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Sinopsis

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In terms of structural complexity, the natural world presents innumerable examples of stunning beauty and high functionality, usually with the minimum of material and energy expenditure. Materials chemists can harness these amazing structures as ready-made scaffolds on which to grow inorganic phases which replicate the underlying complexity, thereby producing materials with greatly enhanced physical properties. This book comprehensively describes the entire range of natural materials that have been used in this way and the inorganic phases which result from them. The book covers simple molecules such as cellulose and chitin, to large biological constructs such as bacterial proteins, viruses and pollen. Practically every inorganic material has been synthesized using biotemplating methods and the book reflects this, ranging from simple oxides and carbonates such as silica and calcite, to complex semi- and superconducting materials. The book also discusses the formation of these materials from a mechanistic point of view, thereby enabling the reader to better understand the processes involved in biotemplated mineralization.

Contents:
Simple Mono- and Oligosaccharides
Complex Polysaccharides
Hydrocolloids
Chitin/Chitosan
Proteins and Lipids
Viruses and Bacteria
Complex Biostructures as Templates
Into the Future _ Genetic Engineering and Beyond