1. Record Nr. UNINA9910298458003321

Titolo	Bioprinting in Regenerative Medicine / / edited by Kursad Turksen
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-21386-5
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (148 p.)
Collana	Stem Cell Biology and Regenerative Medicine, , 2196-8985
Disciplina	571.889
Soggetti	Regenerative medicine Tissue engineering Stem cells Biomedical engineering Regenerative Medicine/Tissue Engineering Stem Cells Biomedical Engineering and Bioengineering
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 at the end of each chapters and index.
Nota di contenuto	Preface; Contents; Contributors; About the Editor; Bioinks for Bioprinting; 1 Introduction; 1.1 Elements of 3D Bioprinting; 1.2 Bioinks-Gels and Solutions; 1.3 Materials Used as Bioinks in Bioprinting; 1.4 Additives to Bioinks to Influence Cellular Behavior; 1.5 Cells for Bioprinting; 1.6 Chemical and Photosensitive Cross Linking of Solutions and Gels; 1.7 Summary; References; 3D Bioprinting and 3D Imaging for Stem Cell Engineering; 1 Introduction; 2 Three-Dimensional Bio-Printing Techniques; 2.1 Inkjet-Based Printing; 2.2 Extrusion-Based Printing; 2.3 Laser Direct-Write 3 Bio-Printing for Stem Cell Engineering3.1 Stem Cell Niche; 3.2 Bioprinting Applications to Influence Stem Cell Signaling and Differentiation; 4 3D Imaging Techniques for Cell and Tissue Engineering Applications; 4.1 Biomedical Imaging Modalities; 4.2 Optical Imaging Techniques; 4.3 Conclusion; 5 Integration of Macro- and Micro-Printing, and Optical Imaging for Stem Cell and Tissue Engineering Applications; 5.1 Integration of Macro- and Micro-Printing;

5.2 Integration of Bioprinting and Optical Imaging; References; Bioprinting with Live Cells; 1 Introduction; 2 Bioprinting with Live Cells 2.1 2D Patterning and Cell-Sheet Technology2.2 Inkjet-Based Bioprinting; 2.3 Self-Assembly Based Bioprinting; 2.4 Extrusion-Based Bioprinting; 3 Conclusion and Discussion on Stem Cell Printing; References; Hydrogels for Cell Encapsulation and Bioprinting; 1 Introduction; 2 Hydrogels as Bio-Ink; 3 Hydrogels as Bio-Paper; 4 Properties of Bioprinting Hydrogels; 4.1 Viscosity; 4.2 Gelation Time; 4.3 Water Content and Swelling; 4.4 Degradation; 4.5 Mechanical Properties; 5 Conclusions; References; Three-Dimensional Bioprinting in Regenerative Medicine; 1 Introduction; 2 Cell Printing
3 Microvasculature Printing4 Muscle Printing; 5 Cartilage Printing; 6 Bone Printing; 7 The Future; References; Bioprinting of Dynamic Human Organs-on-Chips: Enabling Technologies for Rapid Drug Development and Personalized Medicine; 1 Clinical Need for Organs-on-Chips; 1.1 History of Drug Discovery and Development; 1.2 Tissue Culture Bioassays; 1.3 Animal Models; 1.4 Advent of Organs-on-Chips; 1.5 Current Challenges; 2 Bioprinting Design and Fabrication; 2.1 Design; 2.2 Fabrication; 3 Regulatory Pathway and Future Directions; 3.1 Regulatory Pathway
3.2 Future Directions and Concluding ThoughtsReferences; Index

Sommario/riassunto

This volume explores laser-assisted bioprinting, focusing on the most recent developments in its use for tissue engineering. Bringing together authoritative and international perspectives, the text begins with an overview and goes on to cover bioprinting in cell viability and pattern viability, tissue microfabrication to study cell proliferation, microenvironment for controlling stem cell fate, cell differentiation, zigzag cellular tubes, cartilage tissue engineering, osteogenesis, vessel substitutes, skin tissue and much more. Bioprinting is on its way to becoming a dominant technology in tissue-engineering; Bioprinting in Regenerative Medicine, from the bestselling Stem Cell Biology in Regenerative Medicine series, is essential reading for those researching or working in regenerative medicine, tissue engineering, or translational research. Those studying or working with stem cells who are interested in the development of the field will also find the information invaluable.