. Record Nr.	UNINA9910787213403321
Titolo	Nanotechnology applications for tissue engineering / / edited by Sabu Thomas, Yves Grohens, Neethu Ninan
Pubbl/distr/stampa	Oxford, England ; ; Waltham, Massachusetts : , : William Andrew, , 2015 ©2015
ISBN	0-323-35303-7
Descrizione fisica	1 online resource (336 p.)
Collana	Micro & Nano Technologies Series
Disciplina	610.28
Soggetti	Tissue engineering Nanotechnology
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	Front Cover; Nanotechnology Applications for Tissue Engineering; Copyright Page; Contents; List of Contributors; About the Editors; Preface; 1 Nanomedicine and Tissue Engineering; 1.1 Introduction; 1.1.1 Nanomedicine; 1.1.2 Tissue Engineering; 1.2 Relationship of Nanomedicine and Tissue Engineering; 1.2.1 Nanomedicine Approaches in Bone Tissue Engineering; 1.2.2 Nanomedicine Approaches in Cardiac Tissue Engineering; 1.2.3 Nanomedicine Approaches in Skin Tissue Engineering; 1.2.4 Nanomedicine Approaches in Skin Tissue Engineering 1.2.5 Nanomedicine Approaches for Other Tissue Engineering Disciplines1.3 Nanodrug Delivery Systems for Tissue Regeneration; 1.3.1 Nanotheranostics; 1.3.2 Nanoregeneration Medicine; 1.3.3 Nanodrug Delivery; 1.3.3.1 Dendrimers; 1.3.3.2 Liposomes; 1.3.3.3 Carbon Nanotubes; 1.3.3.4 Nanocomposite Hydrogel; 1.4 Medical Applications of Molecular Nanotechnology; 1.4.1 Nanorobots; 1.4.2 Cell Repair Machines; 1.5 Summary and Future Directions; References; 2 Biomaterials: Design, Development and Biomedical Applications; 2.1 Overview; 2.2 Design of Biomaterials; 2.2.1 Polymers; 2.2.2 Metals 2.2.3 Composite Materials2.2.4 Ceramics; 2.3 Basic Considerations to Design Biomaterial; 2.4 Characteristics of Biomaterials; 2.4.1 Nontoxicity; 2.4.2 Biocompatible; 2.4.3 Absence of Foreign Body

1.

	Reaction; 2.4.4 Mechanical Properties and Performance; 2.5 Fundamental Aspects of Tissue Responses to Biomaterials; 2.5.1 Injury; 2.5.2 Blood-Material Interactions and Initiation of the Inflammatory Response; 2.5.3 Provisional Matrix Formation; 2.5.4 Acute Inflammation; 2.5.5 Chronic Inflammation; 2.5.6 Granulation Tissue; 2.5.7 Foreign Body Reaction; 2.5.8 Fibrosis and Fibrous Encapsulation 2.6 Evaluation of Biomaterial Behavior2.6.1 Assessment of Physical Properties; 2.6.2 In vitro Assessment; 2.6.3 In vivo Assessment; 2.7 Properties of Biomaterials Assessed Through In Vivo Experiments; 2.7.1 Sensitization, Irritation, and Intracutaneous Reactivity; 2.7.2 Systemic, Subacute, and Subchronic Toxicity; 2.7.3 Genotoxicity; 2.7.4 Implantation; 2.7.5 Hemocompatibility; 2.7.6 Chronic Toxicity; 2.7.9 Biodegradation; 2.7.10 Immune Responses; 2.8 Applications of Biomaterials; 2.8.1 Orthopedic Applications 2.8.2 Ophthalmologic Applications2.8.3 Cardiovascular Applications; 2.8.4 Dental Applications; 2.8.5 Wound Dressing Applications; 2.8.6 Other Applications; 2.9 Future Directions in Biomaterials; 2.10 Conclusions; Acknowledgments; References; 3 Electrospinning of Polymers for Tissue Engineering; 3.1 Introduction; 3.2 History of Electrospinning; 3.3 Experimental Setup and Basic Principle; 3.3.1 Theoretical Background; 3.4 Effects of Parameters on Electrospinning; 3.4.1 Solution Parameters; 3.4.2 Concentration and Viscosity; 3.4.3 Molecular Weight; 3.4.4 Surface Tension 3.4.5 Conductivity of the Solution
Sommario/riassunto	Tissue engineering involves seeding of cells on bio-mimicked scaffolds providing adhesive surfaces. Researchers though face a range of problems in generating tissue which can be circumvented by employing nanotechnology. It provides substrates for cell adhesion and proliferation and agents for cell growth and can be used to create nanostructures and nanoparticles to aid the engineering of different types of tissue. Written by renowned scientists from academia and industry, this book covers the recent developments, trends and innovations in the application of nanotechnologies in tissue engineer