly on experimental data is necessary to achieve this understanding. This approach, known as systems biology, integrates computational and experimental approaches through iterative development of mathematical models and experimental validation and testing. The combination of these approaches allows for a mechanistic understanding of the function of complex biological systems in health and their dysfunction in disease. The National Heart, Lung, and Blood Institute (NHLBI) has recognized the importance of the systems biology approach for understanding normal physiology and perturbations associated with heart, lung, blood, and sleep diseases and disorders. In 2006, NHLBI announced the Exploratory Program in Systems Biology, followed in 2010 by the NHLBI Systems Biology Collaborations. The goal of these programs is to support collaborative teams of investigators in using experimental and computational strategies to integrate the component parts of biological networks and pathways into computational models that are based firmly on and validated using experimental data. These validated models are then applied to gain insights into the mechanisms of altered system function in disease, to generate novel hypotheses regarding these mechanisms that can be tested experimentally, and to then use the results of experiments to refine the models. The purpose of this Research Topic is to present the range of innovative, new approaches being developed by investigators working in areas of systems biology that couple experimental and modeling studies to understand the cause and possible treatment of heart, lung, blood and sleep diseases and disorders. This Research Topic will be of great interest to the cardiovascular research community as well as to the general community of systems biologists.

U.S. foreign agricultural assistance investments bring substantial economic, health, and security benefits to both developing countries and the United States. This report describes the food security investments of the U.S. Agency for International Development and how improving agriculture in developing countries brings positive returns to the United States and developing countries. The multiple benefits of foreign agricultural assistance include growth of agri-food systems of developing countries, and positive impacts on U.S. jobs and exports, technology spillovers that support U.S. agricultural production, health and nutrition of U.S. consumers, and global and U.S. security.

This publication is part of a series of six country reports on technical and vocational education and training (TVET) and higher education in Bangladesh, Nepal, and Sri Lanka. Each report presents current arrangements and initiatives in the respective country's skills development strategies. These are complemented by critical analyses to determine key issues, challenges, and opportunities for innovative strategies toward global competitiveness, increased productivity, and inclusive growth. The emphasis is to make skills training more relevant, efficient, and responsive to emerging domestic and international labor markets. The reports were finalized in 2013 under the Australian AID-supported Phase 1 of Subproject 11 (Innovative Strategies for Accelerated Human Resource Development) of Regional Technical Assistance 6337 (Development Partnership Program for South Asia).

Advances in geomicrobiology have progressed at an accelerated pace in recent years. Ehrlich's Geomicrobiology, Sixth Edition surveys various aspects of the field, including the microbial role in elemental cycling and in the formation and degradation of minerals and fossil

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fuels. Unlike the fifth edition, the sixth includes many expert contributors

Sirtuins comprise a family of NAD⁺-dependent enzymes that have been shown to impact longevity in a number of eukaryotic organisms. Sir2 (Silent Information Regulator 2) was the first sirtuin protein discovered. The discovery that Sir2 requires NAD⁺ for its activity suggested a link between Sir2 activity and the phenomenon of caloric restriction in prolonging longevity. This link was strengthened by the observation that lifespan extension by caloric restriction requires Sir2 protein. Under conditions of caloric restriction, NAD⁺ levels are high, Sir2 is activated, and the rate of aging is decreased. These effects have been replicated in invertebrate organisms, where a close structural and functional homologue of Sir2 was found in *C. elegans* and *Drosophila*. The sirtuin-dependent effects on metabolism and ageing, observed in lower organisms, have ignited intensive investigation of their biological and therapeutic roles in mammals. There are seven known mammalian sirtuins, SIRT1-7, the most studied of which is SIRT1, a close structural and functional homologue of yeast Sir2. Enhancement of organismal longevity and other health-promoting effects of mammalian SIRT1 have frequently been attributed to the regulation of metabolism. A recognized molecular link between metabolism and aging stimulated a firestorm of investigations, aiming to combat metabolic and age-dependent human diseases. It has become clear, however, that the sirtuin family of proteins regulates a diverse repertoire of cellular functions in mammals. Mounting evidence implicating SIRT1 in important clinical indications, such as diabetes, cancer, cardiovascular dysfunction and neurodegenerative disease, suggest that modality as attractive therapeutic target. Subsequently, drug discovery and development, targeting sirtuin activation, has been intensified in the recent years. Despite rapid progress and accumulation of new data, the biological roles of other mammalian sirtuins have been less studied and remain poorly understood. There are several important questions that remain to be addressed. What are the functions of sirtuins in different cell types and tissues? Are all sirtuins involved in the regulation of metabolism and aging? What is the functional relationship between different sirtuins? What are the mechanisms of regulation of sirtuin activities? What is the role of sirtuins in disease and therapy? This issue aims to address these and other critical questions, relevant to Research Topic on sirtuin biology and therapeutics. To that end the issue solicits expert opinions of sirtuin research on structural biology, biochemistry, cell biology, animal genetics, pharmacology, medicinal chemistry and drug discovery, and on areas of investigation studying human conditions, like diabetes, cancer, cardio-vascular, and neurodegeneration. Of particular interest are the new methods and assays to study sirtuins in various organisms and developing sirtuin-based therapeutics. Furthermore, we propose to encourage contributors to discuss new concepts and paradigms, and to express their perspectives on the future development of the sirtuin research field. Altogether, we believe this issue provides a unique opportunity for comprehensive and diverse coverage of the topic, and will be of broad interest for the journal's readership.

Technological advances in thermal imaging have had far-reaching impacts on the fields of biology and medicine. By studying the diverse applications in thermal imaging, significant contributions can be made in modern life sciences. Innovative Research in Thermal Imaging for Biology and Medicine is a thorough reference source that offers in-depth discussions on emerging advancements in thermal imaging techniques and provides interdisciplinary perspectives on its diverse applications. Highlighting relevant topics such as microvascular imaging, vascular optics, body cryotherapy, and myofascial trigger points, this publication is ideal for all academicians, graduate students, practitioners, and researchers who are interested in studying the latest advances in thermal imaging as it relates to medicine and biology.

The product of 20 years of research, this book covers topics in soft tissue elasticity in vivo, from measurement techniques to clinical applications. It provides, for the first time, a single

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source that systematically introduces the various techniques for in vivo measurement of soft tissue elasticity in an effort to ease the difficulty between lea

Encyclopedia of the World's Biomes is a unique, five volume reference that provides a global synthesis of biomes, including the latest science. All of the book's chapters follow a common thematic order that spans biodiversity importance, principal anthropogenic stressors and trends, changing climatic conditions, and conservation strategies for maintaining biomes in an increasingly human-dominated world. This work is a one-stop shop that gives users access to up-to-date, informative articles that go deeper in content than any currently available publication. Offers students and researchers a one-stop shop for information currently only available in scattered or non-technical sources Authored and edited by top scientists in the field Concisely written to guide the reader though the topic Includes meaningful illustrations and suggests further reading for those needing more specific information

Developing Solid Oral Dosage Forms: Pharmaceutical Theory and Practice, Second Edition illustrates how to develop high-quality, safe, and effective pharmaceutical products by discussing the latest techniques, tools, and scientific advances in preformulation investigation, formulation, process design, characterization, scale-up, and production operations. This book covers the essential principles of physical pharmacy, biopharmaceutics, and industrial pharmacy, and their application to the research and development process of oral dosage forms. Chapters have been added, combined, deleted, and completely revised as necessary to produce a comprehensive, well-organized, valuable reference for industry professionals and academics engaged in all aspects of the development process. New and important topics include spray drying, amorphous solid dispersion using hot-melt extrusion, modeling and simulation, bioequivalence of complex modified-released dosage forms, biowaivers, and much more. Written and edited by an international team of leading experts with experience and knowledge across industry, academia, and regulatory settings Includes new chapters covering the pharmaceutical applications of surface phenomenon, predictive biopharmaceutics and pharmacokinetics, the development of formulations for drug discovery support, and much more Presents new case studies throughout, and a section completely devoted to regulatory aspects, including global product regulation and international perspectives

The mission of the International Journal of Educational Reform (IJER) is to keep readers up-to-date with worldwide developments in education reform by providing scholarly information and practical analysis from recognized international authorities. As the only peer-reviewed scholarly publication that combines authors' voices without regard for the political affiliations perspectives, or research methodologies, IJER provides readers with a balanced view of all sides of the political and educational mainstream. To this end, IJER includes, but is not limited to, inquiry based and opinion pieces on developments in such areas as policy, administration, curriculum, instruction, law, and research. IJER should thus be of interest to professional educators with decision-making roles and policymakers at all levels turn since it provides a broad-based conversation between and among policymakers, practitioners, and academicians about reform goals, objectives, and methods for success throughout the world. Readers can call on IJER to learn from an international group of reform implementers by discovering what they can do that has actually worked. IJER can also help readers to understand the pitfalls of current reforms in order to avoid making similar mistakes. Finally, it is the mission of IJER to help readers to learn about key issues in school reform from movers and shakers who help to study and shape the power base directing educational reform in the U.S. and the world. Presents a multifaceted model of understanding, which is based on the premise that people can demonstrate understanding in a variety of ways.

The analysis of urban development of the past twenty years presented in this maiden edition of the World Cities Report shows, with compelling evidence, that there are new forms of collaboration and cooperation, planning, governance, finance and learning that can sustain

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positive change. The Report unequivocally demonstrates that the current urbanization model is unsustainable in many respects. It conveys a clear message that the pattern of urbanization needs to change in order to better respond to the challenges of our time, to address issues such as inequality, climate change, informality, insecurity, and the unsustainable forms of urban expansion.

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