

<<纳米生物医学>>

图书基本信息

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内容概要

本书主要介绍了纳米生物医学研究领域的新进展。

本书分为三部分，第一部分叙述了纳米尺度的生物材料的设计、合成、特性以及应用，包括干细胞和相关技术、聚合物纳米纤维及其生物医学应用、自组织生物材料及其生物医学应用、生物探测材料的合成和自组织、磷酸盐陶瓷的生物领域的应用、生物材料的表面和界面特性、碳纳米管在生物传感方面的应用等；第二部分详细介绍纳米尺度的生物医学的新技术，包括药物输运技术、生物医学领域的微纳技术、DNA技术、纳米尺度的生物活性表面和移植、碳纳米管智能材料在生物和医学方面的应用等。

第三部分的重点是纳米材料合成和结构的最新进展，包括纳米材料中的声子行为、纳米粒子和纳米流体的合成和特性的最新进展等。

本书由工作在世界纳米生物医学领域的杰出科学家撰写。

本书的读者对象为相关专业高年级大学生、研究生、科技人员、工程技术人员。

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章节摘录

插图：Peptides provide an attractive profile of materials properties that make them unique building blocks for nanoscale materials。

Because aqueous self-assembly processes are employed in many materials applications of peptides, these materials tend to be sensitive to pH, ionic strength, temperature, and other factors from which stimulus-responsive strategies can be built. Moreover, peptide materials can be bioactive, particularly when their design mimics functional elements of native proteins. Additionally, being accessible synthetically, peptide materials are by nature easily tailored, and the materials from which they are built are likewise highly engineerable. This aspect arises from these materials' inherent modularity. 5.4.1 Stimulus-Responsiveness Given that many peptide-based materials are constructed through peptide folding and aqueous self-assembly, the factors that govern these processes are convenient triggers for rapidly altering the properties of these materials. Self-assembly mechanisms are covered in depth in this book in the chapter by Sui and Murphy entitled 'Nanoscale Mechanisms for Assembly of Biomaterials'. In particular, self-assembly is sensitive to pH, ionic strength, temperature, and CO₂ solvents. Stimulus-responsiveness is a useful

property that enables such applications as triggered release of drug payloads, injectable gels for minimally invasive surgery, or smart materials, where changes in the sensing environment trigger large scale changes in the properties of the material. Here we will provide a few examples of peptide-based materials that employ such strategies. For a more complete review of stimulus-responsive peptide-based biomaterials, see (Mart et al. 2006). In 13-sheet fibrils, many strategies for producing stimulus-sensitive materials have capitalized on the sensitivity of p-sheet fibril assembly to the presence of salts. As described in Sec. 5.3.1, p-sheet fibrillization is dramatically accelerated when salts are present in solution.

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