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Nota di contenuto	Chapter 1: Tissue Engineering -- Chapter 2: Types of Scaffolds -- Chapter 3: 3D Printing Techniques -- Chapter 4: Properties and Preparation Techniques of Hydrogels -- Chapter 5: Natural Hydrogels and Bioinks -- Chapter 6: Synthetic Hydrogels and Bioinks -- Chapter 7: Hydrogels Similar to Extracellular Matrix -- Chapter 8: Smart Hydrogels and Applications -- Chapter 9: Injectable Hydrogels and Bioinks -- Chapter 10: Conductive Hydrogels and Bioinks -- Chapter 11: Hydrogels Used in Controlled Delivery Systems -- Chapter 12: Hydrogels Used in Nerve Therapy -- Chapter 13: Hydrogels Used in Cartilage Treatment -- Chapter 14: Hydrogels Used in Bone Treatment -- Chapter 15: Hydrogels Used in Skin Therapy -- Chapter 16: Hydrogels Used for the Treatment of Cornea -- Chapter 17: Hydrogels Used in Contact Lenses and Intraocular Lenses -- Chapter 18: Regulatory Guidelines for Hydrogels and Bioinks in Clinical Trials.

Sommario/riassunto

This book offers an in-depth exploration of both natural and synthetic polymeric hydrogels and bioinks, with a focus on their groundbreaking use in medical applications, particularly in the production of 3D tissue constructs and organ models. It covers the science and applications of hydrogels, beginning with a foundational understanding of tissue engineering and scaffold types. It describes the versatile 3D printing techniques that bring bioinks to life, followed by in-depth analyses of natural and synthetic hydrogels. Special emphasis is placed on hydrogels that mimic the extracellular matrix, providing crucial insights for researchers working to create realistic tissue environments. From smart hydrogels with adaptive properties to injectable solutions and conductive formulations, this book highlights innovations that are transforming therapeutic strategies. The text also covers a range of biomedical applications, including hydrogels in controlled delivery systems, nerve, cartilage, bone, skin, and cornea therapies, and their use in producing contact and intraocular lenses. Meticulously curated by leading experts in the field, this volume bridges the gap between cutting-edge research and practical applications, making it an essential guide for advancing tissue engineering and regenerative medicine.