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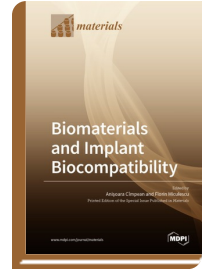
Biomaterials and Implant Biocompatibility

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The scientific advances in life sciences and engineering are constantly challenging, expanding, and redefining concepts related to the biocompatibility and safety of medical devices. New biomaterials, new products, and new testing regimes are being introduced to scientific research practices. In order to provide clinically predictive results and to ensure a high benefit–risk ratio for patients, we need to optimize material and implant characteristics, and to adapt performance and safety evaluation practices for these innovative medical devices. Various characteristics related to materials and implant development such as raw materials composition, implant surface morphology, design, geometry, porosity, and mechanical properties need to be thoroughly characterized before evaluating the biological performance of implants. Furthermore, with the increase of regulatory demands, biological evaluation needs to ensure appropriate models and methods for each implant development stage. This book is a result of the Special Issue of Materials on "Biomaterials and Implant Biocompatibility", which focused on the recent progress in development, material testing, and the biocompatibility and bioactivity evaluation of various materials including, but not limited to, bioceramics, biopolymers, biomaterials, composite materials, biomimetic materials, hybrid biomaterials, and drug/device combinations for implants and prostheses with medical applications spanning from soft to hard tissue regeneration. The book covers aspects ranging from investigations into material characterization to in vitro and in vivo testing for the assessment of biological performance of advanced, novel biomaterials and implants.



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