Book Reviews

Editorial Policy. Recently published books and journals (one copy) are invited by the Editorial Office for announcement and review in ANTICANCER RESEARCH (no fee). Each announcement should include the full title of the publication, authors or editors, the number of pages, price, year of publication, ISBN and publisher. Publishers will be notified upon receipt of books and tear sheets of reviews will be sent after publication. Books will be returned to the sender only if the announcement is rejected. Reviews will be objective and clear regarding the content, quality and usefulness of the publication.

The Ultrastructure of Human Tumours. Applications in Diagnosis and Research.

By B. Eyden, S. Sarkar Banerjee, Y. Ru, P. Liberski. 2013, pp 680, Eur 166.39, ISBN: 978-3-642-39167-5. Zhejiang University Press, Hangzhou and Springer-Verlag, Berlin, Germany.

This volume describes the core features as seen by transmission electron microscopy, defining the different types of cellular differentiation in tumours; this is relevant for tumour nomenclature and diagnosis, which, in turn, are important for tumour pathologists in their collaboration with oncologists for the treatment of cancer patients. The book is divided into 8 chapters. Following an introduction on technique and procedure, there are chapters on epithelial tumours, melanocytic lesions, soft-tissue and related tumours, lymphoma and leukaemia, CNS neoplasms and neuroendocrine and neuronal tumours. Each chapter includes an introductory text that puts the ultrastructural features in the context of classical pathology. The book includes many new findings and interpretations from well-known tumours, as well as ultrastructural information on several newly described tumour entities not dealt with in existing tumour ultrastructure monographs. The book will especially be of value to tumour pathologists who need to solve problem cases with the aid of electron microscopy, but also to cancer research and tissue engineering scientists working to develop anti-cancer and stem-cell-based therapies. However, even those without access to electron microscopy may also benefit from this book, since many of the images provide an 'explanation' of the appearances of cells, tissues and tumours familiar to pathologists and scientists from light microscopy. In this respect, it is hoped that this book will stimulate the wider use of electron microscopy in pathology. The book is comprehensively referenced, 680 pages long and lavishly illustrated with 757 figures.

Molecular Oncology Testing for Solid Tumors. A Pragmatic Approach.

Edited by M.O. Idowu, C.I. Dumur, C.T. Garrett. 2015, pp 742, Eur 124.79, ISBN: 978-3-319-16303-1. Springer International Publishing, Cham, Switzerland.

This text is designed to present an up-to-date practical approach to molecular testing in an easy to understand format. Emphasis is placed on molecular testing for solid tumors, while underscoring the following: i) the crucial role of pathologists in ensuring specimen adequacy for molecular testing; ii) current molecular assays/platforms (including next-generation sequencing); iii) clinical utility and limitations of biomarkers to enable effective communication with clinicians; iv) the importance of quality assurance metrics to ensure accurate and reproducible results; v) pitfalls in test interpretation (that may lead to False Positive or False Negative interpretations); vi) importance of using standard nomenclature, including exercises on variant (mutation) description; vii) regulatory affairs, coding and reimbursement.

The uniqueness of this text is the use of a standardized template for each of the molecular tests being discussed followed by a discussion of relevant quality assurance issues to ensure focused and efficient presentation of information.

Molecular Oncology Testing for Solid Tumors will enable readers to easily understand the Ordering, Processing, Interpretation, Reporting and the clinical Application (OPIRA) process of molecular testing or biomarkers.

Kidney Cancer. Principles and Practice.

Edited by P.N. Lara, E. Jonasch. 2015, pp 402, Eur 155.99, ISBN: 978-3-319-17902-5. Springer International Publishing, Cham, Switzerland.

This is a comprehensive and interdisciplinary textbook that encompasses all clinically relevant aspects of the disease. This new edition has been extensively updated and includes brand new material covering the most recent developments in kidney cancer diagnosis and therapy. The user-friendly and clinically oriented content of the book guarantees that it will be of great interest to a wide range of medical professionals, and every effort has been made to ensure that contributions are both easy to understand and directly related to patient care. Content presentation departs from the usual dense chapter format featuring a lengthy series of paragraphs. Instead, each chapter contains several boxed sections, including one that summarizes essential "take home points" for the busy clinician and another that presents a patient-oriented case highlighting the clinical application of elements discussed in that chapter. In addition, accessible original images, illustrations, and diagrams (some in full color) are used to simplify particularly complex material. This book will be of value for clinicians, researchers, residents, fellows, students, and knowledgeable lay people. The contributors comprise an international group of authors with expertise in kidney cancer epidemiology, molecular biology, pathology, diagnosis, clinical features, staging, prognostic and predictive factors, surgery, systemic therapy, and emerging investigational approaches, among others.

Precision Molecular Pathology of Breast Cancer.

Edited by A. Khan, I.O. Ellis, A.M. Hanby, E.F. Cosar, E.A. Rakha, D. Kandil.

2015, pp 338, Eur 103.99, ISBN: 978-1-4939-2885-9. Springer Science+Business Media, New York, NY, USA.

This volume provides a comprehensive review of the molecular mechanisms involved in precancerous lesions and benign and malignant breast tumors. Given the complex molecular pathways in breast cancer biology, the book simplifies these complex mechanisms and highlights the practical issues important for daily practice. Sections are structured to review breast carcinogenesis and the role of familial predisposition and stem cells in initiation and progression of breast cancer. In-depth chapters present morphologic and molecular correlations in precancerous and malignant breast lesions, while outlining highly practical issues that are in practice today in breast pathology, such as evaluation of estrogen, progesterone receptors, and HER-2.

Written by experts in the field, *Precision Molecular Pathology of Breast Cancer* is a valuable resource that covers the current practice of breast pathology and looks into the future with an emphasis on the molecular basis of breast cancer.

Fundamentals of Clinical Trials. Fifth Edition.

By L.M. Friedman, C.D. Furberg, D. DeMets, D.M. Reboussin, C.B. Granger.

2015, pp 550, Eur 62.39, ISBN: 978-3-319-18538-5. Springer International Publishing, Cham, Switzerland.

This is the fifth edition of a very successful textbook on clinical trials methodology, written by recognized leaders who have long and extensive experience in all areas of clinical trials. The three authors of the first four editions have been joined by two others who add great expertise. Most chapters have been revised considerably from the fourth edition. A chapter on regulatory issues has been included and the chapter on data monitoring has been split into two and expanded. Many contemporary clinical trial examples have been added. There is much new material on adverse events, adherence, issues in analysis, electronic data, data sharing and international trials.

This book is intended for the clinical researcher who is interested in designing a clinical trial and developing a protocol. It is also of value to researchers and practitioners who must critically evaluate the literature of published clinical trials and assess the merits of each trial and the implications for the care and treatment of patients. The authors use numerous examples of published clinical trials to illustrate the fundamentals.

The text is organized sequentially from defining the question to trial closeout. One chapter is devoted to each of the critical areas to aid the clinical trial researcher. These areas include prespecifying the scientific questions to be tested and appropriate outcome measures, determining the organizational structure, estimating an adequate sample size, specifying the randomization procedure, implementing the intervention and visit schedules for participant evaluation, establishing an interim data and safety monitoring plan, detailing the final analysis plan and reporting the trial results according to the pre-specified objectives.

Although a basic introductory statistics course is helpful in maximizing the benefit of this book, a researcher or practitioner with limited statistical background would still find most if not all the chapters understandable and helpful. While the technical material has been kept to a minimum, the statistician may still find the principles and fundamentals presented in this text useful. This book has been successfully used for teaching courses in clinical trial methodology.

Surgical Pathology of Liver Tumors.

Edited by T. Mounajjed, V.S. Chandan, M.S. Torbenson. 2015, pp 477, Eur 155.99, ISBN: 978-3-319-16088-7. Springer International Publishing, Cham, Switzerland.

This text provides a practical guide for the diagnostic surgical pathologist in evaluating tumors involving the liver. It comprehensively covers the histological findings and key clinical and molecular correlates of liver tumors. The focus is on material that is most relevant to the actual practice of liver pathology including those aspects that are directly relevant to the diagnosis, subtyping and prognostication of hepatic adenomas specimens, including biopsy specimens and surgical resections. The book will teach pathologists how to avoid common diagnostic pitfalls. Each chapter uses or discusses the nomenclature and classification system of liver tumors as per the current WHO classification of liver tumors. Each chapter fully incorporates the most up to date diagnostic methodologies, including immunohistochemistry and molecular methods. Referencing is succinct and references were carefully chosen for their key role as the primary sources of information on a given disease. The text is richly illustrated with beautiful color images that highlight not just the "average" histological findings for a given entity, but also fully illustrate all of the key histological variability. Gross images are also included to highlight important diagnostic features. Tables are used judiciously to present summary information that allows a quick review on how similar entities compare and contrast. In addition, the clinical significance of various diseases will be discussed in a focused fashion that highlights how pathology information is being used to make key clinical management decisions. Each chapter is written by experts in hepatopathology, all from the Mayo Clinic Departments of Pathology.

Surgical Pathology of Liver Tumors will be of great utility to surgical pathologists and surgical pathologists in training as well as clinicians involved in the care of patients with liver tumors, particularly hepatologists and oncologists.

Uterine Cancer. Diagnosis and Treatment.

Edited by S. Rajaram, K. Chitrathara, A. Maheshwari. 2015, pp 459, Eur 124.79, ISBN: 978-81-322-1891-3. Springer, New Delhi, India.

Uterine cancers are the commonest malignancies of the female genital tract in the developed world, and are increasing in numbers world over because of obesity and other life-style changes. Many of these malignancies are hereditary and thus, a better understanding of the genetic and molecular biology is needed. This would lead to appropriate treatment plan for improving the quality

of life and long-term survival. This book addresses, in depth, all aspects of uterine malignancies covering both carcinomas and sarcomas. The book is divided into seven sections; the first two sections deal with epidemiology, molecular aspects, familial cancers and pathology and the later sections focus on diagnosis, imaging techniques and comprehensive management of both early stage and advanced cancers. Surgical techniques, adjuvant chemotherapy and radiotherapy have been covered in detail. Apart from the open surgical methods, role of laparoscopy and emerging role of robotic surgery in the contemporary management of endometrial cancers have been discussed. Written by authors with expertise in the field of gynecologic oncology from premier institutes, this book provides up-to-date information on best practice management of uterine malignancies.

Neuroendocrine Tumors. A Multidisciplinary Approach.

Edited by M. Papotti, W.W. de Herder. 2015, pp 270, CHF 202.00, ISBN: 978-3-318-02772-3. S. Karger AG, Basel, Switzerland.

The term 'carcinoid' entered medical literature over 100 years ago to describe a peculiar intestinal epithelial neoplasm. Since then, a large body of literature has expanded the concept of carcinoid, later replaced by the term 'NeuroEndocrine Tumor' (NET), defining a wide spectrum of peculiar tumors, potentially affecting all organs and tissues, originating from neuroendocrine cells, sharing, but, at the same time, keeping, pathognomonic pathological, radiological and clinical features.

This book provides an authoritative overview of the epidemiological, clinical, genetic, molecular and pathological characteristics of NETs and highlights the most relevant controversial issues in the classification, diagnosis and therapy. Furthermore the new frontiers in the field of medical therapies are presented, through a multidisciplinary and translational approach. Considering the fact that NETs have been recently demonstrated less rare as considered so far, "Neuroendocrine Tumors: A Multidisciplinary Approach" is a must read for endocrinologists, gastroenterologists, endocrine surgeons, as well as pathologists, nuclear medicine physicians and radiologists focused on NET.

Immuno-Oncology.

Edited by O. Michielin, G. Coukos. 2015, pp 139, CHF 185.00 ISBN: 978-3-318-05589-4. S. Karger AG, Basel, Switzerland.

Over the last decade, immuno-oncology has witnessed an astonishing pace of discovery and innovation translating into unprecedented successes in the clinical setting, arguably representing one of the most profound and transforming revolution in the history of cancer therapy.

This book provides a concise and accurate outline of the main developments in major tumor types including melanoma, lung, breast, brain and renal cell cancers. In addition, transversal chapters that describe the commonalities of some of the therapeutic strategies are provided to cover topics like immune checkpoint biology, T cell engineering or rational combination therapies. Each chapter has been authored by senior key opinion leaders in their respective fields to provide the most up-to-date view on cancer immuno-oncology. To reflect on the key translational aspect of immuno-oncology, all chapters are making explicit connections between basic science discoveries and the resulting translational therapeutic strategies.

Immuno-Oncology will be an invaluable source of information for scientists interested in the translation of basic immunology into the clinical practice, as well as for clinician interested in deepening their knowledge of current and upcoming immune strategies in the fight against cancers.

Esophageal Cancer. Prevention, Diagnosis and Therapy.

Edited by N.F. Saba, B. El-Rayes. 2015, pp 244, Eur 124.79, ISBN: 978-3-319-20067-5. Springer International Publishing, Cham, Switzerland.

This book reviews the recent progress made in the prevention, diagnosis, and treatment of esophageal cancer. Epidemiology, molecular biology, pathology, staging, and prognosis are first discussed. The radiologic assessment of esophageal cancer and the role of endoscopy in diagnosis, staging, and management are then described. The principles of surgical resection, radiation therapy, and systemic chemotherapy for esophageal cancer are explained, and particular attention is paid to the multidisciplinary management of early-stage cervical, thoracic, distal, and junctional tumors. Up-to-date information is also provided on the treatment of metastatic and recurrent disease and on approaches that may affect future care, such as chemoprevention. Esophageal cancer remains one of the least studied cancers although it accounts for more than 400,000 deaths across the globe each year. The majority of esophageal cancers worldwide are squamous cell carcinomas, yet in the past few decades major epidemiologic changes have occurred affecting the incidence of adenocarcinomas in Western countries. Despite the advances in surgical and non-surgical therapies, overall survival has not changed significantly. It is hoped that Esophageal Cancer: Prevention, Diagnosis and Therapy will assist specialists from a variety of disciplines, including surgery, radiation therapy, gastroenterology, and medical oncology, in delivering optimal, up-to-date care to the benefit of patients.

Plasma Cell Neoplasms. A Morphologic, Cytogenetic and Immunophenotypic Approach.

Edited by M.A. Linden, R.W. McKenna. 2015, pp 152, Eur 103.99, ISBN: 978-3-319-10917-6. Springer International Publishing, Cham, Switzerland.

This textbook will provide a comprehensive, state-of-the art review the field of diagnostic hematopathology as it's applied to patients with plasma cell neoplasms. Particular emphasis will be placed on immunophenotypic data – immunohistochemistry and flow cytometry – as well as cytogenetics. We will also discuss how these ancillary data can predict prognosis and chemotherapeutic response. Plasma Cell Neoplasms will serve as a very useful resource for physicians and researchers interested in the plasma cell myeloma diagnosis, therapy, and research. It will provide a concise yet comprehensive summary of the current status of the field that will help guide patient management and stimulate investigative efforts. All chapters will be written by experts in their fields and will include the most up to date scientific and clinical information.

Bioactive Sphingolipids in Cancer Biology and Therapy.

Edited by Y.A. Hannun, C. Luberto, C. Mao, L.M. Obeid. 2015, pp 490, Eur 155.99, ISBN: 978-3-319-20749-0. Springer International Publishing, Cham, Switzerland.

This volume presents information on both the basic and clinical aspects of sphingolipid-metabolizing enzymes in various cancers. The volume also includes discussions of the innovative techniques and approaches for quantitative analysis and imaging that could significantly impact the general understanding of this topic, and the potential benefit of targeting sphingolipid enzymes to develop novel cancer therapeutics. As well, the volume includes a critical examination of the specific pathways and pathobiologies associated with the altered regulation of sphingolipid metabolism as a contributor to the development and/or maintenance of pathological conditions such as cancer.

Nuclear Receptors: From Structure to the Clinic.

Edited by I.J. McEwan, R. Kumar. 2015, pp 236, Eur 145.59, ISBN: 978-3-319-18728-0. Springer International Publishing, Cham, Switzerland.

This volume focuses on the structural analysis of nuclear receptors from the initial work using isolated protein domains to the more recent exciting developments investigating the conformational shape of full-length receptor complexes. The book also reviews the structure of key nuclear receptor coregulatory proteins. It brings together, for the first time, a comprehensive review of nuclear receptor structure and the importance of receptor conformation underpinning allosteric regulation by different ligands (hormone, drugs, DNA response elements, protein-protein interactions) and receptor activity.

The nuclear receptor superfamily, including receptors for steroid hormones and non-steroid ligands, are pivotal to normal physiology, regulating processes as diverse as reproduction, metabolism, the immune system and brain development. The first members of the family were cloned over 25 years ago, which heralded in the idea of a superfamily of intracellular receptor proteins that bound small molecule ligands: classical steroid hormones, vitamins, fatty acids and other products of

metabolism. These signals are then transmitted through multiprotein receptor-DNA complexes, leading to the regulation of target genes, often in a cell-selective manner. The cloning of the receptor cDNAs also ushered in an era of unparalleled analysis of the mechanisms of action of these ligand-activated transcription factors.

Proteases in Apoptosis: Pathways, Protocols and Translational Advances.

Edited by K. Bose. 2015, pp 245, Eur 124.79, ISBN: 978-3-319-19496-7. Springer International Publishing, Cham, Switzerland.

This book provides a comprehensive overview of the proteases involved in programmed cell death. It presents a focused yet extensive discussion on proteolytic enzymes such as caspases, HtrAs, granzymes, calpains and cathepsins as well as laboratory protocols related to enzymology and apoptosis. Mouse model systems and non-invasive imaging techniques in apoptosis-related diseases such as cancer and neurodegeneration are also covered in this book.

While slowly unravelling the complexities of apoptosis in chapter one, the next three chapters individually elaborate on different classes of proteases that play key roles in the initiation, progression and execution of programmed cell death. The last two chapters complete this discussion by describing different laboratory methodologies and therapeutic advances involving apoptotic proteases. Protocols portraying *in vitro* and *ex vivo* colorimetric and fluorescence-based enzyme kinetic studies as well as cell death assays are explained in the fifth chapter. Preclinical *in vivo* models and non-invasive imaging in apoptosis to understand the complexities of disease progression and their contribution toward therapeutics is recounted in the last chapter.

The book spans topics related to both fundamental and applied biology. It would therefore be equally appealing and informative to scientists working in the field of apoptosis and those who are investigating mechanisms of proteases and enzymes in general. The protocols would certainly benefit both graduate and undergraduate students working in the related fields and provide useful leads for drug design to translational biologists involved in neurodegeneration and cancer research.

Human Embryonic Stem Cell Protocols. Third Edition.

Edited by K. Turksen. 2015, pp 399, Eur 114.39, ISBN: 978-1-4939-2667-1. Springer Science+Business Media, New York, NY, USA.

The potential of human embryonic stem cells to advance not only regenerative medicine applications but also our fundamental understanding of stem cell biology continues to drive interest in research with these cells. This detailed volume collects some of the most interesting and useful protocols that have emerged in the area over the last several years. 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 expert tips on troubleshooting and avoiding known pitfalls.

Thorough and practical, this volume serves as a valuable resource to all those interested in exploring stem cell biology questions in a research setting.

Cyclin-Dependent Kinase (CDK) Inhibitors. Methods and Protocols.

Edited by M. Orzáez, M. Sancho Medina, E. Pérez-Payá. 2015, pp 227, Eur 98.79, ISBN: 978-1-4939-2925-2. Springer Science+Business Media, New York, NY, USA.

This volume contains a collection of relevant information for drug discovery in cell cycle research. Protocols to develop screening assays or to identify novel CDK inhibitors are discussed in the first part of the book. The second part of the book describes elaborate procedures to evaluate activity and mechanism of action of new and already identified CDK inhibitors. The third part of the book talks about protocols to evaluate metabolomics changes associated to inhibitor treatment. Drug delivery strategies focused on nanoparticle development to provide alternative internalization systems for increasing inhibitor efficacy are also described. 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 thorough, this book is a useful tool for scientists interested in this research field.

Immunopharmacogenomics.

Edited by Y. Nakamura. 2015, pp 162, Eur 145.59, ISBN: 978-4-431-55725-8. Springer, Tokyo, Japan.

This book proposes immunogenomics, or immunopharmacogenomics, as the next-generation big science to uncover the role that the immune system plays in the pathogenesis of many diseases, by summarizing the importance of the deep sequencing of T-cell and B-cell receptors. Immunogenomics/ immunopharmacogenomics, a genetic characterization of the immune system made possible by next-generation sequencing (NGS), will be important for the further understanding of the pathogenesis of various disease conditions. Abnormal immune responses in the body lead to development of autoimmune diseases and food allergies. Rejection of recipient cells and tissues, as well as severe immune reactions to donor cells, is also the result of uncontrolled immune responses in the recipient body. There have been many reports indicating that activated immune responses caused by the interaction of drugs and HLA are

present in drug-induced skin hypersensitivity and liver toxicity. The importance of the host immune responses has been recognized in cancer treatments, not only for immunotherapy but also for cytotoxic agents and molecular targeted drugs. Hence, characterization of the T-cell receptor and B-cell receptor repertoire by means of NGS deep sequencing will ultimately make possible the identification of the molecular mechanisms that underlie various diseases and drug responses. In addition, this approach may contribute to the identification of antigens associated with the onset or progression of autoimmune diseases as well as food allergies. Although the germline alterations and somatic mutations have been extensively analyzed, changes or alterations of the immune responses during the course of various disease conditions or during various treatments have not been analyzed. It is also clear that computational analyses to draw meaningful inferences of functional recognition receptors on the immune cells remain a huge challenge.

Microscale Technologies for Cell Engineering.

Edited by A. Singh, A.K. Gaharwar. 2015, pp. 330, Eur 135.19, ISBN: 978-3-319-20725-4. Springer International Publishing, Cham, Switzerland.

This book offers readers cutting-edge research at the interface of polymer science and engineering, biomedical engineering, materials science, and biology. State-of-the-art developments in microscale technologies for cell engineering applications are covered, including technologies relevant to both pluripotent and adult stem cells, the immune system, and somatic cells of the animal and human origin.

This book bridges the gap in the understanding of engineering biology at multiple length scale, including microenvironmental control, bioprocessing, and tissue engineering in the areas of cardiac, cartilage, skeletal, and vascular tissues, among others. This book also discusses unique, emerging areas of micropatterning and three-dimensional printing models of cellular engineering, and contributes to the better understanding of the role of biophysical factors in determining the cell fate. *Microscale Technologies for Cell Engineering* is valuable for bioengineers, biomaterial scientists, tissue engineers, clinicians, immunoengineers, immunologists and stem cell biologists, as it offers a review of the current cutting-edge cell engineering research at multiple length scale and will be valuable in developing new strategies for efficient scale-up and clinical translation.

Stem Cells in Modeling Human Genetic Diseases.

Edited by M. Zatz, O. Keith Okamoto. 2015, pp 147, Eur 145.59, ISBN: 978-3-319-18313-8. Springer International Publishing, Cham, Switzerland.

Using stem cells to investigate currently untreatable human genetic diseases is the focus of this book. Several applications of the Nobel-Prize winning, revolutionary iPS cell technology

are explored in detail, including in schizophrenia, autism, Huntington's disease, Alzheimer's disease, spinocerebellar ataxia, medulloblastoma heterogeneity, progeria, age-related macular degeneration, and muscular dystrophy. The book is divided into seven sections, each composed of authoritative and detailed chapters. The first section provides a theoretical and practical overview of stem cells in disease modeling. The following sections divide stem cell applications into various classes of pathology- psychiatric disorders, neurodegenerative disease, neurogenesis-associated disorders, and laminopathies. Following these sections, the book discusses the future perspectives- and challenges- of iPS technology.

Broad in scope and in audience, this volume is valuable for postgraduate students, scientists, and clinicians interested in applications of the rapidly developing field of stem cell research in disease modeling and drug development and its dynamic role within regenerative medicine.

Hematopoietic Differentiation of Human Pluripotent Stem Cells.

Edited by T. Cheng. 2015, pp 128, Eur 51.99, ISBN: 978-94-017-7311-9.

Springer, Dordrecht, the Netherlands.

This book provides practical methods for differentiating pluripotent stem cells into hematopoietic lineages in the blood system. Pluripotent stem cells have attracted major interest from a fast-growing and multidisciplinary community of researchers who are developing new techniques for the derivation and differentiation of these cells into specific cell lineages. These direct differentiation methods hold great promise for the translational applications of these cells. This book is an essential reference work for researchers at all levels in the fields of hematology and stem cell biology, as well as clinical practitioners in regenerative medicine.