

Fundamental Biomedical Technologies

Gabriel A. Silva
Vladimir Parpura *Editors*

Nanotechnology for Biology and Medicine

At the Building Block Level

 Springer

Contents

Part I Nanoscale Processes in Cells

Structure and Biology of the Cellular Environment: The Extracellular Matrix	3
Igor Titushkin, Shan Sun, and Michael Cho	

Part II Synthesis and Characterization Approaches

Synthesis and Patterning Methods for Nanostructures Useful for Biological Applications	27
Chiara Daraio and Sungho Jin	
Characterization of Nanoscale Biological Systems: Multimodal Atomic Force Microscopy for Nanoimaging, Nanomechanics, and Biomolecular Interactions.....	45
Arjan P. Quist and Ratnesh Lal	

Part III Nanobiotechnology: Biologically Inspired Nanoengineering and Their Applications

Molecular Motors and Machines.....	71
Serena Silvi and Alberto Credi	
Micro and Nano Engineered Extracellular Matrices	101
James J. Norman and Tejal A. Desai	
Designer Self-Assembling Peptide Nanofiber Scaffolds.....	123
Shuguang Zhang, Hidenori Yokoi, Fabrizio Gelain, and Akihiro Horii	

Part IV Nanomedicine: Nanotechnology for Diagnosis and Treatment

Quantum Dot Imaging of Neural Cells and Tissue	151
Tania Q. Vu and Sujata Sundara Rajan	
Quantum Dot Methods for Cellular Neuroimaging	169
Gabriel A. Silva	
Carbon Nanotubes as Electrical Interfaces to Neurons	187
Michele Giugliano, Luca Gambazzi, Laura Ballerini, Maurizio Prato, and Stephane Campidelli	
Carbon Nanotubes as Modulators of Neuronal Growth	209
Reno C. Reyes and Vladimir Parpura	
Index	225