Preface

This special edition presents results of recent advances in biomaterials and biomedical engineering, highlighting solutions for biomedicine, healthcare and medical training. The articles address the design and performance of bioactive phosphate glasses, titanium-based biomedical systems and shape-memory alloys such as Nitinol, and biocompatible piezoelectric materials, with an emphasis on their antibacterial properties, biocompatibility, osteoconductivity, and tribocorrosion resistance. Emerging technologies—including biomaterial 3D printing, hydrogel extrusion, optically guided cell patterning, biosensoring, and materials informatics—are presented alongside surface engineering approaches such as adherent diamond-like carbon coatings. Applications span orthopaedic and dental implants, acetabular cups, bone–implant interfaces and advanced medical training tools, including brain phantoms.

The edition provides a comprehensive overview of novel materials and engineering innovations that ensure the development of next-generation biomedicine.