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Nota di contenuto	Surface Design: Applications in Bioscience and Nanotechnology; Foreword; Contents; List of Contributors; 1 Tutorial Reviews; 1.1 Coupling Chemistries for the Modification and Functionalization of Surfaces to Create Advanced Biointerfaces; 1.1.1 Introduction; 1.1.2 Surfaces and Self-Assembled Monolayers; 1.1.3 Reactions at Surfaces; 1.1.4 Coupling Chemistries; 1.1.4.1 Covalent Attachment Reactions; 1.1.4.2 Noncovalent Attachment Reactions; References; 1.2 Tutorial Review: Surface Plasmon Resonance-Based Biosensors; 1.2.1 Introduction; 1.2.2 Surface Plasmons 1.2.3 Optical Excitation of Surface Plasmons1.2.4 Implementation of SPR Biosensors; 1.2.5 Sensitivity of a SPR Biosensor to Biomolecular Binding; 1.2.6 Evaluation of Binding Affinity Constants; 1.2.7 Applications of SPR Biosensors; 1.2.8 Summary; References; 1.3 Tutorial Review: Surface Modification and Adhesion; 1.3.1 Introduction;

1.3.2 Chemical Methods of Adhesion Promotion; 1.3.3 Physicochemical Methods of Surface Modification; 1.3.3.1 Plasma-Assisted Surface Modification; 1.3.4 Analytical Tools to Study Adhesion; 1.3.5 Adhesion Failure - Longevity of Modification; 1.3.6 Summary
 References
 1.4 Tutorial Review: Modern Biological Sensors; 1.4.1 Analytical Concepts in Biosensor Design; 1.4.1.1 Units of Concentration; 1.4.1.2 Sensitivity; 1.4.1.3 Analyte Selectivity; 1.4.1.4 Limit of Detection (LoD); 1.4.2 Signal Amplification; 1.4.2.1 Signal Amplification by Increasing the Effective Analyte Concentration; 1.4.2.2 Signal Amplification by Assay Design; 1.4.2.3 Signal Amplification using High-Sensitivity Instrumentation; 1.4.3 Strategies for Attaching Functional Biomolecules to Surfaces; 1.4.3.1 Biotin-Streptavidin
 1.4.3.2 Direct Covalent Coupling of Biomolecules Using EDC-NHS
 1.4.3.3 His Tag; 1.4.3.4 Three-Dimensional Sensor Surface Structuring; 1.4.3.5 Brush Surfaces; 1.4.3.6 Specific Orientation of Bound Proteins; 1.4.4 Methods to Prevent Nonspecific Adsorption; 1.4.5 Analyte Recognition; 1.4.6 Overview of some Biosensing Strategies; 1.4.6.1 Bacterial and Viral Sensing; 1.4.6.2 Antibody 'Sandwich' Assay Sensing Platform for Detection of Group B Streptococcus Bacterium; 1.4.6.3 Biosensors for Detecting Viruses: Antibody Recognition and the HIV Test
 1.4.6.4 Biosensors for Detecting Enzymes: Sensors for Human Pregnancy Hormone
 1.4.6.5 Nucleic-Acid-Based Sensors; 1.4.6.6 Electrochemical Measurement of Blood Glucose; 1.4.7 Summary and Conclusions; References; 2 Functional Thin Film Architecture and Platforms Based on Polymers; 2.1 Controlled Block-Copolymer Thin-Film Architectures; 2.1.1 Introduction; 2.1.2 Results and Discussion; 2.1.2.1 Wetting Layer; 2.1.2.2 Ordering on Planar Substrates; 2.1.2.3 Ordering on Topographically Patterned Substrates; 2.1.3 Conclusions; 2.1.4 Experimental Section; References
 2.2 Stimuli-Responsive Polymer Brushes

Sommario/riassunto

This carefully selected balance of tutorial-like review chapters and advanced research covers hot topics in the field of biointerfaces, biosensing, nanoparticles at interfaces, and functionalized quantum dots. It also includes chapters arising from non-published work with topics such as surface design and their applications, as well as new developments in analytical tools for materials science and life science. Based on the very close and complementary collaboration of three distinguished leading research groups, this book highlights recent advances in the field ranging from synthesis and