Biomaterials

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著者:Joyce Y. Wong

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For medical devices that must be placed inside the body, the right choice of material is the most important aspect of design. To ensure such devices are safe, reliable, economical, and biologically and physiologically compatible, the modern biomedical engineer must have a broad knowledge of currently available materials and the properties that affect their in-service performance. In chapters drawn from the third edition of the best-selling "Biomedical Engineering Handbook", "Biomaterials" surveys the wide variety of biomaterials in present use as well as materials resulting from novel micro- and nanoscale technologies.The book includes a general overview of bioinert, bioactive or surface reactive ceramics, and biodegradable or re-absorbable bioceramics. It reviews basic chemical and physical properties of the synthetic polymers, covers the sterilization of the polymeric biomaterials, discusses the importance of the surface treatment for improving biocompatibility, and examines the application of the chemogradient surface for the study on cell polymer interactions. The book also provides an overview of the chemistry design, fabrication, and application of biodegradable hydrogels for drug delivery and tissue engineering. It explores current issues involved in probing cell-biomaterials interactions on the molecular level and their implications for tissue engineering research and examines advances in biodegradable polymeric materials, soft and hard tissue replacements,

and applications in tissue engineering.Taking a focused look at the latest advances in biomaterials, the book discusses metallic, ceramic, polymeric, and composite biomaterials. With more than 100 figures and tables, as well as contributions from a panel of international experts, the book gives you familiarity with the uses of biomaterials in medicine and dentistry.

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