1. Record Nr. UNINA9910828772903321

Titolo	Micro and nanoengineering of the cell microenvironment : technologies and applications / / Ali Khademhosseini ... [et al.]
Pubbl/distr/stampa	Boston ; ; London, : Artech House, c2008
ISBN	1-59693-149-3
Edizione	[1st ed.]
Descrizione fisica	1 online resource (646 p.)
Collana	Artech House engineering in medicine & biology series
Altri autori (Persone)	KhademhosseiniAli
Disciplina	571.6 610.28
Soggetti	Biomedical engineering Cells - Microbiology Ultrastructure (Biology)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Micro and Nanoengineering of the Cell Microenvironment: Technologies and Applications; Contents; Foreword; Chapter 1 Micro- and Nanoengineering the Cellular Microenvironment; 1.1 Introduction; 1.2 Cellular Microenvironment; 1.3 Controlling Cellular Behavior; 1.4 Micro- and Nanoengineering the Cellular Microenvironment; 1.5 Book Structure; References; Chapter 2 Gradient-Generating Microfluidic Devices for Cell Biology Research; 2.1 Introduction; 2.2 Conventional Devices for Soluble Gradient Generation; 2.3 Microfluidic-Based Devices for Gradient Generation. 2.4 Biological Applications of Gradient-Generating Microfluidic Devices2.5 Summary and Future Directions; References; Chapter 3 Surface Patterning for Controlling Cell-Substrate Interactions; 3.1 Introduction; 3.2 Self-Assembled Monolayers, Lithography, and Other Important Tools; 3.3 Controlling the Adsorption of Proteins on Surface; 3.4 Patterning of Proteins and Cells; 3.5 Dynamic Patterning of Cells; 3.6 Other Systems for Patterning Cells; 3.7 Conclusion; References; Chapter 4 Patterned Cocultures for Controlling Cell-Cell Interactions; 4.1 Introduction; 4.2 Random Coculture Systems. 4.3 Patterned Coculture Systems4.4 Conclusion; References; Chapter 5 Micro- and Nanofabricated Scaffolds for Three-Dimensional Tissue Recapitulation; 5.1 Introduction; 5.2 Microfabricated Interfaces; 5.3

Nanofabricated Interfaces; 5.4 Conclusion; References; Chapter 6 Biomimetic Hydrogels to Support and Guide Tissue Formation; 6.1 Introduction; 6.2 Hydrogels and Their Synthesis; 6.3 Incorporating Bioactive Factors into Hydrogels; 6.4 Two-Dimensional Patterning of Hydrogels; 6.5 Three-Dimensional Rapid Prototyping of Hydrogels; 6.6 Summary; References.
Chapter 7 Three-Dimensional Cell-Printing Technologies for Tissue Engineering7.1 Overview; 7.2 Development of Cell-Printing Technologies; 7.3 Conventional Three-Dimensional Cell-Printing Methods; 7.4 Current Applications of Cell-Printing Technology: Organ Printing; 7.5 Other Applications of Cell Printing; 7.6 Technologies for Three-Dimensional Cell Printing: Single Cell Epitaxy by Acoustic Picoliter Droplets; 7.7 Conclusion; References; Chapter 8 Using Microfabrication to Engineer Cellular and Multicellular Architecture; 8.1 Introduction; 8.2 Patterning Adhesion; 8.3 Patterning Single Cells.
8.4 Multicellular Patterning8.5 Engineering Single Cell-Cell Interactions; 8.6 Cell Patterning by Active Positioning: Dielectrophoresis and Microfluidics; 8.7 Three-Dimensional Patterning; 8.8 Future Directions; References; Chapter 9 Technologies and Applications for Engineering Substrate Mechanics to Regulate Cell Response; 9.1 Introduction; 9.2 How Cells Sense the Stiffness of Their Substrate; 9.3 Technologies to Engineer the Mechanical Properties of the Substrate; 9.4 Effects of Substrate Mechanics on Cell Response; 9.5 Summary and Future Challenges; References.

Sommario/riassunto

Supported with 140 illustrations, the volume exhaustively covers the micro- and nano-system technologies involved in developing cell-based bioengineering applications. You get full details on efforts to engineer the soluble and insoluble cell microenvironments, including the latest advances in microfluidic devices, surface patterning, 3D scaffolds, and techniques for engineering cellular mechanical properties and topography.