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This book is a printed edition of the Special Issue "Advance of Polymers Applied to Biomedical Applications: Cell Scaffolds" that was published in Polymers

"This book provides an all-embracing review of each and every author's study on the related topics and areas. For instance, some author's study on Chinese Medicine, and some other researchers' survey on biomedical engineering. Moreover, there are also papers that focus on information based bioinformatics, pharmacy and medicinal chemistry and biopharmaceutical technology."--

2015 International Conference on Medicine and Biopharmaceuticals China, 15-16 August 2015

Neural Substrates of Acupuncture: from Peripheral to Central Nervous System Mechanisms

Advance of Polymers Applied to Biomedical Applications: Cell Scaffolds

Functional Genomics

Plant Pathogenic Fungi: Molecular Systematics, Genomics and Evolution

The next healthcare revolution will apply regenerative medicines using human cells and tissues. The aim of the regenerative medicine approach is to create biological therapies or substitutes in vitro for the replacement or restoration of tissue function in vivo lost through failure or disease.

However, whilst science has revealed the potential, and early products have shown the power of such therapies, there is an immediate and long-term need for expertise with the necessary skills to face the engineering and life science challenges before the predicted benefits in human healthcare can be realized. Specifically, there is a need for the development of bioprocess technology for the successful transfer of laboratory-based practice of stem cell and tissue culture to the clinic as therapeutics through the application of engineering principles and practices. This Special Issue of Bioengineering on Stem Cell Bioprocessing and Manufacturing addresses the central role in defining the engineering sciences of cell-based therapies, by bringing together contributions from worldwide experts on stem cell biology and engineering, bioreactor design and bioprocess development, scale-up, and manufacturing of stem cell-based therapies.

Pluripotent stem cells have the potential to revolutionize treatment options for a range of diseases and conditions. This book presents recent advances in our understanding of the biological mechanisms of stem cell self-renewal, reprograming and regeneration. Also covered are novel methodological advances in the culture, purification and use of stem cells, as well as the ethical and moral dilemmas of embryo donation and adoption. These advances will shape the utilization of stem cells for future basic and applied applications.

Emerging Technologies Powering Rare and Neglected Disease Diagnosis and Therapy Development

Cancer Research

Apoptosis and Senescence in Vertebrate Development

Recent Advances in Oral Immunity

Insects at the Center of Interactions with Other Organisms

The oral mucosa is a challenging environment from an immunological perspective, containing discrete niches with a unique architecture and function that requires precise adjustment of the immune system. Being the port of entry to the gastrointestinal and respiratory tracts, the oral cavity is also constantly challenged by antigens derived from air and food. Moreover, the oral cavity is the sole tissue of the body harboring a hard surface (i.e. the tooth) that is exposed to the hostile external environment, resulting in the formation of a complex biofilm that has local and systemic effects. To deal with such challenges, the oral immune system aims to prevent the invasion of pathogens/harmful antigens and to tolerate non-pathogenic counterparts in order to maintain homeostasis. In recent years, numerous studies have addressed these fundamental issues, revealing sophisticated mechanisms engaged by the immune system to maintain oral mucosal homeostasis and to combat various immunological insults. Some of these studies have identified novel immunological mechanisms, emphasizing the uniqueness of the oral immune system and the necessity to further investigate its functions.

The great diversity of land plants (especially angiosperms) is mainly reflected in the diversity of various reproductive organs of plants. However, despite long time intensive investigations, there are still uncertainties and sometimes misunderstandings over the nature and evolution of reproductive organs in land plants. With the new advances made in various fields of botany (especially at molecular level), there is increasing light shed on some aspects of flowers (reproductive organs of angiosperms). In this ebook, we collect 15 papers reporting new understanding on plant reproductive organs. These works range from morphology and anatomy to molecular regulatory networks underlying traditional observations. We understand this single book cannot reach our goal, but we do hope that this book can contribute to or initiate some efforts leading to the final solution of some problems concerning the homology and evolution of reproductive organs in plants.

Journal of the National Cancer Institute

Embryonic Stem Cells

Proceedings of the 2015 International Conference on Medicine and Biopharmaceuticals

Innovative Therapeutic and Immunomodulatory Strategies for Protozoan Infections

Tumor Microenvironment and Resistance to Current Therapies

(A) Figure from "Chami Kim-Jo, Jean-Luc Gatti and Marylene Poirié (2019). *Drosophila Cellular Immunity Against Parasitoid Wasps: A Complex and Time-Dependent Process*. *Front. Physiol.* 10:603. doi: 10.3389/fphys.2019.00603" (B) Figure from "Giuseppe Bari, Andrea Scala, Vita Garzone, Rosanna Salvia, Cem Yalcin, Pasqua Vernile, Antonella Maria Aresta, Osvaldo Facini, Rita Baraldi, Sabino A. Bufo, Heiko Vogel, Enrico de Lillo, Francesca Rapparini and Patrizia Falabella (2019). *Chemical Ecology of Capnodis tenebrionis (L.) (Coleoptera: Buprestidae): Behavioral and Biochemical Strategies for Intraspecific and Host Interactions*. *Front. Physiol.* 10:604. doi: 10.3389/fphys.2019.00604" (C) Figure from "Rosanna Salvia, Annalisa Grimaldi, Rossana Girardella, Carmen Scieuzo, Andrea Scala, Sabino A. Bufo, Heiko Vogel and Patrizia Falabella (2019). *Aphidius ervi Teratocytes Release Enolase and Fatty Acid Binding Protein Through Exosomal Vesicles*. *Front. Physiol.* 10:715. doi: 10.3389/fphys.2019.00715" (D) Figure from "Mariangela Coppola, Gianfranco Diretto, Maria Cristina Digilio, Sheridan Lois Woo, Giovanni Giuliano, Donata Molisso, Francesco Pennacchio, Matteo Lorito and Rosa Rao (2019). *Transcriptome and Metabolome Reprogramming in Tomato Plants by Trichoderma harzianum strain T22 Primes and Enhances Defense Responses Against Aphids*. *Front. Physiol.* 10:745. doi: 10.3389/fphys.2019.00745" (E) Figure from "Rosanna Salvia, Marisa Nardiello, Carmen Scieuzo, Andrea Scala, Sabino A. Bufo, Asha Rao, Heiko Vogel and Patrizia Falabella (2018). *Novel Factors of Viral Origin Inhibit TOR Pathway Gene Expression X*. *Front. Physiol.* 9:1678. doi: 10.3389/fphys.2018.01678" (F) Figure from "Sébastien Cambier, Olivia Ginis, Sébastien J. M. Moreau, Philippe Gayral, Jack Hearn, Graham N. Stone, David Giron, Elisabeth Huguet and Jean-Michel Drezen (2019). *Gall Wasp Transcriptomes Unravel Potential Effectors Involved in Molecular Dialogues With Oak and Rose*. *Front. Physiol.* 10:926. doi: 10.3389/fphys.2019.00926" (G) Figure from "Mariangela Coppola, Gianfranco Diretto, Maria Cristina Digilio, Sheridan Lois Woo, Giovanni Giuliano, Donata Molisso, Francesco Pennacchio, Matteo Lorito and Rosa Rao (2019). *Transcriptome and Metabolome Reprogramming in Tomato Plants by Trichoderma harzianum strain T22 Primes and Enhances Defense Responses Against Aphids*. *Front. Physiol.* 10:745. doi: 10.3389/fphys.2019.00745" (H) Figure from "Zbigniew Adamski, Sabino A. Bufo, Szymon Chowański, Patrizia Falabella, Jan Lubawy, Paweł Marciniak, Joanna Pacholska-Bogalska, Rosanna Salvia, Laura Scrano, Małgorzata Słocińska, Marta Spochacz, Monika Szymczak, Arkadiusz Urbański, Karolina Walkowiak-Nowicka and Grzegorz Rosiński (2019). *Beetles as Model Organisms in Physiological, Biomedical and Environmental Studies – A Review*. *Front. Physiol.* 10:319. doi: 10.3389/fphys.2019.00319" (I) Figure from "Surapathrudu Kanakala, Svetlana Kotsedalov, Galina Lebedev and Murad Ghanim (2019). *Plant-Mediated Silencing of the Whitefly Bemisia tabaci Cyclophilin B and Heat Shock Protein 70 Impairs Insect Development and Virus Transmission*. *Front. Physiol.* 10:557. doi: 10.3389/fphys.2019.00557" (J) Figure from "Rosanna Salvia, Annalisa Grimaldi, Rossana Girardella, Carmen Scieuzo, Andrea Scala, Sabino A. Bufo, Heiko Vogel and Patrizia Falabella (2019). *Aphidius ervi Teratocytes Release Enolase and Fatty Acid Binding Protein Through Exosomal Vesicles*. *Front. Physiol.* 10:715. doi: 10.3389/fphys.2019.00715" (K) Figure from "Lin Quan Ge, Sui Zheng, Hao Tian Gu, Yong Kai Zhou, Ze Zhou, Qi Sheng Song and David Stanley (2019). *Jinggangmycin-Induced UDP-Glycosyltransferase 1-2-Like is a Positive Modulator of Fecundity and Population Growth in Nilaparvata lugens (Stål) (Hemiptera: Delphacidae)*. *Front. Physiol.* 10:747. doi: 10.3389/fphys.2019.00747 " (L) Figure from "Zbigniew Adamski, Sabino A. Bufo, Szymon Chowański, Patrizia Falabella, Jan Lubawy, Paweł Marciniak, Joanna Pacholska-Bogalska, Rosanna Salvia, Laura Scrano, Małgorzata Słocińska, Marta Spochacz, Monika Szymczak, Arkadiusz Urbański, Karolina Walkowiak-Nowicka and Grzegorz Rosiński (2019). *Beetles as Model Organisms in Physiological, Biomedical and Environmental Studies – A Review*. *Front. Physiol.* 10:319. doi: 10.3389/fphys.2019.00319" (M) Figure from "Sébastien Cambier, Olivia Ginis, Sébastien J. M. Moreau, Philippe Gayral, Jack Hearn, Graham N. 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Physiol.* 10:550. doi: 10.3389/fphys.2019.00550" (Q) Figure from "Surapathrudu Kanakala, Svetlana Kotsedalov, Galina Lebedev and Murad Ghanim (2019). *Plant-Mediated Silencing of the Whitefly Bemisia tabaci Cyclophilin B and Heat Shock Protein 70 Impairs Insect Development and Virus Transmission*. *Front. Physiol.* 10:557. doi: 10.3389/fphys.2019.00557" (R) Figure from "Rosanna Salvia, Marisa Nardiello, Carmen Scieuzo, Andrea Scala, Sabino A. Bufo, Asha Rao, Heiko Vogel and Patrizia Falabella (2018). *Novel Factors of Viral Origin Inhibit TOR Pathway Gene Expression X*. *Front. Physiol.* 9:1678. doi: 10.3389/fphys.2018.01678" (S) Figure from "Sébastien Cambier, Olivia Ginis, Sébastien J. M. Moreau, Philippe Gayral, Jack Hearn, Graham N. Stone, David Giron, Elisabeth Huguet and Jean-Michel Drezen (2019). *Gall Wasp Transcriptomes Unravel Potential Effectors Involved in Molecular Dialogues With Oak and Rose*. *Front. Physiol.* 10:926. doi: 10.3389/fphys.2019.00926" (T) Figure from "Gong Chen, Qi Su, Xiaobin Shi, Huipeng Pan, Xiaoguo Jiao and Youjun Zhang (2018). *Persistently Transmitted Viruses Restrict the Transmission of Other Viruses by Affecting Their Vectors*. *Front. Physiol.* 9:1348. doi: 10.3389/fphys.2018.01348" (U) Figure from "Giuseppe Bari, Andrea Scala, Vita Garzone, Rosanna Salvia, Cem Yalcin, Pasqua Vernile, Antonella Maria Aresta, Osvaldo Facini, Rita Baraldi, Sabino A. Bufo, Heiko Vogel, Enrico de Lillo, Francesca Rapparini and Patrizia Falabella (2019). *Chemical Ecology of Capnodis tenebrionis (L.) (Coleoptera: Buprestidae): Behavioral and Biochemical Strategies for Intraspecific and Host Interactions*. *Front. Physiol.* 10:604. doi: 10.3389/fphys.2019.00604" (V) Figure from "Giuseppe Bari, Andrea Scala, Vita Garzone, Rosanna Salvia, Cem Yalcin, Pasqua Vernile, Antonella Maria Aresta, Osvaldo Facini, Rita Baraldi, Sabino A. 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In complex systems, such as our body or a plant, the host is living together with thousands of microbes, which support the entire system in function and health. The stability of a microbiome is influenced by environmental changes, introduction of microbes and microbial communities, or other factors. As learned in the past, microbial diversity is the key and low-diverse microbiomes often mirror out-of-control situations or disease. It is now our task to understand the molecular principles behind the complex interaction of microbes in, on and around us in order to optimize and control the function of the microbial community – by changing the environment or the addition of the right microorganisms. This Research Topic focuses on studies (including e.g. original research, perspectives, mini reviews, and opinion papers) that investigate and discuss: 1) The role of the microbiome for the host/environmental system 2) The exchange and change of microbes and microbial communities (interplay) 3) The influence of external factors toward the stability of a microbiome 4) Methods, possibilities and approaches to change and control a system's microbiome (e.g. in human or plant disease) 5) Experimental systems and approaches in microbiome research. The articles span the areas: human health and disease, animal and plant microbiomes, microbial interplay and control, methodology and the built environment microbiome.

JNCL

Pluripotent Stem Cell Biology

Therapeutic Strategies to Spinal Cord Injury

Severe Eosinophilic Disorders: Mechanisms and Clinical Management

Sperm Differentiation and Spermatozoa Function: Mechanisms, Diagnostics, and Treatment - Volume II

Methods and Model Organisms Editor's Pick 2021Frontiers Media SAEvolution of Reproductive Organs in Land PlantsFrontiers Media SA

Current pharmacotherapies and surgical intervention provide limited benefit in the treatment of neural injuries or halting disease progression and has resulted in significant hope for the successes of stem cell research. The properties of stem cells render them appropriate for cell replacement therapy, endogenous repair, disease modeling as well as high-throughput drug screening and development. Such applications will aid in increasing our knowledge and developing treatments for neurodegenerative disorders such as Parkinson's disease and Huntington's diseases as well as neural traumas including ischemic brain damage and traumatic brain injury. This Frontiers Research topic encouraged contributions from the general field of stem cell biology, with a particular emphasis on utilizing these cells to develop new therapies for neural repair. Related articles deal with issues such as: breakthroughs in stem cell proliferation/differentiation methodologies, using pluripotent and neural stem cells for transplantation and endogenous repair, the use of patient derived stem cells for disease modeling, using stem cells for drug discovery as well as the ethical issues related to the use of stem cells.

Tumor Micro-environment and Drug Resistance

The Role of Neuroinflammation in Chronic Pain Development and Maintenance

Targeted Immunotherapy for Cancer

Immune Regulations in Reproductive Organs and Organ Transplant

Microbiome Interplay and Control

Topic Editor, William Williams, is the president and CEO of BriaCell, which is developing a targeted immunotherapy for breast cancer. This includes raising money to support research and clinical programs and applying for grants. All other Topic Editors declare no competing interests with regards to the Research Topic subject.

Human protozoan infections are an important target for development of new vaccines and drugs. No completely efficacious vaccines for human protozoan infections are available and in the case of malaria resistance to the most efficacious antimalarials has become a global challenge. In ocular toxoplasmosis complete eradication of the bood is not possible, exposing patients to new reactivations. The need of treatment or vaccines for and of less toxic drugs for Leishmania are urgent tasks for protozoologists research community. New research strategies have appeared that enlarged the possibilities for treatment and vaccine development. Reverse vaccinology, bioinformatic search of second use drug candidates and ex vivo analysis have afforded new fields for development.

Mechanisms of Cancer Related Pain and Neuropathy

Brain Cancers: New Perspectives and Therapies

Insights in General Cardiovascular Medicine: 2021

Traditional Chinese Medicine: Organ Vascular Injury - Volume II

This book is a printed edition of the Special Issue "Therapeutic Strategies to Spinal Cord Injury" that was published in IJMS

This book titled "Functional Genomics" contains a selection of chapters focused on crucial topics in functional genomics, from the analysis of the genetic code, to the understanding of the role of the different genes and to the proteomic implications. The book provides an overview on basic issues and some of the recent developments in medicinal science and technology. Covering all the aspects involved in such a broad theme as functional genomics and in all its applications would be impossible within the same book. The different chapters represent a brief introduction to the topic, connecting the most promising developments in functional genomics technologies, focusing on specific applications in biomedicine, agro-food technologies and zootechniques.

Iron Nutrition and Interactions in Plants, 2nd Edition

Insights in Experimental Pharmacology and Drug Discovery: 2021

Linking Neuroinflammation and Glial Phenotypic Changes in Neurological Diseases

The Challenge of New Therapeutic Approaches for Unmet Therapeutic Needs

Stem Cell Bioprocessing and Manufacturing

The ultimate clinical implementation of embryonic stem cells will require methods and protocols to turn these unspecialized cells into the fully functioning cell types found in a wide variety of tissues and organs. In order to achieve this, it is necessary to clearly understand the signals and cues that direct embryonic stem cell differentiation. This book provides a snapshot of current research on the differentiation of embryonic stem cells to a wide variety of cell types, including neural, cardiac, endothelial, osteogenic, and hepatic cells. In addition, induced pluripotent stem cells and other pluripotent stem cell sources are described. The book will serve as a valuable resource for engineers, scientists, and clinicians as well as students in a wide range of disciplines.

Integrative omics of plants in response to stress conditions play more crucial roles in the post-genomic era. High-quality genomic data provide more deeper understanding of how plants to survive under environmental stresses. This book is focused on concluding the recent progress in the Protein and Proteome Atlas in plants under different stresses. It covers various aspects of plant protein ranging from agricultural proteomics, structure and function of proteins, and approaches for protein identification and quantification. A total of 27 papers including two timely reviews have contributed to this Special Issue. In the first part with the topic of "Comparative Proteomics of Different Plants", six papers were included to describe the phenotypic changes and proteomic analyses of different plants under different conditions. Then, another six papers with the topic of "Proteomics of Plants under Osmotic Stress" were included to describe the recent comparative proteomics analyses of plants under osmotic stress, particularly the drought and salinity stresses in leaves of certain plant species. The other proteomics studies on several energy plants and economic crops were reported to demonstrate the recent omics studies on different plants during their development processes. More stress responsive genes and proteins in these plants were identified. These target genes and proteins are important candidates for further functional validation in economic plants and crops.

Developing stem cell-based therapies for neural repair

Cell Biology, Physiology and Molecular Pharmacology of G protein Coupled Receptors

Advances in Mechanisms, Methods and Models

Methods and Model Organisms Editor's Pick 2021

Plant Protein and Proteome Atlas--Integrated Omics Analyses of Plants under Abiotic Stresses