

Bioreactor Systems And Effects Advances In Bioche

Ensheng Dong

Bioreactor Systems and Effects ,1991

Bioreactor Systems and Effects ,2013-11-20

Bioreactor Systems and Effects R. F. Bliem,1991

Bioreactor Systems for Tissue Engineering Cornelia Kasper, Martijn van Griensven, Ralf Pörtner, 2009-03-17 The editors of this special volume would first like to thank all authors for their excellent contributions. We would also like to thank Prof. Dr. Thomas Scheper, Dr. Marion Hertel and Ulrike Kreusel for providing the opportunity to compose this volume and Springer for organizational and technical support. Tissue engineering represents one of the major emerging fields in modern biotechnology; it combines different subjects ranging from biological and material sciences to engineering and clinical disciplines. The aim of tissue engineering is the development of therapeutic approaches to substitute diseased organs or tissues or improve their function. Therefore, three dimensional biocompatible materials are seeded with cells and cultivated in suitable systems to generate functional tissues. Many different aspects play a role in the formation of 3D tissue structures. In the first place the source of the used cells is of the utmost importance. To prevent tissue rejection or immune response, preferentially autologous cells are now used. In particular, stem cells from different sources are gaining exceptional importance as they can be differentiated into different tissues by using special media and supplements. In the field of biomaterials, numerous scaffold materials already exist but new composites are also being developed based on polymeric, natural or xenogenic sources. Moreover, a very important issue in tissue engineering is the formation of tissues under well defined, controlled and reproducible conditions. Therefore, a substantial number of new bioreactors have been developed.

Bioreactors for Tissue Engineering Julian Chaudhuri, Mohamed Al-Rubeai, 2005-10-18 Developments in tissue engineering for human medicine are increasing rapidly. Advances in stem cell biology, biomaterials science and scaffold design underpin this emerging science. An equally important facet of this field is the rational design and operation of bioreactors to control the nascent tissue growth. For the first time in a single volume, the design, characterisation and operation of the bioreactor system in which the tissue is grown is detailed. *Bioreactors for Tissue Engineering* presents an overall picture of the current state of knowledge in the engineering of bioreactors for several tissue types (bone, cartilage, vascular), addresses the issue

of mechanical conditioning of the tissue, and describes the use of techniques such as MRI for monitoring tissue growth. This unique volume is dedicated to the fundamentals and application of bioreactor technology to tissue engineering products. Not only will it appeal to graduate students and experienced researchers in tissue engineering and regenerative medicine, but also to tissue engineers and culture technologists, academic and industrial chemical engineers, biochemical engineers and cell biologists who wish to understand the criteria used to design and develop novel systems for tissue growth in vitro.

Bioreactor Engineering Research and Industrial Applications II Jie Bao, Qin Ye, Jian-Jiang Zhong, 2015-11-26 This book review series presents current trends in modern biotechnology. The aim is to cover all aspects of this interdisciplinary technology where knowledge, methods and expertise are required from chemistry, biochemistry, microbiology, genetics, chemical engineering and computer science. Volumes are organized topically and provide a comprehensive discussion of developments in the respective field over the past 3-5 years. The series also discusses new discoveries and applications. Special volumes are dedicated to selected topics which focus on new biotechnological products and new processes for their synthesis and purification. In general, special volumes are edited by well-known guest editors. The series editor and publisher will however always be pleased to receive suggestions and supplementary information. Manuscripts are accepted in English.

Bioreactor System Design Juan A. Asenjo, 1994-11-17 Describes the state-of-the-art techniques and methods involved in the design, operation, preparation and containment of bioreactor systems, taking into account the interrelated effects of variables associated with both upstream and downstream stages of the design process. The importance of the initial steps in the development of a bioprocess, such as strain and media selection, that have an overwhelming influence on all further operations, is emphasized.; This work is intended for biochemical, chemical and bioprocess engineers; biotechnologists; industrial biochemists; micro- and molecular biologists; food scientists; and upper-level undergraduate and graduate students in these disciplines.

Bioreactor Systems for Tissue Engineering II Cornelia Kasper, Martijn van Griensven, Ralf Pörtner, 2010-10-03
Alternative Sources of Adult Stem Cells: Human Amniotic Membrane, by S. Wolbank, M. van Griensven, R. Grillari-Voglauer, and A. Peterbauer-Scherb; * Mesenchymal Stromal Cells Derived from Human Umbilical Cord Tissues: Primitive Cells with Potential for Clinical and Tissue Engineering Applications, by P. Moretti, T. Hatlapatka, D. Marten, A. Lavrentieva, I. Majore, R. Hass and C. Kasper; * Isolation, Characterization, Differentiation, and Application of Adipose-Derived Stem Cells, by J. W. Kuhnier, B. Weyand, C. Radtke, P. M. Vogt, C. Kasper and K. Reimers; * Induced Pluripotent Stem Cells: Characteristics and Perspectives, by T. Cantz and U. Martin; * Induced Pluripotent Stem Cell Technology in Regenerative Medicine and Biology, by D. Pei, J. Xu, Q. Zhuang, H.-F. Tse and M. A. Esteban; * Production Process for Stem Cell Based Therapeutic Implants: Expansion of the Production Cell Line and Cultivation of Encapsulated Cells, by C. Weber, S. Pohl, R. Poertner, P. Pino-Grace,

D. Freimark, C. Wallrapp, P. Geigle and P. Czermak; * Cartilage Engineering from Mesenchymal Stem Cells, by C. Goepfert, A. Slobodianski, A.F. Schilling, P. Adamietz and R. Poertner; * Outgrowth Endothelial Cells: Sources, Characteristics and Potential Applications in Tissue Engineering and Regenerative Medicine, by S. Fuchs, E. Dohle, M. Kolbe, C. J. Kirkpatrick; * Basic Science and Clinical Application of Stem Cells in Veterinary Medicine, by I. Ribitsch, J. Burk, U. Delling, C. Geißler, C. Gittel, H. Jülke, W. Brehm; * Bone Marrow Stem Cells in Clinical Application: Harnessing Paracrine Roles and Niche Mechanisms, by R. M. El Backly, R. Cancedda; * Clinical Application of Stem Cells in the Cardiovascular System, C. Stamm, K. Klose, Y.-H. Choi

Bioreactor Systems for Tissue Engineering III, 2012

Bioreactor Engineering Research and Industrial Applications I Qin Ye, Jie Bao, Jian-Jiang Zhong, 2018-03-30 This book review series presents current trends in modern biotechnology. The aim is to cover all aspects of this interdisciplinary technology where knowledge, methods and expertise are required from chemistry, biochemistry, microbiology, genetics, chemical engineering and computer science. Volumes are organized topically and provide a comprehensive discussion of developments in the respective field over the past 3-5 years. The series also discusses new discoveries and applications. Special volumes are dedicated to selected topics which focus on new biotechnological products and new processes for their synthesis and purification. In general, special volumes are edited by well-known guest editors. The series editor and publisher will however always be pleased to receive suggestions and supplementary information. Manuscripts are accepted in English.

Current Developments in Biotechnology and Bioengineering Christian Larroche, M. Angeles Sanroman, Guocheng Du, Ashok Pandey, 2016-09-17 Current Developments in Biotechnology and Bioengineering: Bioprocesses, Bioreactors and Controls provides extensive coverage of new developments, state-of-the-art technologies, and potential future trends, reviewing industrial biotechnology and bioengineering practices that facilitate and enhance the transition of processes from lab to plant scale, which is becoming increasingly important as such transitions continue to grow in frequency. Focusing on industrial bioprocesses, bioreactors for bioprocesses, and controls for bioprocesses, this title reviews industrial practice to identify bottlenecks and propose solutions, highlighting that the optimal control of a bioprocess involves not only maximization of product yield, but also taking into account parameters such as quality assurance and environmental aspects. Describes industrial bioprocesses based on the reaction media Lists the type of bioreactors used for a specific bioprocess/application Outlines the principles of control systems in various bioprocesses

Disposable Bioreactors (Advances in Biochemical Engineering/Biotechnology) Fredrick Moreno, 2016-12-29 Over the past five years, the immense financial pressure on the development and manufacturing of biopharmaceuticals has resulted in the increasing use and acceptance of disposables, which are discarded after harvest and therefore intended only for single use. In

fact, such disposables are implemented in all the main bioprocess production stages today and an even higher growth than those in the biopharmaceutical market is predicted (reaching double figures). Alongside disposable filter capsules, membrane chromatography units, tubing, connectors, flexible containers processing or containing fluids, freezer systems, mixers and pumps, and fully controlled disposable bioreactors of up to 2,000 L culture volume are already available on the market.

Bioreactors Carl-Fredrik Mandenius, 2016-02-16 In this expert handbook both the topics and contributors are selected so as to provide an authoritative view of possible applications for this new technology. The result is an up-to-date survey of current challenges and opportunities in the design and operation of bioreactors for high-value products in the biomedical and chemical industries. Combining theory and practice, the authors explain such leading-edge technologies as single-use bioreactors, bioreactor simulators, and soft sensor monitoring, and discuss novel applications, such as stem cell production, process development, and multi-product reactors, using case studies from academia as well as from industry. A final section addresses the latest trends, including culture media design and systems biotechnology, which are expected to have an increasing impact on bioreactor design. With its focus on cutting-edge technologies and discussions of future developments, this handbook will remain an invaluable reference for many years to come.

Engineering 3D Tissue Test Systems Karen J.L. Burg, Didier Dréau, Timothy Burg, 2017-07-28 Engineering 3D Tissue Test Systems provides an introduction to, and unique coverage of, a rapidly evolving area in biomaterials engineering. It reveals the current and future research responses, the current and future diagnostic applications, and provides a comprehensive overview to foster innovation. It offers insight into the importance of 3D systems and their use as benchtop models, spanning applications from basic scientific research to clinical diagnostics. Methods and limitations of building 3D tissue structures are evaluated, with attention given to the cellular, polymeric, and fabrication instrumentation components. The book covers the important aspects of polymeric tissue test systems, highlighting the needs and constraints of the industry, and includes a chapter on regulatory and pricing issues.

Bioreactors Lakhveer Singh, Abu Yousuf, Durga Madhab Mahapatra, 2020-04-22 Bioreactors: Sustainable Design and Industrial Applications in Mitigation of GHG Emissions presents and compares the foundational concepts, state-of-the-art design and fabrication of bioreactors. Solidly based on theoretical fundamentals, the book examines various aspects of the commercially available bioreactors, such as construction and fabrication, design, modeling and simulation, development, operation, maintenance, management and target applications for biofuels production and bio-waste management. Emerging issues in commercial feasibility are explored, constraints and pathways for upscaling, and techno-economic assessment are also covered. This book provides researchers and engineers in the biofuels and waste management sectors a clear, at-a-glance understanding of the actual potential of different advanced bioreactors for their requirements. It is a must-have reference for better-informed decisions when selecting the appropriate technology models for sustainable systems

development and commercialization. Focuses on sustainable bioreactor processes and applications in bioenergy and bio-waste management Explores techno-economic and sustainability assessment aspects through a comparative approach, catering to diverse arrays and applications Offers comprehensive coverage of the most recent technology, from fundamentals to applications

Disposable Bioreactors Regine Eibl,Dieter Eibl,2009-11-27 Over the past five years, the immense financial pressure on the development and manufacturing of biopharmaceuticals has resulted in the increasing use and acceptance of disposables, which are discarded after harvest and therefore intended only for single use. In fact, such disposables are implemented in all the main bioprocess production stages today and an even higher growth than those in the biopharmaceutical market is predicted (reaching double figures). Alongside disposable filter capsules, membrane chromatography units, tubing, connectors, flexible containers processing or containing fluids, freezer systems, mixers and pumps, and fully controlled disposable bioreactors of up to 2,000 L culture volume are already available on the market. Numerous studies highlight the advantages of disposable bioreactors and reveal their potential for simple, safe and fast seed inoculum production, process development and small as well as middle volume production (e.g. bioactive substances, viruses for vaccines and gene therapies etc.). They suggest that such disposable bioreactors (typically characterized by the cultivation chamber or bag from plastic materials) may be advantageous for plant, animal and microbial cells. Running industrial activities such as CFD-modelling, development of single-use process monitoring and control technology, and standardized film formulations are attempting to resolve the limitations of the current disposable bioreactors. These achievements, along with substantial improvements in product yield, will reduce the use of stainless steel in the biomanufacturing facilities of the future.

Multiphase Bioreactor Design Joaquim M.S. Cabral,Manuel Mota,Johannes Tramper,2001-09-20 Bioreaction engineering is fundamental to the optimization of biotechnological processes and the production of biochemicals by enzymes, microbial, plant and animal cells and higher organisms. A reference text for postgraduate students and researchers in biochemical engineering and bioreactor design, *Multiphase Bioreactor Design* describes the

Recent Advances in Bioprocess Engineering and Bioreactor Design Swasti Dhagat,

Recent Progress of Biochemical and Biomedical Engineering in Japan I Takeshi Kobayashi,2004-07-21 The areas we deal with in biochemical engineering have expanded to include many various organisms and humans. This book has gathered together the information of these expanded areas in biochemical engineering in Japan. These two volumes are composed of 15 chapters on microbial cultivation techniques, metabolic engineering, recombinant protein production by transgenic avian cells to biomedical engineering including tissue engineering and cancer therapy. Hopefully, these volumes will give readers a glimpse of the past and also a view of what may happen in biochemical engineering in Japan.

Production of Biomass and Bioactive Compounds Using Bioreactor Technology Kee-Yoeup Paek,Hosakatte Niranjana

Murthy,Jian-Jiang Zhong,2014-09-30 The bioactive compounds of plants have world-wide applications in pharmaceutical, nutraceutical and food industry with a huge market. In this book, a group of active researchers have addressed on the most recent advances in plant cell and organ cultures for the production of biomass and bioactive compounds using bioreactors. Tremendous efforts have been made to commercialize the production of plant metabolites by employing plant cell and organ cultures in bioreactors. This book emphasizes on the fundamental topics like designing of bioreactors for plant cell and organ cultures, various types of bioreactors including stirred tank, airlift, photo-bioreactor, disposable bioreactor used for plant cell and organ cultures and the advantages and disadvantages of bioreactor cultures. Various strategies for biomass production and metabolite accumulation have been discussed in different plant systems including Korean/Chinese ginseng, Siberian ginseng, Indian ginseng, Echinacea, St. John's wort, Noni, Chinese licorice, Caterpillar fungus and microalgae. Researches on the industrial application of plant cells and organs with future prospects as well as the biosafety of biomass produced in bioreactors are also described. The topics covered in this book, such as plant cell and organ cultures, hairy roots, bioreactors, bioprocess techniques, will be a valuable reference for plant biotechnologists, plant biologists, pharmacologists, pharmacists, food technologists, nutritionists, research investigators of healthcare industry, academia, faculty and students of biology and biomedical sciences. The multiple examples of large-scale applications of cell and organ cultures will be useful and significant to industrial transformation and real commercialization.

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