

1. Record Nr.	UNINA9910495246303321
Titolo	Advances in nanomaterials-based cell biology research / / Yunfeng Lin, Ronghui Zhou, editors
Pubbl/distr/stampa	Singapore : , : Springer, , [2021] ©2021
ISBN	981-16-2666-9
Descrizione fisica	1 online resource (227 pages)
Disciplina	610.284
Soggetti	Nanostructured materials - Health aspects Nanomedicine Stem cells Cèl·lules mare Materials nanoestructurats Nanomedicina Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Contents -- About the Authors -- Chapter 1: Nanomaterials and Stem Cells for Bone Tissue Engineering -- 1.1 Introduction -- 1.2 Stem Cell Types Applied to Nanomaterial-Based Bone Regeneration -- 1.2.1 Mesenchymal Stem Cells (MSCs) -- 1.2.1.1 Bone Marrow Stromal Cells (BMSCs) -- 1.2.1.2 Adipose-Derived Stem Cells (ASCs) -- 1.2.1.3 Dental Pulp Stem Cells (DPSCs) -- 1.2.2 Other Types of Adult Stem Cells -- 1.3 Nanomaterials Applied to Stem Cell Osteogenic Differentiation -- 1.3.1 Polymeric Nanomaterials -- 1.3.2 Metal-Based Nanomaterials -- 1.3.3 Silica-Based Nanomaterials -- 1.3.4 Carbon-Based Nanomaterials -- 1.3.5 Nucleic Acid-Based Nanomaterials -- 1.3.6 Hydroxyapatite -- 1.4 Properties of Nanomaterials Affecting Osteogenic Differentiation and Bone Formation -- 1.4.1 Mechanical Properties -- 1.4.2 Porosity -- 1.4.3 Hydrophilicity -- 1.4.4 Biodegradability -- 1.4.5 Biocompatibility -- 1.5 Nanostructures and Scaffolds Applied to Bone Tissue Engineering -- 1.5.1 Nanopatterns -- 1.5.2 Microspheres/Nanospheres -- 1.5.3 Nanotubes -- 1.5.4

Nanofibers -- 1.5.5 Nanocomposites -- 1.6 Growth Factors and Molecular Pathways Involved in Osteogenic Differentiation and Bone Tissue Engineering -- 1.6.1 Bone Morphogenetic Protein (BMP) -- 1.6.2 Vascular Endothelial Growth Factor (VEGF) -- 1.6.3 Basic Fibroblast Growth Factor (bFGF) -- 1.6.4 Insulin-like Growth Factor-1 (IGF-1) -- 1.6.5 Other Growth Factors Related to Bone Regeneration -- References -- Chapter 2: The Application of Nanomaterial in Skeletal Muscle Regeneration -- 2.1 Introduction -- 2.2 The Research Progress of Nanoscaffold Materials in Skeletal Muscle Regeneration -- 2.2.1 The Research Progress of Nanofiber Scaffold in Skeletal Muscle Regeneration -- 2.2.1.1 Electrospinning Research Progress in Preparation of Nanofibers.

2.2.1.2 The Research Progress of Physical Cues of Nanofibers on Myogenesis -- 2.2.1.3 Biochemical Cues of Nanofibers on Myogenesis -- 2.2.1.4 The Research Progress of Electrical Conductivity of Nanofibers on Myogenesis -- 2.2.1.5 The Research Progress of PCL Scaffolds for Muscle Regeneration -- 2.2.1.6 Other Nanofiber Scaffold Research Progress for Muscle Regeneration -- 2.2.2 The Research Progress of Nanohydrogels in Skeletal Muscle Regeneration -- 2.2.3 The Research Progress of Nanofilm in Skeletal Muscle Regeneration -- 2.2.4 The Research Progress of Nanocomposite Materials in Skeletal Muscle Regeneration -- 2.2.5 Other Nanomaterial Research Progress in Skeletal Muscle Regeneration -- 2.3 The Research Progress of Nanoparticles in Skeletal Muscle Regeneration -- 2.3.1 The Research Progress of Au Nanoparticles in Myogenesis -- 2.3.2 The Research Progress of Nanotubes and Nanorods in Myogenesis -- 2.3.3 The Research Progress of Other Nanoparticles in Myogenesis -- 2.3.4 The Research Progress of Composite Nanoparticles in Myogenesis -- 2.4 Conclusion -- References -- Chapter 3: Application of Nanomaterials in Neurodegenerative Diseases -- 3.1 Introduction -- 3.2 BBB -- 3.3 Nanomaterials -- 3.3.1 Size -- 3.3.2 Shape -- 3.3.3 Charge -- 3.3.4 Delivery Methods -- 3.4 NDD -- 3.4.1 AD -- 3.4.2 PD -- 3.4.3 HD -- 3.4.4 Other -- 3.5 Conclusion -- References -- Chapter 4: Application of Nano Drug Delivery Systems in Inhibition of Tumors and Cancer Stem Cells -- 4.1 Introduction -- 4.2 Cancer Stem Cell -- 4.2.1 Cell Cycle Arrest -- 4.2.2 Drug Efflux -- 4.2.3 DNA Damage Tolerance and DNA Damage Repair -- 4.2.4 Epithelial Mesenchymal Transformation (EMT) -- 4.2.5 Tumor Microenvironment -- 4.3 Nano Drug Delivery Systems -- 4.3.1 Strengthen Drug Stability -- 4.3.2 Enhance Drug Targeting -- 4.3.3 Better Degradability -- 4.3.4 Increase Bioavailability of Drugs.

4.4 Liposomes -- 4.4.1 Overcoming the Quick Elimination by MPS -- 4.4.2 Constructing Active Targeting Liposomes -- 4.4.3 Realizing Triggered Release of Drug -- 4.4.4 Constructing Multifunctional Liposomes -- 4.5 Polymeric Micelles -- 4.5.1 Passive Targeting and Active Targeting Polymeric Micelles -- 4.5.2 Drug Co-delivery Systems -- 4.5.3 Environmentally Responsive Polymeric Micelles -- 4.6 Conclusion -- References -- Chapter 5: The Application and Problems of Tetrahedral Framework Nucleic Acids as a Drug Carrier in Biomedicine Fields -- 5.1 Introduction -- 5.2 DNA Nanostructures -- 5.2.1 The Concept of DNA Nanostructures -- 5.2.2 The Development of DNA Nanostructures -- 5.3 Tetrahedral Framework Nucleic Acids -- 5.3.1 Self-assembly -- 5.3.2 The Physical, Chemical, and Biological Characteristics -- 5.3.2.1 The Nanoscale and Editable -- 5.3.2.2 The Ability to Enter Cells -- 5.3.2.3 Biocompatibility and Biodegradability -- 5.3.2.4 High Chemical Reactivity and Multiple Modification Sites -- 5.3.3 The Application of tFNAs as a Drug Carrier in Biomedicine Fields -- 5.3.3.1 Transport Small-Molecule Drugs for Cancer Therapy --

5.3.3.2 Transport Functional Nucleic Acids -- Antisense Oligodeoxynucleotide -- Antisense Peptide Nucleic Acid -- Aptamer -- siRNA -- Num, Dpt. -- 5.3.3.3 Transport Peptides and Proteins -- 5.3.3.4 Transport Multiple Drug Molecules -- 5.3.4 The Current Problems of tFNAs as a Drug Carrier in Biomedicine Fields We Faced -- 5.3.4.1 Improves the Stability of DNA Tetrahedron In Vivo -- 5.3.4.2 Improves the Cell Uptake Efficiency of DNA Tetrahedron -- 5.3.4.3 Improve the Synthetic Yield and Reduce the Synthesis Cost of DNA Tetrahedron -- 5.4 Conclusion -- References -- Chapter 6: Research Progress on Antibacterial Application with Nucleic Acid and Nucleic Acid Materials -- 6.1 Introduction -- 6.2 Nucleic Acid Aptamer. 6.3 Antisense Oligonucleotide (ASODN) and Antisense Peptide Nucleic Acid (PNA) -- 6.4 Combined Application of DNA Nanomaterials and Antisense Technology -- 6.5 Combination of DNA Nanostructures and Antibiotics -- 6.6 Combined Application of DNA Nanostructure and Metal Nanoparticles -- 6.7 Combined Application of DNA Nanostructure and Antimicrobial Peptide (AMP) -- 6.8 Antimicrobial Studies of Some Other Nucleic Acid or Analogues -- 6.9 Conclusion -- References -- Chapter 7: The Application of DNA Nanostructures in Vaccine Technology -- 7.1 Introduction -- 7.2 DNA Nanostructures -- 7.2.1 DNA Tetrahedron -- 7.2.2 DNA Nanotubes -- 7.2.3 DNA Hydrogel -- 7.2.4 DNA Nanoflower -- 7.2.5 DNA Dendrimer -- 7.3 Challenge and Prospect -- References.

---