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Ablation; 2.3.3 Chemical Vapor Deposition as a Tool for Carbon Nanotube Production; 2.4 Controllable Synthesis of Carbon Nanotube Architectures; 2.4.1 Substrate-Site-Selective Growth; 2.4.2 Three-Dimensional Nanotube Architectures; 2.4.3 Super-Long SWNT Strands 2.5 Perspective on Biomedical Applications2.5.1 Imaging and Diagnostics; 2.5.2 Biosensors; 2.6 Conclusion; 3 Nanostructured Systems from Low-Dimensional Building Blocks; 3.1 Introduction; 3.2 Nanostructured System by Self-Assembly; 3.2.1 Nanoparticle Assemblies; 3.2.1.1 Role of Capping Molecules; 3.2.1.2 Multicomponent Assembly; 3.2.2 1D Nanostructure Assemblies; 3.3 Biomimetic and Biomolecular Recognition Assembly; 3.3.1 Assembly by Biomolecular Recognition; 3.3.1.1 DNA-Assisted Assembly; 3.3.1.2 Protein-Assisted Assemblies; 3.3.1.3 Virus-Assisted Assemblies 3.3.2 Biomimetic Assembly Process3.4 Template-Assisted Integration and Assembly; 3.4.1 Template-Assisted Self-Assembly; 3.4.1.1 Templating with Relief Structures; 3.4.1.2 Templating with Functionalized Patterned Surfaces; 3.4.2 Patterning of Nanoscale Component Assemblies; 3.5 External-Field-Induced Assembly; 3.5.1 Flow-Directed Assembly; 3.5.2 Electric-Field-Induced Assembly; 3.5.3 Electrophoretic Assembly; 3.5.4 Assembly Using Langmuir-Blodgett Techniques; 3.6 Direct Synthesis of 2D/3D Nanostructure; 3.6.1 Templated Synthesis; 3.6.1.1 Mesoporous Silica-Templated Synthesis 3.6.1.2 Direct Nanostructures Synthesis Using Soft Templates3.6.2 Direct Synthesis of Oriented 1D Nanostructure Arrays; 3.6.2.1 Oriented Arrays by Chemical Vapor Deposition; 3.6.2.2 Seeded Solution Growth; 3.7 Applications; 3.7.1 Chemical and Biological Sensing Applications; 3.7.1.1 Carbon-Nanotube-Based Sensing; 3.7.1.2 Semiconducting-Nanowire-Based Sensing; 3.7.1.3 Metallic-Nanowire-Based Sensing; 3.7.2 Other Applications of Integrated Nanoscale Component Assemblies; 3.8 Concluding Remarks; 4 Nanostructured Collagen Mimics in Tissue Engineering; 4.1 Introduction
4.2 Collagen Structural Hierarchy

Sommario/riassunto

This book focuses on the materials, synthetic methods, tools and techniques being developed in the nanoregime towards the life sciences -- in particular biology, biotechnology and medicine. Readers from materials science, engineering, chemistry, biology and medical backgrounds will find detailed accounts of the design and synthesis of nanomaterials and the tools and techniques involved in their production for applications in biology, biotechnology and medicine.