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| Nota di contenuto | Layer-by-Layer Films for Biomedical Applications; Contents; Foreword; Preface; About the Editors; List of Contributors; Part I: Control of Cell/Film Interactions; Chapter 1 Controlling Cell Adhesion Using pH-Modified Polyelectrolyte Multilayer Films; 1.1 Introduction; 1.2 Influence of pH-Modified PEM Films on Cell Adhesion and Growth; 1.2.1 HEP/CHI Multilayers; 1.2.2 PEI/HEP Multilayers; 1.3 Summary and Outlook; Acknowledgments; References; Chapter 2 The Interplay of Surface and Bulk Properties of Polyelectrolyte Multilayers in Determining Cell Adhesion; 2.1 Surface Properties<br>2.2 Bulk ModulusReferences; Chapter 3 Photocrosslinked Polyelectrolyte Films of Controlled Stiffness to Direct Cell Behavior; 3.1 Introduction; 3.2 Elaboration of Homogeneous Films of Varying Rigidity; 3.3 Elaboration of Rigidity Patterns; 3.4 Behavior of Mammalian Cells on Homogeneous and Photopatterned Films; 3.5 |

Influence of Film Rigidity on Bacterial Behavior; 3.6 Conclusion; Acknowledgments; References; Chapter 4 Nanofilm Biomaterials: Dual Control of Mechanical and Bioactive Properties; 4.1 Introduction; 4.2 Surface Cross-Linking; 4.3 NP Templating; 4.4 Discussion; 4.5 Conclusions
AcknowledgmentsReferences; Chapter 5 Bioactive and Spatially Organized LbL Films; 5.1 Introduction; 5.2 Role of Chemical Properties; 5.2.1 Bulk Composition; 5.2.1.1 Introducing Natural Polyelectrolytes as Building Blocks; 5.2.1.2 Incorporating Hormones and Growth Factors; 5.2.2 Surface Chemistry; 5.2.2.1 Role of the Final Layer; 5.2.2.2 Surface Modification with Cell Binding Molecules; 5.3 Role of Physical Properties; 5.3.1 Mechanical Property; 5.3.1.1 Chemical Cross-linking; 5.3.1.2 Incorporating Stiff Building Blocks; 5.3.1.3 Control Environmental pH or Salt Concentration; 5.3.2 Topography
5.4 Spatially Organized PEMs5.4.1 Patterned PEMs; 5.4.2 Gradient PEMs; 5.5 Conclusions and Future Perspectives; Acknowledgments; References; Chapter 6 Controlling Stem Cell Adhesion, Proliferation, and Differentiation with Layer-by-Layer Films; 6.1 Introduction; 6.1.1 Types of Stem Cells; 6.1.2 Stem Cell Fate Choices; 6.1.3 The Stem Cell ``Niche''; 6.1.3.1 Soluble Factors; 6.1.3.2 Cell-Cell Interactions; 6.1.3.3 Cell-ECM Interactions; 6.1.4 Influencing Stem Cell Fate Choice; 6.2 Mesenchymal Stem Cells and Layer-by-Layer Films; 6.2.1 Human MSC Adhesion, Proliferation, and Differentiation
6.2.2 Murine MSC Adhesion, Proliferation, and Differentiation6.3 Pluripotent Stem Cells and Layer-by-Layer Films; 6.3.1 Murine ESC Adhesion, Proliferation, and Maintenance of Potency; 6.3.2 Murine ESC Differentiation; 6.3.3 Human ESC Adhesion, Proliferation, and Differentiation; 6.4 Future Directions and Trends; References; Part II: Delivery of Small Drugs, DNA and siRNA; Chapter 7 Engineering Layer-by-Layer Thin Films for Multiscale and Multidrug Delivery Applications; 7.1 Introduction; 7.1.1 The Promise of LbL Delivery; 7.1.1.1 High Drug Density and Scalability
7.1.1.2 Translatable to 2D and 3D Geometries

Sommario/riassunto

The book gives a thorough overview of applications of the layer-by-layer (LbL) technique in the context of bioengineering and biomedical engineering where the last years have witnessed tremendous progress. The first part familiarizes the reader with the specifics of cell-film interactions that need to be taken into account for a successful application of the LbL method in biological environments. The second part focuses on LbL-derived small drug delivery systems and antibacterial agents, and the third part covers nano- and microcapsules as drug carriers and biosensors. The fourth and last part