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Nota di contenuto	Molecular Assembly of Biomimetic Systems; Contents; Preface; Introduction; Biomimetic Membranes; Layer-by-Layer Assembly of Biomimetic Microcapsules; FoF1-ATP Synthase-Based Active Biomimetic Systems; Kinesin-Microtubule-Driven Active Biomimetic Systems; Biomimetic Interface; Peptide-Based Biomimetic Materials; 1: Biomimetic Membranes; 1.1 Introduction; 1.2 Lipid Monolayers; 1.2.1 Phospholipid Monolayers at the Air/Water Interface; 1.2.2 Phospholipid Monolayers at the Oil/Water Interface; 1.2.3 Interfacial Behavior of Phospholipid Monolayers; 1.2.4 Protein Layers at the Oil/Water Interface 1.2.4.1 Kinetics of Protein Adsorption1.2.4.2 Formation of "Skin-Like" Protein Films on a Curved Interface; 1.2.5 Interfacial Behavior of

Phospholipid/Protein Composite Layers; 1.2.5.1 Dynamic Adsorption and Mechanism; 1.2.5.2 Assembly of "Skin-Like" Complex Films on a Curved Interface; 1.3 Modeling Membrane Hydrolysis In Vitro; 1.3.1 PLA2; 1.3.2 PLC; 1.3.3 PLD; 1.4 Polyelectrolyte-Supported Lipid Bilayers; 1.4.1 Polyelectrolyte Multilayers on Planar Surfaces; 1.4.2 Polyelectrolyte Multilayers on Curved Surfaces; 1.5 Conclusions and Perspectives; References

2: Layer-by-Layer Assembly of Biomimetic Microcapsules 2.1 Introduction; 2.2 Layer-by-layer Assembly of Polyelectrolyte Multilayer Microcapsules; 2.2.1 General Aspects; 2.2.2 Permeation and Mechanical Properties of LbL Microcapsules; 2.3 Biointerfacing Polyelectrolyte Microcapsules-A Multifunctional Cargo System; 2.3.1 Lipid Bilayer-Modified Polyelectrolyte Microcapsules; 2.3.2 Formation of Asymmetric Lipid Bilayers on the Surface of LbL-Assembled Capsules; 2.3.3 Assembly of Lipid Bilayers on Covalently LbL-Assembled Protein Capsules; 2.4 Application of Biomimetic Microcapsules 2.4.1 Integrating Specific Biofunctionality for Targeting 2.4.2 Adsorption of Antibodies on the Surface of Biomimetic Microcapsules; 2.5 Conclusions and Perspectives; References; 3: FoF1-ATP Synthase-Based Active Biomimetic Systems; 3.1 Introduction; 3.2 FoF1-ATPase-A Rotary Molecular Motor; 3.2.1 Structure of H<sup>+</sup>FoF1-ATPase; 3.2.2 Direct Observation of the Rotation of Single ATPase Molecules; 3.3 Reconstitution of FoF1-ATPase in Cellular Mimic Structures; 3.3.1 FoF1-ATPase-incorporated Liposome-A Classical Biomembrane Mimic; 3.3.1.1 Bacteriorhodopsin uses Light to Pump Protons 3.3.1.2 Proton Gradients Produced by Artificial Photosynthetic Reactions 3.3.2 ATP Biosynthesis from Biomimetic Microcapsules; 3.3.2.1 Generation of Proton Gradients in Polymer Capsules by the Change of pH Values; 3.3.2.2 Proton Gradients in Protein Capsules Supplied by the Oxidative Hydrolysis of Glucoses; 3.3.2.3 Proton Gradients Generated by GOD Capsules; 3.3.3 Reassembly of FoF1-ATPase in Polymersomes; 3.4 Conclusions and Perspectives; References; 4: Kinesin-Microtubule-Driven Active Biomimetic Systems; 4.1 Introduction; 4.2 Kinesin-Microtubule Active Transport Systems 4.3 Active Biomimetic Systems Based on the Kinesin-Microtubule Complex

## Sommario/riassunto

This handy reference details state-of-the-art preparation of molecular assemblies of biotechnologically relevant biomimetic systems (artificial proteins, peptides, molecular motors, photosensitive systems) with an emphasis on biomimetic membranes, capsules, and interfaces. Medical applications such as drug release, gene therapy, and tissue engineering as well as biosensing, biocatalysis, and energy storage are highlighted.