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Nota di contenuto	Nanomedicine Design of Particles, Sensors, Motors, Implants, Robots, and Devices; Contents; Preface; Chapter 1 A Nanotechnology Framework for Medical Innovation; 1.1 Introduction; 1.2 Descriptive Systems Modeling; 1.2.1 Examples of Descriptive Systems Modeling; 1.3 Instrumentation Needed to Develop DSM; 1.4 Nanomaterials Made for Medicine; 1.5 Implantable Nanomedical Devices; 1.6 Nanorobots; 1.6.1 Nanorobots for Revolutionizing Medicine; 1.6.2 Nanorobot Factory; 1.6.3 Biological Nanorobots; 1.7 Biodegradable Metals for Temporary Implantable Nanomedical Devices 1.8 Integration of Nanodevices in the Body1.9 Safety and Ethical Implications of Nanomedicine; 1.10 Efficiently Working Together Using Shared Resources; 1.11 Chapter Summary and Conclusions; Problems; Acknowledgments; References; Endnote; Part 1 Nanoscale Materials and Particles; Chapter 2 Synthesis of Carbon Nanotube Materials for Biomedical Applications; 2.1 Introduction to Nanoscale Materials; 2.2 Synthesis of Long Carbon Nanotube Arrays; 2.3 Characterization of

CNT Arrays; 2.3.1 Scanning Electron Microscopy and Transmission Electron Microscopy
2.3.2 Raman Spectroscopy and Thermal Gravimetric Analysis2.4 Patterned CNT Arrays; 2.5 Production Scale Up of CNT Arrays at UC; 2.5.1 Magnetron Sputtering for Substrate Preparation; 2.6 Spinning Carbon Nanotubes into Thread; 2.6.1 Mechanics of Array Spinning; 2.6.2 Direct Spinning of Thread from Long CNT Arrays; 2.6.3 Catalyst and Substrates for Growing of Spinable CNT Arrays; 2.6.4 Spinning Thread from DWCNT Arrays; 2.6.5 Pulling Ribbon from CNT Arrays; 2.6.6 Post-Treatment of the CNT Thread; 2.7 Mechanical and Electrical Characterization of CNT Thread; 2.7.1 Tensile Testing of CNT Thread 2.7.2 Electrical Properties of CNT Thread2.7.3 Temperature Dependence of the CNT Thread Resistance; 2.7.4 Electrical Properties of CNT Ribbon; 2.8 Nano-Handling of CNTs Using a Nanomanipulator Inside an ESEM; 2.8.1 Instrumentation; 2.8.2 Handling CNT Bundles; 2.8.3 Building Nanomedical Devices Using the Nanomanipulator; 2.9 Carbon Nanotube Threads in Wireless, Biomedical Sensor Applications; 2.9.1 Wireless Communication and the Modern World; 2.9.2 Development of CNT Thread-Based Antenna at UC; 2.9.3 Future Medical Application of the CNT Thread Antenna
2.10 Applications of CNT Materials in Nanomedicine2.10.1 Carbon Nanotube Array Immunosensor; 2.10.2 Carbon Nanotube Actuators; 2.10.3 Carbon Nanotube Materials as Scaffolds for Supporting Directional Neurite Growth; 2.11 Summary and Conclusions; Problems; Acknowledgments; References; Chapter 3 Functionalized Carbon Nanotubes as Multimodal Drug Delivery Systems for Targeted Cancer Therapy; 3.1 Introduction to Targeted Cancer Therapy; 3.1.1 Cancer Statistics; 3.1.2 Present-Day Cancer Treatment and Associated Problems; 3.1.3 A Brief Insight into Targeting Strategies
3.2 Carbon Nanotubes: A Versatile Material

Sommario/riassunto

Annotation This resource outlines the new tools that are becoming available in nanomedicine. The book presents an integrated set of perspectives that describe where advancements are now and where they should be headed to put nanomedicine devices into applications as quickly as possible.