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Sommario/riassunto	Biomaterials—the materials used for the manufacturing of medical devices— are part of everyday life. Each one of us has likely had the experience of visting a dentist’s office, where a number of biomaterials are used temporarily or permanently in the mouth. Devices that are more complex are used for to support, heal, or replace living tissues or organs in the body that are suffering or compromised by different conditions. The materials used in their construction are metals and metallic alloys, polymers—ranging from elastomers to adhesives—and ceramics.Within these three cases, there are materials that are inert in the living environment, that perform an active function, or that are dissolved and resorbed by the metabolic pathways. Biomaterials are the outcome of a dynamic field of research that is driven by a growing demand and by the competition among the manufacturers of medical devices, with innovations improving the performance of existing devices and that contribute to the development of new ones. The collection of papers forming this volume have one particular class of of biomaterial in common, ceramic (bioceramic) composites, which as so far been used in applications such as orthopaedic joint replacement as well as in dental implants and restorations and that is being intensively investigated for bone regeneration applications. Today’s bioceramic composites (alumina–zirconia) are the golden standard in joint replacements. Several manufracturers have proposed different zirconia–

alumina composites for use in hip, knee, and shoulder joint replacements, with several other innovative devices also being under study. In addition, bioceramic composites with innovative compositions are under development and will be on the market in years to come. Something that is especially interesting is the application of bioceramic composites in the regeneration of bone tissues. Research has devoted special attention to the doping of well-known materials (i.e., calcium phosphates and silicates) with bioactive ions, aiming to enhance the osteogenic ability and bioresorbability of man-made grafts. Moreover, high expectations rely on hybrid biopolymer/ceramic materials that mimic the complex composition and multiscale structure of bone tissue.