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Nota di contenuto	Chapter 1. Introduction to Cartilage Tissue; Development, Structure and Functions -- Chapter 2. Cartilage defects and diseases: conventional therapies and its limitations -- Chapter 3. Strategies to Control Mesenchymal Stem Cell Differentiation for Regenerating Phenotypically Defined Articular Cartilage -- Chapter 4. Single Cell Analysis Approaches in Diagnostic and Therapeutic -- Chapter 5. The Importance of Mechanical Stimulation in Cartilage Formation: Applications of Bioreactors -- Chapter 6. Signaling Pathways Regulating Cartilage Formation -- Chapter 7. Role and Application of Biomolecules for Regeneration of Cartilage Tissue -- Chapter 8. Extracellular Matrix Mimicry for Cartilage Tissue Formation -- Chapter 9. Cartilage Tissue Engineering; Advances and Frontiers -- Chapter 10. Advances in Hydrogels for Cartilage Regeneration -- Chapter 11. Shape Memory Polymers in Cartilage Tissue Engineering -- Chapter 12. Widely-used Biomaterials in Cartilage Biofabrication -- Chapter 13. Importance of 3D Printing Techniques in Cartilage Tissue Engineering -- Chapter 14. Cell Therapy as a Novel Therapeutic Approach for Cartilage Diseases -- Chapter 15. Extracellular Vesicles: A Potent Therapeutic Tool for

Cartilage Regeneration -- Chapter 16. Osteochondral unit Approach for Articular Cartilage Regeneration -- Chapter 17. Stem Cells Therapy for Cartilage Regeneration in Clinic; Challenges and Opportunities -- Chapter 18. Validation of Tissue-Engineered Constructs: Preclinical and Clinical Studies.

Sommario/riassunto

This book provides a comprehensive overview of cartilage structure, functions, and approaches for the regeneration of cartilage tissue. It reviews multiple signaling pathways that are involved in the growth and repair of cartilage tissue. The initial chapter of the book examines the etiology, diagnosis, and pathological features of various cartilage diseases. Subsequently, the book presents recent advances in biomaterial sciences, regenerative medicine, and fabrication technology for cartilage regeneration. It discusses hydrogels as a promising scaffold for cartilage tissue engineering, focusing on recapitulating microenvironments present during development or in adult tissue to induce the formation of cartilaginous constructs with biochemical and mechanical properties of native tissue. Lastly, it covers the applications of 3 D printing techniques for the fabrication of scaffolds for cartilage tissue regeneration for the production of biological implants capable of treating a range of conditions.
